

EPA Standard of Performance for New Residential Wood Heaters

Certification Test Report

Non-Confidential Business Information (Non-CBI)

Manufacturer: Morsø Jernstøberi A/S
Heater Type: Wood-Fired, Freestanding Room Heater
Model: 2B Standard 2020

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AUTHORIZED SIGNATORIES

This report has been reviewed and approved by the following authorized signatories:

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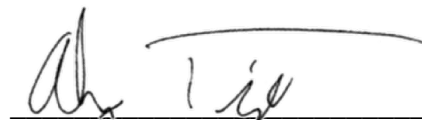

Alex Tiegs
President

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Section 1

Sampling Procedures and Test Results

INTRODUCTION

Morso Jernstøberi A/S retained *OMNI* to perform U.S. Environmental Protection Agency (EPA) third party certification on the 2B Standard 2020 freestanding room heater. The 2B Standard 2020 is a cast iron freestanding wood burning room heater. The firebox is constructed of cast iron. Usable firebox volume was measured to be 0.6925 cubic feet and the stove is vented through 6" flue collar located on the stove top.

Testing was performed at Danish Technological Institute (DTI) located at Kongsvangalle 29, DK-8000 Aarhus C, Denmark. Report number 300-ELAB-2472-EPA dated February 4, 2020 was generated by DTI and submitted to OMNI for review and third-party certification.

This report is organized in accordance with the EPA-recommended outline and is summarized in the Table of Contents immediately preceding this section. The results in this report are limited to the item submitted.

SAMPLING PROCEDURE

The 2B Standard 2020 was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters using EPA ASTM E2515 and E3053 *per* EPA Alt-125's requirements for cordwood testing. Particulate emissions were measured using sampling trains consisting of two Teflon coated 47mm filters (front and back).

The model 2B Standard 2020 was tested for thermal efficiency and carbon monoxide (CO) emissions in accordance with CSA B415.1-10 using Beech cordwood.

SUMMARY OF RESULTS

The weighted average emissions of the four test runs included in the results indicate a particulate emission rate of 0.55 grams per hour. Particulate emissions were sampled on two of the high burn fuel loads. The 2B Standard 2020 results are within the emission limit of 2.5 g/h for affected facilities tested with cordwood, manufactured on or after May 15, 2020.

The proportionality results for all 4 test runs were acceptable when calculated at a 10-minute sample rate. Quality check results for each test run are presented in appendix C of this report.

INDIVIDUAL RUN SUMMARIES

- Run 1 - HF** Test procedures followed to produce a high burn rate with a primary air setting of fully open. Observed burn rate was calculated at 1.89 kg/hr. Emissions results were calculated using particulate sampling from kindling, start-up fuel, and test fuel load combined (cold to hot). Burn rate, and efficiency were calculated using data from the test fuel load only (hot to hot). No sampling anomalies occurred; this test run was determined to be valid for inclusion in the weighted average.
- Run 2 - LF** Test procedures were followed to produce a medium burn rate with a primary air setting of full closed. A factory stop is installed to require minimum air setting of $\frac{3}{4}$ rotation of the spin draft from full closed. Observed burn rate was calculated at 0.48 kg/hr. Emissions and efficiency results were calculated using a hot to hot burn cycle, a coal bed generated by the high burn procedure was used. No sampling anomalies occurred; this test run was determined to be valid for inclusion in the weighted average.
- Run 3 - HF** Test procedures followed to produce a high burn rate with a primary air setting of fully open. Observed burn rate was calculated at 1.74 kg/hr. Emissions results were calculated using particulate sampling from kindling, start-up fuel, and test fuel load combined (cold to hot). Burn rate, and efficiency were calculated using data from the test fuel load only (hot to hot). No sampling anomalies occurred; this test run was determined to be valid for inclusion in the weighted average.
- Run 4 - MF** Test procedures were followed to produce a low burn rate with a primary air setting of one revolution on the spin draft from full closed. Observed burn rate was calculated at 0.66 kg/hr. Emissions and efficiency results were calculated using a hot to hot burn cycle, a coal bed generated by the high burn procedure was used. No sampling anomalies occurred; this test run was determined to be valid for inclusion in the weighted average.

Table 1 – Particulate Emissions

Run	Burn Rate Calculated from a Hot to Hot burn cycle (kg/hr dry)	ASTM E2515 Emissions (g/hr)	ASTM E3053 Weighting Factor (%)	ASTM E3053 Weighted Emissions (g/hr)
1	1.89	¹ 2.19	10	0.219
2	0.48	0.18	40	0.072
3	1.74	1.89	10	0.189
4	0.66	0.17	40	0.068

The sum of weighted particulate emission of 3 test runs: $0.219 + 0.072 + 0.189 + 0.068 = \mathbf{0.55 \text{ g/hr}}$.

1. Based on a cold start including kindling and start-up fuel.

Table 2 – Particulate Emissions (First Hour)

Run	ASTM E2515 Emissions – First Hour (g/hr)
1	2.39
2	1.07
3	2.44
4	0.52

Table 3 – B415.1 Efficiency and CO Emissions

Run	Heat Output (BTU/hr)	HHV Efficiency (%)	LHV Efficiency (%)	ASTM E3053 Weighted HHV Efficiency	CO Emissions (g/MJ Output)	CO Emissions (g/kg Dry Fuel)	CO Emissions (g/min)
1	25,299	74.7	80.0	7.47	1.03	14.5	0.46
2	6,959	81.7	87.5	32.68	2.69	41.3	0.33
3	23,190	74.1	79.4	7.41	1.12	15.6	0.46
4	9,615	81.5	87.3	32.6	2.09	32.0	0.35

Weighted average HHV efficiency of 4 tests: $7.47 + 32.68 + 7.41 + 32.60 = \mathbf{80.16 \%}$.

Average CO emissions: $(0.46 + 0.33 + 0.46 + 0.35)/4 = \mathbf{0.40 \text{ g/min}}$

Table 4 – Test Facility Conditions

Run	Room Temperature (°F)		Barometric Pressure (Hg)		Air Velocity (ft/min)	
	Before	After	Before	After	Before	After
1	70.7	71.4	30.12	30.00	<50	<50
2	71.8	70.0	30.29	30.23	<50	<50
3	70.3	71.6	30.19	30.19	<50	<50
4	73.4	70.3	30.19	30.08	<50	<50

Table 5 – Kindling and Start-up Fuel Description Summary

Run	Kindling Weight Wet Basis (lbs)	Start-up Fuel Weight Wet Basis (lbs)	Residual Start-up fuel weight (lbs)
1	1.28	1.80	0.77
3	1.28	1.79	0.77

Table 6 – Fuel Measurement and Cordwood Description Summary – TEST

Run	Test Fuel Wet Basis (lbs)	Firebox Volume (ft ³)	Fuel Loading Density Wet Basis (lbs/ft ³)	Test Fuel Dry Basis (lbs)	¹ Test Fuel Consumed During Test Dry Basis (lbs)
1	6.93	0.69	10.0	5.78 + 2.65	6.99 ¹
2	8.15	0.69	11.77	6.73	6.73
3	6.96	0.69	10.0	5.79 + 2.65	7.01 ¹
4	8.50	0.69	12.27	7.08	7.08

1. Includes start-up and kindling fuel for high burn tests 1, 3

Table 7 – Dilution Tunnel Gas Measurements and Sampling Data Summary

Run	Length of Test (hh:mm:ss)	Average Dilution Tunnel Gas Measurements	
		Velocity (ft/sec)	Temperature (°F)
1	1:40:03	22.408	96.5
2	6:24:09	21.752	79.2
3	1:46:22	22.178	95.4
4	4:52:03	21.916	81.6

*Morsø Jernstøberi A/S.
Model: 2B Standard 2020
Report Number: 0192WS025E*

Appendix A

User Manual / Labels

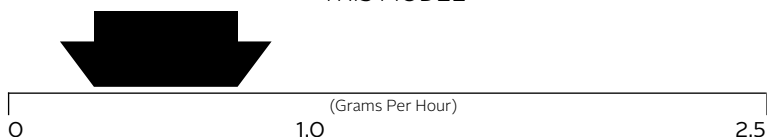
Manufactured by: Morsø
Model: 2B Standard 2020

U.S. ENVIRONMENTAL PROTECTION AGENCY

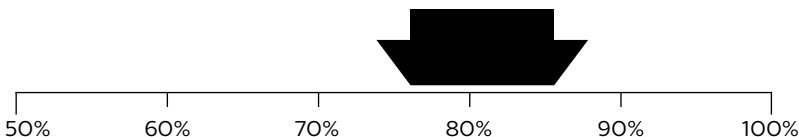
Certified to comply with 2020 particulate emission standards using cord wood.

SMOKE

THIS MODEL



EFFICIENCY



Particulate emission using ASTM E3053-17 cordwood test method:

Emission
0.55 g/h

Wood heaters with higher efficiencies cost less to operate.

HEAT OUTPUT
6,959 to 25,299 Btu/Hr

Use this to choose the right size appliance for your needs.
ASK DEALER FOR HELP

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

morsø



By appointment to The Royal Danish Court

morsø

Installation and Operating Instructions

Morsø 2B Standard

For use in North America



Save these instructions

MORSØ JERNSTØBERI A/S · DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Enjoy your new Morsø stove!

We congratulate you on your choice of a Morsø stove. Morsø has been producing some of the world's best stoves since 1853. If you follow this installation- and operating instruction carefully, we can assure you many years of warmth and pleasure.

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Read this entire manual before you install and use your new room heater. If this room heater is not properly installed, a house fire may result. To reduce the risk of fire, follow the installation instructions. Failure to follow instructions may result in property damage, bodily injury, or even death.

Contact local building officials about restrictions and installation inspection requirements in your area.

Save these instructions

Optional Accessories

A wide range of accessories (such as handling gloves, fireside tools, glass cleaner and heat-proof paint) are available for use with your Morsø stove. They help with day-to-day running and maintenance. Contact your Morsø dealer for more information.

The Morsø 2B Standard 2020 have been tested by OMNI-Test Laboratories, Inc. The test standards are UL-1482-2012 (R2015) for the United States and ULC-S627-00 for Canada.



The stove is listed for burning wood only. Do not burn other fuels.

U.S. ENVIRONMENTAL PROTECTION AGENCY. Certified to comply with 2020 particulate emission standards using cord wood.

Average particulate emission using ASTM E3053-17 cord wood test method is 0.55 g/h. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 6,959 to 25,299 Btu/hr. This appliance was determined to have an average higher heating efficiency value of 80.2% when tested in accordance with CSA B415.1

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.



Cast iron

Cast iron is a live material. There are no two ovens that are identical. This is partly due to the tolerances of the casting process, partly because the ovens are a work of craftsmanship. Minor unevennesses may also occur in the cast iron surface.

1.0 Installation of your Morsø stove

Installation of woodburning stoves must be safe and legal.

If your Morsø stove is not installed correctly, it may cause a house fire. To reduce the risk of fire, the installation instructions must be followed carefully. Contact the local building officials about restrictions and installation inspection in your area.

Before you start installing your stove, make sure that:

- The stove and chimney connection are placed far enough from combustible materials to meet all clearance requirements.
- The floor protection must be adequate and must be made correctly according to the requirements.

All necessary approvals are needed from the local building officials.

The data plate, which is located on the back of the stove, provides information regarding safety testing information, name of certified testing laboratory, and installation requirements.

Installation requirements vary in different districts, and the local building officials have the final authorization to approve your installation. You should discuss the installation with them before beginning. Please ask your dealer for further information.

Do not connect to any air distribution duct or system.

Important: If the installation instructions are not followed carefully, it may cause dangerous situations like chimney - and house fires. Follow the instructions carefully and do not deviate from them as it may cause injuries to people or property.

1.1 Unpacking the stove

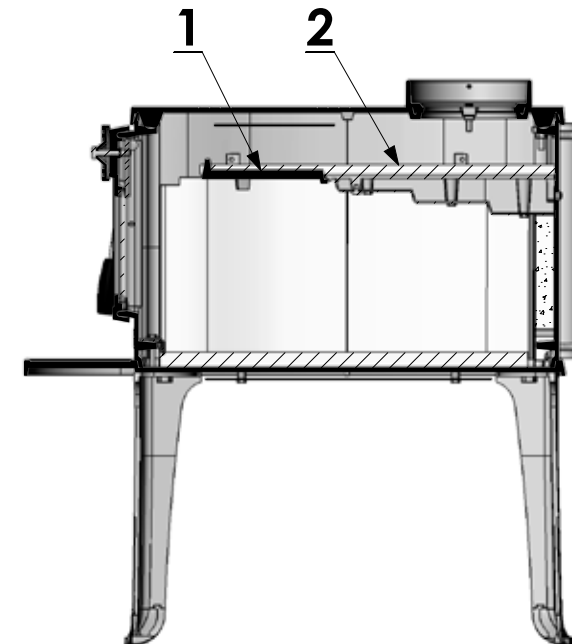
2B Standard: After removing the outer packaging, flatten it and lay onto the floor close to the stove; this can then act as protective work surface during the assembly process.

Next, remove the legs and bolts from inside the stove. Gently lay the stove onto its back and unscrew it from the wooden pallet. Using the bolts supplied, now screw the legs into position on the underside of the base. The stove should now be lifted and moved into the upright position, avoiding excess load on the back legs. Do not use the bolts used for securing the fire chamber to the wooden pallet.

1.2 Checking loose parts in the stove

After unpacking, check that the fire bricks are firmly in position and have not shifted in transit. Check also that the air control works freely.

Before starting the initial fire, make sure that the baffle (1) and insulation (2) over the baffle are placed correctly, as shown on the images below.



How to fit the Vertical Baffle

Lead the vertical baffle through the door as shown below (picture 1 & 2). Place the baffle into the right position (picture 3 & 4). The baffle insulation is placed on the baffle.



Standard Accessories

A Morsø glove and ceramic flue connection gasket are standard accessories that usually can be found in the ashpan or firebox area.

1.3 The chimney / flue system

Note that the flue system must be independently secured and must not rely on the stove for support.

The stove must not be connected to a chimney flue serving any other appliance. (Several flues may run up a single chimney stack; use one flueway per appliance).

Use a residential type masonry or listed type HT factory-built chimney.

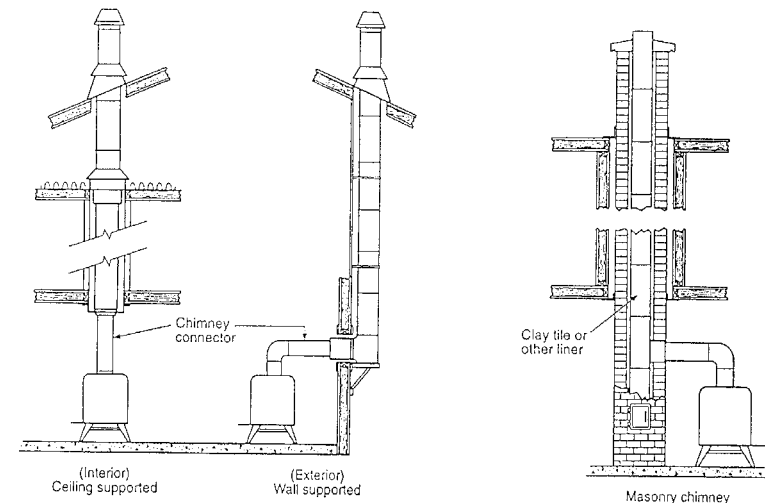
High Temperature (H.T.) Chimney Standard UL-103-1985 (2100° F.) or a code-approved masonry chimney with flue liner for the USA, and High Temperature (650°C) Standard ULC S-629 for Canada.

The internal dimensions of the chimney connector and chimney must not be less than 6 inches diameter (or equivalent cross section), and should not be significantly larger than this. Too large a section will tend to allow the flue gases to cool excessively, causing sluggishness or unpredictability in the stove's performance.

We recommend the length of the chimney system should be at least 16 feet (not required) above the stove in normal domestic situations, measured from the flue collar to the top of the chimney.

Local conditions like for example - roof constructions, large trees nearby and high altitude, may influence the chimney draft and height. Therefore, contact the local professional chimney sweep or your Morsø dealer.

Typical Factory-Built or Masonry Chimney Installations



1.4 Flue Connection

A flue collar is placed in the firebox area.

Use a 24 MSG black or blue chimney connector or listed double wall chimney connector. Refer to local codes and the chimney manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. Remember to secure the chimney connector with a minimum of three screws to the product and to each adjoining section. Position the stove and connect to the flue system.

Wear gloves and protective eyewear when drilling, cutting or joining sections of chimney connector.

1.5 Connection to the existing chimney

A chimney connector is the double-wall or single-wall pipe that connects the stove to the chimney. The chimney itself is the masonry or prefabricated structure that encloses the flue. Chimney connectors are used only to connect the stove to the chimney.

Double-wall connectors must be tested and listed for use with solid-fuel burning appliances. Single-wall connectors should be made of 24 gauge or heavier gauge steel. Do not use galvanized connector; it cannot withstand the high-temperatures that smoke and exhaust gases can reach, and may release toxic fumes under high heat. The connector must be 6 inches (150mm) in diameter.

If possible, do not pass the chimney connector through a combustible wall or ceiling. If passage through a combustible wall is unavoidable, refer to the sections on Wall Pass-Throughs. Do not pass the connector through an attic, a closet or similar concealed space when installing the chimney connectors.

It is important to keep the flue gases moving smoothly in the right direction. Do not vent into a large void at this location; rather form one continuous section all the way up. Use mild bends (e.g. 45° vs. 90°) rather than sharp angles where a change of direction is required. All parts of the venting must be accessible for cleaning purposes.

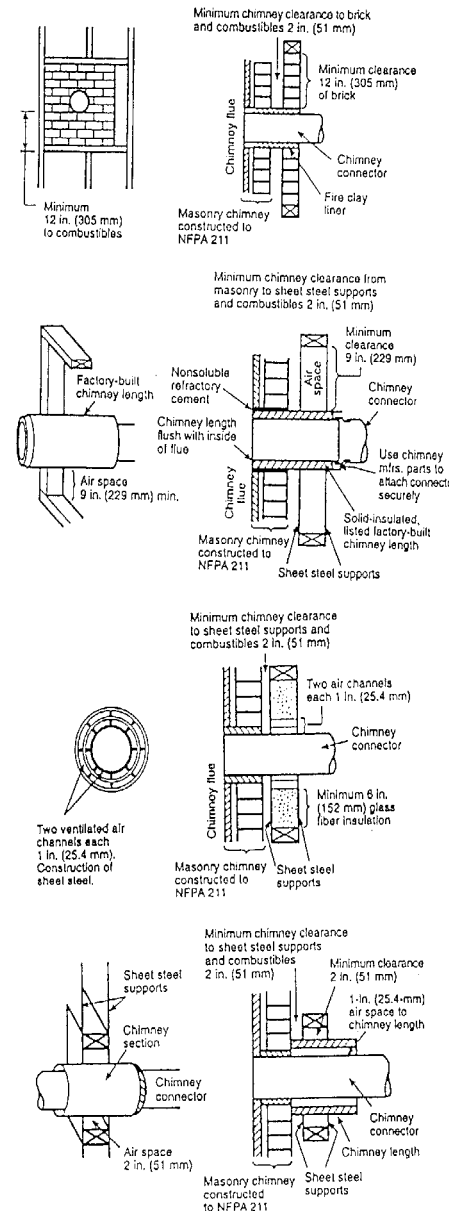
In horizontal runs of chimney, maintain a distance of 18 inches from the ceiling. Keep it as short and direct as possible, with no more than two 90 degree turns. Slope horizontal runs of connector upward 1/4 inch per foot (20 mm per metre) going from the stove toward the chimney. The recommended maximum length of a horizontal run is 3 feet (1 metre), and the total length should be no longer than 8 feet (2.5 metres).

Information on assembling and installing connectors is provided by the manufacturer's instructions exactly as you assemble the connector and attach it to the stove and chimney.

Be sure the installed stove and chimney connector are correct distances from near by combustible materials. See the clearance paragraph page 11.

Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365.

Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



- A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.
- B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.
- C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.
- D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

1.6 Positioning the stove

Distance to walls and lintel

When the stove is positioned near combustible materials, observe all current local and national building regulations with regards to clearances. Whatever regulations apply to your area, do not in any case install the stove within 8 inches of combustible materials around the sides or 16 inches above the top of the stove (fireplace installations require greater clearances above the stove - see below in the clearance chart). These distances may need to be increased if the materials are sensitive to heat. Note also that wall paper and other decorative materials may become detached with the effects of heat and care should be taken to ensure that they do not fall towards the stove in such an event.

When the stove is positioned near non-combustible materials, a gap of 4 inches or more is recommended for cleaning purposes and to ensure that heat circulates around the stove and out into the room.

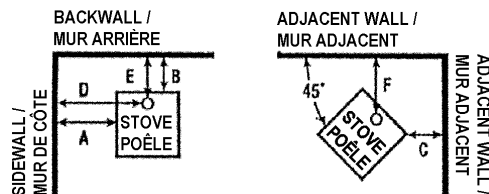
Clearance requirements for 2B Standard without shields (Singlewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (SINGLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	26"	26" (660 mm)
B. Backwall to unit	16"	16" (406 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	29"	29" (737 mm)
E. Backwall to connector	18"	18" (457 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

Clearance requirements for 2B Standard with Convection shields (Singlewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (SINGLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	26"	26" (660 mm)
B. Backwall to unit	16"	16" (406 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	26"	26" (606 mm)
E. Backwall to connector	23"	23" (583 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

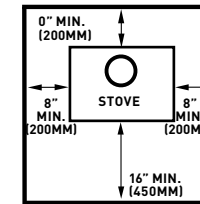
MINIMUM CLEARANCES TO COMBUSTIBLES:
DEGAGEMENTS MINIMAUX AUX MATERIAUX COMBUSTIBLES:



Clearance requirements for 2B Standard with & without shields (Doublewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (DOUBLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	20"	20" (508 mm)
B. Backwall to unit	12"	12" (305 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	26"	26" (660 mm)
E. Backwall to connector	14"	14" (356 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

FLOOR PROTECTION REQUIREMENTS



FLOOR PROTECTOR MUST BE NON-COMBUSTIBLE MATERIAL. IT MUST EXTEND BENEATH HEATER, AND TO THE FRONT / SIDES / REAR AS INDICATED

Floor protection requirements	Non-combustible materials beneath stove	
	USA	Canada
A. Extending distance, back	-	200 mm
B. Extending distance, right side	6"	200 mm
C. Extending distance, left side	6"	200 mm
D. Extending distance, front	16"	450 mm

In the US, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 16" to the front and 8" to the sides of the fuel loading door and ash removal openings. In Canada, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 450 mm.(16") to any side with a door and 200 mm.(8") beyond the appliance on the other sides.

Distance to furniture

The recommended minimum distance from stove to furniture is 30 inches. Note that some furniture is more easily affected by heat and may need to be moved to a greater distance. This is your responsibility.

In addition other combustible materials, away from the stove. In general, a distance of 30 inches must be maintained between the stove and moveable combustible item such as drying clothes, newspapers, firewood etc.

DO NOT INSTALL IN A MOBILE HOME

Note:

Acid Protection

If acid-washing the masonry around the stove, protect the stove surface with an acid-proof cover.

Fresh Air Inlet

Unless there is deemed to be sufficient ambient leakage of air into the room via doorways, windows and the like, a dedicated fresh air inlet will be needed. This inlet should have 2 square inches (1250 square mm) of free air space. This is particularly important where the room is well sealed, or where an extractor hood or ventilation system disturbs the natural air pressure. Such an inlet should not be on a wall that is usually subject to negative pressure from normal wind pattern. Avoid placing the inlet directly across the room from the stove, thus causing a cold air draft.

2.0 Operation

2.1 Before you start firing

For use with solid wood fuel only. Do not overfire, if heater or chimney connector glows you are overfiring. Inspect and clean chimney frequently. Under certain conditions of use creosote buildup may occur rapidly. Because of risk of smoke and flame spillage, operate only with door fully closed.

CAUTION:

Hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.

DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE

DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS

DO NOT USE A GRATE, ANDIRONS, OR OTHER WAYS OF ELEVATING THE FIRE - BUILD FIRE DIRECTLY ON HEARTH.

DO NOT USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER OR FLUID OR SIMILAR LIQUIDS TO START OR FRESHEN UP A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS AWAY FROM THE HEATER WHILE IT IS IN USE

Choosing your fuel

All types of natural wood can be burned on your stove, but they must be well-seasoned and dry. Once the wood is cut to length, it should be split down middle - to suit the dimensions given below - to allow moisture to evaporate. Cut the wood to a length of max 12 inches (30 cm) and approx. 3 to 3,5 inches (7-8 cm) in section. If you can weigh your wood, aim for around 2 lbs. For correct combustion and heat output, wood fuel should contain no more than 20% moisture; this can easily be checked by using the Morsø Moisture Meter (part # 62929900).

To naturally season wood fuel, stack and store it under cover in an airy location where fresh air can move through each piece. Some soft woods may take as little as one good summer to season whereas harder woods such as oak, maple, and elm may require seasoning up to 18 months. Avoid overly dry wood that is gray in color as under certain conditions it can cause performance problems, such as back-puffing and sluggishness. Well seasoned wood will be light to hold and will show signs of cracking from the center-out in the ends. If your wood spits or sizzles when burnt, and your stove's door glass persistently mists up, your wood is not properly seasoned. Never use drift wood (from the sea), whose salt content may cause corrosion, nor construction wood that may have been impregnated with chemicals.

To optimize efficiency:

Burning wet wood has a negative impact on efficiency

CAUTION Do not place fuel within the installation clearances for the stove or within the space required for loading fuel and ash removal.

Starting the First Fire

The initial fire should be small, so that the stove paint can cure and the main plates of the stove can settle into position. Some fumes will be given off by the paint. Ventilate the room during this phase.

The setting of the air control, lighting techniques and loading intervals will depend on chimney draft, the fuel used, the heat required and so on. Some basic techniques are outlined below.

In principle

Your stove is fitted with Primary and Secondary air inlets. Primary Air is controlled using the spinner on the door. Open the spinner will allow a supply of preheated air to enter the firebox via the 'airwash' system situated inside the stove and above the glass.

The secondary air is injected into the flue gases above the fire resulting in a cleaner, more efficient combustion process. The supply of secondary air is fixed open and is not adjustable.

For extra safety, your stove has been fitted with a removable handle on the frontdoor.

2.2 Lighting and loading intervals

When first lighting the stove, a large volume of air is needed. When the stove is cold, you should leave the door open an inch or two for the first few minutes and open the primary air supply completely. While the door is open, do not leave the stove unattended.

To form a reasonable bed of ash on the floor of the stove, you should use 2-4 pounds of dry kindling at the initial lighting. If possible, maintain a 1-1.5 inch (2-3 cm) layer of ash on the floor of the combustion chamber for added insulation.

1. We recommend using the "top-down" method to light your wood-burning stove. It is the most environmentally-friendly method of lighting. Use two firelighters and approx. 2-4 lbs of dry kindling sticks to quickly create a glowing layer of wood. Place the firelighters directly under the top layer of kindling sticks. This minimizes soot formation on the glass. Soot formation on the glass is often caused by too vigorous burning in contact with cold surfaces. If you avoid the formation of soot when lighting the fire and build up a layer of hot embers, you will have minimal soot formation when getting the fire burning again later.



2. The air supply must be fully open.

3. Light the fire.



4. After lighting, partially close the door, leaving it open an inch or two to allow in plenty of combustion air.

4. When the chimney is warm after about 5-10 minutes, the frontdoor should be closed. A suitable layer of ember will be formed after about 15-20 minutes.



5. When ready to reload, use a poker to spread the ember across the firebox floor, bringing plenty towards the front of the stove.



6. Refuelling of your stove should be done while there are still glowing embers in the bed. Spread the embers across the bottom, but concentrated mostly towards the front of the stove. We recommend using fuel load with a weight of 4 lbs (2 pieces) and up to 7 lbs (5 pieces).

Always keep the fuel load beneath the lowest secondary air nozzles. The space in front of and above the lowest air nozzles is reserved for volatile gas combustion only.

When refuelling your stove, it is recommended that you open the stove door gently for the first 1-2", then wait for a few seconds for the pressure in the flue to equalise; you are now safe to proceed and open it all the way. By using this technique smoke spillage can be eliminated particularly in poor chimney draft conditions. The stove door should not be opened when the stove is being fired vigorously.



7. Close the frontdoor. Leave the primary air supply fully open. The new fuel will ignite in a minute or two

8. After a few minutes, adjust the primary air supply to suit your heating requirements.

9. For refueling, add a layer of wood while there are still plenty of live embers, Repeat steps 5-8.



This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

Warning: Fireplace stoves must never be left unattended with the door open. If the door is left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke. We recommend that you fit a smoke detector in the room where the stove is installed.

DO NOT OVERFIRE THIS HEATER. Overfiring may cause a house fire, or can result in permanent damage to the stove. If any part of the stove glows, you are overfiring.

The maximum recommended weight of wood fuel per load is 3,5 kg/7 lbs (approx 5 split logs).

Under normal firing, the average flue temperature in the stove pipe, measured 20 cm above the stove, is approx. 300° C (550°F). The maximum flue temperature in the stove pipe must not exceed 450° C (750°F). If the flue temperature exceeds 450° C (750°F), it is considered as over firing and may cause premature wear and tear of the stove.

To help gauge the correct running temperature of your stove, we recommend you use the Morsø Flue Gas Thermometer (part No. 62901200). The Flue Gas Thermometer magnetically attaches onto the stove pipe approx 20 cm (8") above the stove's top plate and measures the surface temperature of the stove pipe. Please see your authorized Morsø Dealer for availability.

Draft conditions

If smoke or fumes come out of your stove when lighting up and reloading, or if the fire simply will not respond, a poor draft is almost certainly to blame. (In a very few cases, there may be insufficient fresh air getting into the room - see installation advice above). Take advice from your stove supplier on how best to upgrade your flue system to improve draft.

Rules of woodburning

If you want less heat, put fewer logs on the stove and reduce the amount of air. It is still important to maintain a good layer of embers.

Less heat - less wood - less air

Greater heat - more wood - more air

Soot deposits will settle on the glass if the stove is run too slowly or if your wood is not well seasoned.

Carbon monoxide detectors

It is required in some jurisdictions to install smoke and carbon monoxide detectors where heaters are installed. Install at least one smoke detector on each floor of your home to ensure your safety. It should be located away from the wood appliance and close to the sleeping areas. Locating a smoke detector too close to a wood appliance can cause the smoke detector alarm to sound if a puff of smoke is emitted while the wood appliance door is open during reloading. Follow the smoke detector manufacturers placement, installation, and maintenance instructions

3.0 Maintenance

When performing maintenance on your stove, always protect yourself, using safety goggles and gloves

3.1 Exterior Maintenance

The stove surface is painted with heat-resistant Senotherm paint. It is best kept clean by vacuuming with a soft brush attachment or by wiping with a lint-free cloth.

Over a period of time, the painted surface may become slightly grey. A can of Morsø touch-up spray paint should be available from your stove supplier. This can be applied - in accordance with the instructions - in just a few minutes. When first firing after touching up, the stove will give off a slight smell as the paint cures. Make sure to ventilate the room well during this phase.

3.2 Internal maintenance

Glass

If the stove is generally run at the correct temperatures, there should be little or no dirt on the glass. If dirt does settle during lighting, most will burn off as temperatures increase. For heavier deposits that will not burn off, use Morsø glass cleaner, applied when the glass is cold, in accordance with the instructions. Never use abrasive cleaners on the glass surface.

Reasons for dirty glass

- Fuel too wet
- Logs too large or not split
- Combustion temperatures too low

Do not clean the glass while hot

Replace broken glass immediately.

Do not operate your stove if the glass in the door is damaged.

If you need to replace the glass, it should be replaced with the high temperature ceramic glass supplied by Morsø, contact your Morsø dealer.

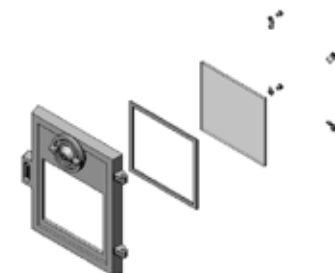
Installing the glass

Never install the glass when the stove is in function.

Ceramic glass replacement

Ceramic glass cannot be recycled because it has a higher melting point than ordinary glass. If ceramic glass is mixed with ordinary glass, the raw material is spoiled, and the reclaiming process may be halted. Take care that the ovenproof glass does not end up among ordinary recycled waste. That will be a great benefit to the environment.

Note: Should be handed in to a recycling station as ceramic glass.



1. Lift the door off the hinges and place it face down on a sheet of cardboard or other non-abrasive fabric.
2. Unscrew the 4 bolts that secure the glass. (In the event that a bolt sheers off when being unscrewed, remove the remaining body of the bolt by drilling down its centre with 1/8 inch high speed steel drill bit. Smaller drill bits may be successful, but do not use a larger bit. Make sure the bit stays away from the edges of the bolt - this may damage the thread in the cast iron).
3. Remove the old ceramic gaskets and clean up the surface underneath with wire wool or emery paper to remove loose particles.
4. Place the new gasket material in position around the perimeter of the window area, making sure to pinch them to the length in such a way that they make a continuous seal. Leave no gaps.
5. Place the new glass in position on the strips and screw home the fresh bolts and fitting by hand.
6. Finally, give each of the bolts an extra half turn or so. The glass should held tight enough by that cleaning will not dislodge it. Do not over-tighten the bolts as this may put excessive pressure on the glass, resulting in cracking - important!

To reduce the risk of breaking the glass, avoid striking the glass or slamming the door.

Internal service parts

The flame-path equipment - consisting of the ashpan, grate, firebricks, Cast iron fire plates, glass, baffle and flue collar - are subject to the extremes of heat produced by the fire. From time to time, one or other of these parts may need replacing as a matter of routine maintenance.

Stone replacement

When replacing the stones, unscrew at the rear of the stove the heat reflector, which is mounted with 4 screws. This provides access to the 2 bolts that hold the smoke baffle in place. Remove these bolts so that the smoke baffle inside the stove can be raised. Raise the smoke baffle so that the old stones can be removed from the stove and the new ones can be installed. The side stones are placed in the grooves in the vermiculite bottom plate. Once the stones have been properly put into place, lower the smoke baffle down onto the stones and re-bolt it securely to the cast rear of the stove. Finally, reinstall the rear heat reflector with its 4 screws.

NOTE: The flame-path equipment, the ceramic rope and the paint finish are not covered by guarantee.

All of these service parts can be bought from your Morsø dealer, and we recommend that damaged parts are replaced as soon as possible to avoid collateral damage. Should the baffle be distorted by an overfire, the stove will still function, although its efficiency may be compromised. Replace it as soon as possible.

Reasons for fast internal wear and tear

- Persistent heavy firing
- Soot and ashes left to accumulate

Gasket

The gasket around the perimeter of the door may harden over a period of time. It should be replaced if it becomes difficult to close the doors or if air starts to leak in around the perimeter of the doors, causing the fire to become a little less controllable. A Morsø rope gasket kit is available from your stove supplier.

3.3 Cleaning the Stove and the Flue

Check for soot above the baffle plate and around the flue outlet every month or so to start with. If the stove suddenly becomes sluggish, check for a soot fall around the flue collar or in the flue/chimney.

The chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Clean the flue/chimney - all the way from the stove to the flue terminal point above the house. A good routine is to clean the flue after each heating season in any case, and inspect prior to the season to ensure that bird's nests or other blockages have not occurred during the off season.

Ash disposal

Empty the ashpan on a daily basis or as needed. Ash allowed to build up towards the underside of the grate will trap heat and could cause premature failure of the grate.

Empty the ashpan according to this procedure:

Open the front door, and use a shovel.

Dispose the ash in a metal container with a tight fitting lid.

The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Caution:

Never empty a stove in operation.

Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

Creosote - formation and need for removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. When burning wood, the chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Chimney sweeping

Inspect the system regularly during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.

Clean the chimney using a brush the same size and shape as the flue liner. Run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.

Clean the chimney connector disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Morsø Dealer or a professional chimney sweep.

If you do experience a chimney fire, act promptly and:

1. Close the air control.
2. Get everyone out of the house.
3. Call the Fire Department.

Annual maintenance

Before the heating season, perform a thorough cleaning, inspection and repair: Thoroughly clean the chimney and chimney connector.

Inspect the chimney for damage and deterioration. Replace weak sections of prefabricated chimney. Have a mason make repairs to a masonry chimney.

Inspect the chimney connector and replace any damaged sections.

Check gasketing for wear or compression, and replace if necessary.

Check the glass for cracking; replace if needed.

Check door and handle for tightness. Adjust if needed.

ALWAYS USE ORIGINAL MORSØ SPAREPARTS

3.4 Leaving the stove for extended periods

Important:

If the stove is to be left unused for any period of time, clean it out thoroughly and leave the air control slightly open to allow airflow. Make sure that the flue does not allow rainwater to come anywhere near the stove; install a chimney cap, but do not block off the flue completely.

These measures should ensure there is a slight movement of air through the stove, and that the body of the stove remains dry, right into the corners.

Any ash left within an unfired stove can attract moisture like blotting paper. If moisture is allowed to settle within the stove, rust will form. Rust expands as it takes a grip. This can lead to undue pressure on the stove joints, and this in turn may result in damage to the stove.

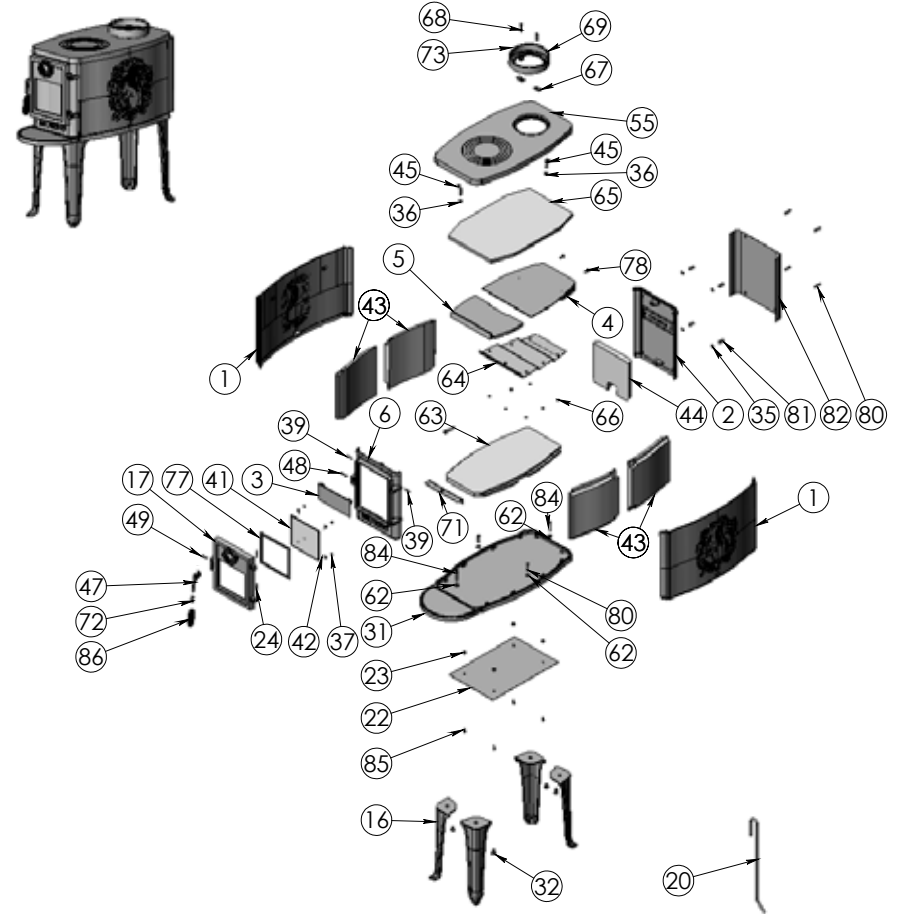
NOTE: It is best to thoroughly clean the stove after the heating season has concluded. Adding a dessicant, such as kitter litter, into the ash pan helps absorb moisture during the summer months. Be sure to remove this prior to the heating season.

Thank you for buying a morsø stove.

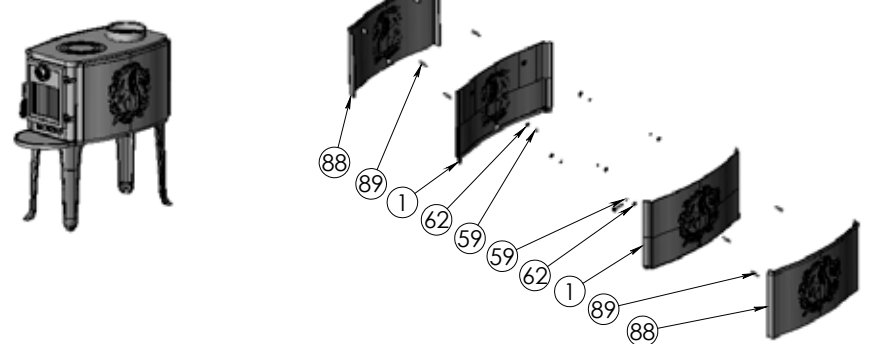
We hope you have many years of carefree warmth in its company. Some initial experimentation with loading and running techniques will decide your normal routine. If you have any problems after this short learning phase, please refer to your stove dealer. Should they be unable to help for any reason, please contact us in writing at the address on the front of this publication.

3.5 Parts diagram for model Morsø 2B Standard

2B Standard Radiant



2B Standard Convection



3.6 Parts list for model Morsø 2B Standard

Pos. No.	Parts	2B Standard without shields	2B Standard with convection shields
1	Squirrel side panel	54200321	44200521
2	Rear plate	44203721	44203721
3	Smoke valve	44200800	44200800
4	Horizontal baffle	44203600	44203600
5	Vertical baffle	34203800	34203800
6	Front	44201521	44201521
16	Leg	44200121	44200121
17	Door	44204421	44204421
20	Poker	541075	541075
22	Radiation shield - base	54137000	54137000
23	Distance tube	541439	541439
24	Hinge pin	541808	541808
31	Base	44204021	44204021
32	Screw	-	-
35	Washer	-	-
36	Screw	-	-
37	Screw	-	-
39	Screw	-	-
41	Door glass	790715	790715
42	Glass clips	790743	790743
43	Side brick	79209000	79209000
44	Rear brick	79209100	79209100
45	Bolt	-	-
47	Clasp	79127000	79127000
48	Pin	791868	791868
49	Pin	791869	791869
55	Top plate	44200721	44200721
59	Nut	-	-
62	Washer	-	-
63	Brick - base	79209300	79209300
64	Baffle - stainless steel	71209061	71209061
65	Insulation	79077100	79077100
66	Screw	-	-
67	Fitting for cover w. thread	44256700	44256700
68	Screw	-	-
69	Flue collar	44145921	44145921
71	Radiation shield - front	71209161	71209161
72	Fitting for handle	75140161	75140161
73	Screw	-	-
77	Tightning tape for glass	79074200	79074200
78	Screw	-	-
80	Screw	-	-
81	Distance tube	542635	542635
82	Conv. back rear plate	54201221	54201221
84	Screw	-	-
85	Screw	-	-
86	Bakelite handle 36 mm	79118300	79118300
87	Washer	-	-
88	Konv. Squirrel side panel	-	44204121
89	Screw	-	-

Guarantee Product Registration

MORSØ 10 YEAR GUARANTEE CERTIFICATE

Behind every Morsø stove is more than 160 years of dedicated stove design and manufacturing experience. Quality control has always been at the heart of the production process and detailed measures have been put into place at all key stages of the build. Accordingly, provided that the stove has been supplied by an authorised Morsø dealer, Morsø will offer a 10-Year Manufacturers Guarantee against manufacturing defect to any of the main exterior body parts of its stoves.

Read more about "Morsø 10 years guarantee/product registration card" and
REGISTER your new Morsø stove online:
<http://international.morsoe.com/warranty-registration>

IMPORTANT!

How to heat safely for the environment and yourself!

- **Use only dry wood**

Use only dry (max. 20% moisture content) and untreated wood. The fuel must be split and 8 - 12 cm thick.

- **Light**

Light with dry kindling (use 1 - 2 kg). Leave the door ajar and stay close to the stove during the lighting phase.

- **Good layer of embers**

Be certain to have a good layer of embers before refilling. The wood should light within 2 minutes. If the logs do not ignite it may, in an extreme case, cause the flue gases to ignite which may pose a risk to material damage or personal injury.

- **Refuelling**

When refuelling use 2 - 3 pieces of wood - no more than 2 - 2.5 kg.

- **Ensure adequate air**

i.e. clear and yellow flames.

- **Never burn overnight**



By appointment to The Royal Danish Court

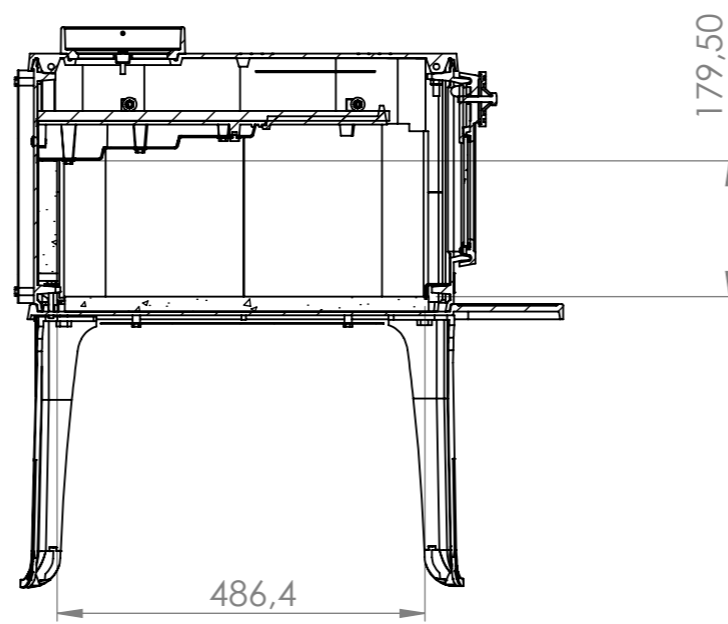
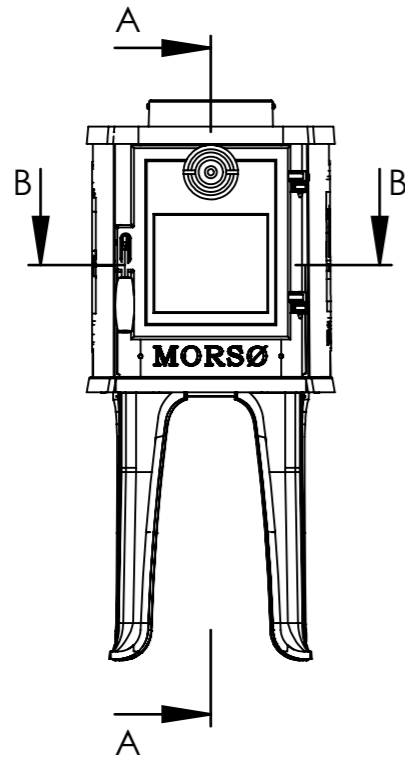
morsø

Morsø Jernstøberi A/S - 15.04.2020 - 72207600

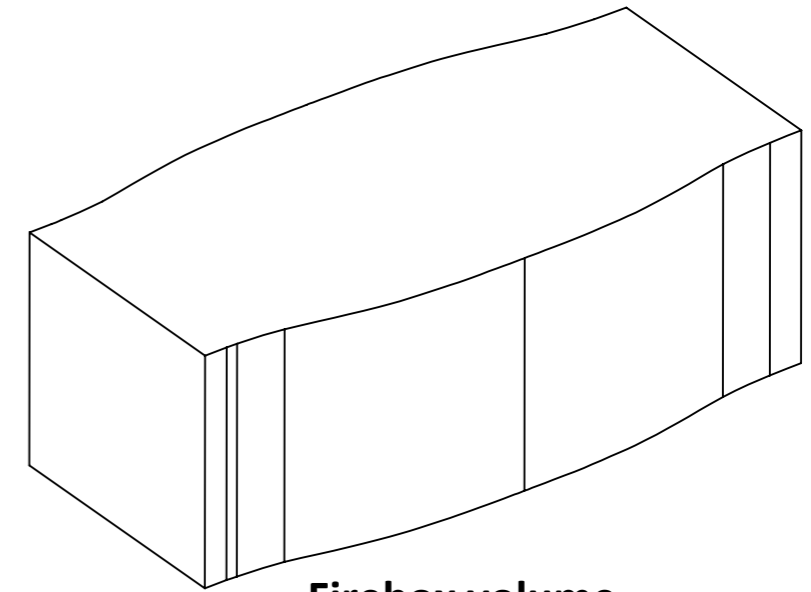
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E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Appendix B

Fire Box Volume Calculation



SECTION A-A

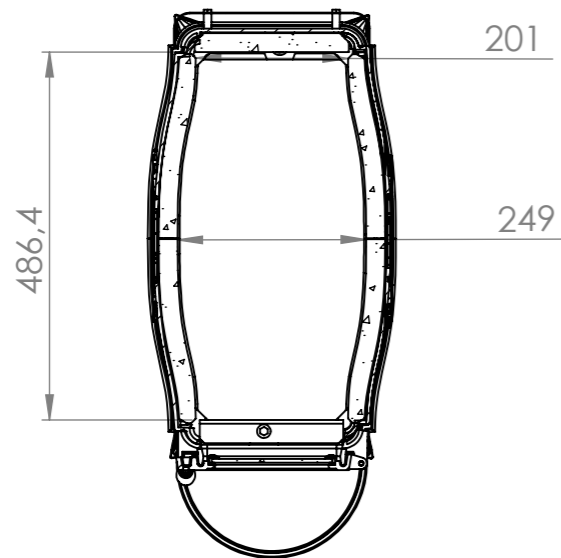


Firebox volume

0.0196082 m³

0.692460 ft³

(SolidWorks CAD calculation)




SECTION B-B

Firebox width: side insulation stone to side insulation stone

Firebox height: hearth to top end of back insulation stone

Firebox depth: back insulation stone to front door frame

Dim. without indication of margin acc. to DS/ISO 2768-1 m		Title: Morsø 2B Standard Firebox volume	Construction:	FjN	27.01.2020
Material:			Released:		
Weight kg:			Format:	A3	
Model no.:			Scale:	1:10	
Drawingtype:			Itemno.:		
Location of file:			Drawing no.:	2B-143	

This drawing is Morsø Jernstøberi A/S' property and must not be sold, lended or copied without any written authorization from the company.

*Morsø Jernstøberi A/S.
Model: 2B Standard 2020
Report Number: 0192WS025E*

Appendix C
DTI CBI Test Report
300-ELAB-2472-EPA_Non-CBI

TEST REPORT non-CBI

Report no.:
300-ELAB-2472-EPA



**DANISH
TECHNOLOGICAL
INSTITUTE**

Teknologiparken
Kongsvang Allé 29
DK-8000 Aarhus C
+45 72 20 20 00
info@dti.dk
www.dti.dk

Page 1 of 39

Init.: JSA/MXB

Order no.: 913288

No. of appendices: 30 (CBI report)

No. of appendices: 27 (non-CBI report)

Requested by: Company: Morsø Jernstøberi A/S
Address: Furvej 19
Postcode/town: DK-7900 Nykøbing Mors
Country: Denmark
Email: info@morsoe.com
Web: www.morsoe.com

Product: Wood heater type: Morsø 2B Standard 2020

Sample: Receipt at DTI, Aarhus: 3. February 2020

Test period: Date of testing: 5-6 February 2020

Procedure Testing of a wood heater in accordance with DTI method "ELAB-PP-BR-15" based on a relevant selection of standards and methods:

ASTM E2515-11	Yes
ASTM E3053-17 (Cordwood)	Yes
US EPA Method 28R in combination with ASTM E2780-10 (Cribwood)	No
CSA B415.1-10	Yes
EPA Communication on alternative method for Cordwood testing	Yes


Result: The stove/ meets the requirements of NSPS §40 CFR Part 60.


Remarks: See paragraph 2 - Remarks.

Terms: Accredited testing was carried out in compliance with international requirements, and the general terms and conditions of The Danish Technological Institute. The test results apply to the tested products only. This test report may be reproduced in extract only if the laboratory has approved the extract in writing. Danish Technological Institute is an EU Notified Body with identification number 1235 and DIN Certco test laboratory, PL 168.

Issued: 27.04.2020, Danish Technological Institute, Aarhus, Stoves&Boiler test lab

Signature:


Jes Sig Andersen
Senior Specialist


Max Bjerrum
Quality Assurance



 **DANAK**
Test reg. no. 300



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1. Introduction

1.1. General

This report concerns testing of a free-standing cast iron wood heater, type Morsø 2B Standard 2020

There is a CBI version of the report holding all the 30 annexes. In the non-CBI report, annex 12 (DTI test procedure), annex 22 (Assembly drawings) and annex 23 (parts drawings are excluded. Please find the full list of annexes in chapter 13.

Figures are stated in European notation, with a comma as the decimal separator and period as the thousand's separator.

1.2. Scope of testing

The appliance was tested to demonstrate compliance with the NSPS 2020 limits, using the ASTM E3053 alternative Cordwood test method broadly accepted by the administrator. Please find the letter of acceptance enclosed in annex 1

1.3. Site

Testing was accomplished by Danish Technological Institute, Kongsvang Allé 29, DK-8000 Aarhus C, Denmark in accordance to DTI's accredited EPA test procedure ELAB-PP-BR-15 (CBI information).

The test procedure is amended in annex 12 to the CBI report variant, but left out in the non-CBI report variant

1.4. Participants

DTI staff

Testing in the laboratory was accomplished by:

- Jes Sig Andersen, Senior Specialist (lead)
- Kim Sig Andersen, Consultant (trainee)

Client staff

The test work was witnessed by:

- Frank Juel Nielsen, Morsø Jernstøberi A/S

1.5. Test specimen

The stove was manufactured by:

Company:	Morsø Jernstøberi A/S
Address:	Furvej 6
Postcode/town:	DK-7900 Nykøbing Mors
Country:	Denmark

The stove weighs 62 kg.

The stove is not equipped with a catalyst. The landscape type of firebox is deeper than its wide, accommodation up to half a meter wood logs.



The effective firebox volume used for fuel load calculation is 0.01961 m³ (0.6925 ft³)
Please find the firebox dimensions in detail in the drawing 2B-143 amended I Annex 29

Variants: At the time of testing there was no known variants of the Morsø 2B Standard 2020 wood heater.

1.6. Description of the wood heater

Wood Stove Model: Morsø 2B Standard 2020



Type: Freestanding, radiation type cast iron wood heater.

Appliance Manufacturer: Morsø Jernstøberi A/S

Wood Stove Model: 2B Standard 2020

Type: Freestanding, radiant-type wood heater.

WOOD HEATER DESCRIPTION

Materials of Construction: The unit is constructed primarily of cast iron with a stainless-steel secondary combustion air supplying baffle. The firebox is lined with molded vermiculite firebricks. The feed door has a 150 mm by 130 mm glass panel and an 8 mm diameter fiberglass gasket.

Air Introduction System: Primary combustion air enters the firebox through a spin-draft located at the front of the appliance at the top of the fuel-loading door. Secondary combustion air enters the appliance through the upper back and supplies a three-step, tiered hollow baffle.



Combustion Control Mechanisms: The combustion air inlet is controlled by a spin-draft located at the top of the fuel-loading door in the center of the appliance. Only the primary combustion air is adjustable, the secondary combustion air is fixed.

Combustor: N/A

Internal Baffles: A hollow, tiered baffle with a cast iron extension baffle is mounted in the upper portion of the firebox. The flame path is forced to the front of the firebox where it travels up through the opening between the baffle and primary air manifold. A ceramic wool blanket is employed on the top of the baffle.

Other Features: None

Flue Outlet: The 5" diameter flue outlet is located at the top end of the appliance, to the back.

Firebox volume: 0,0196082 m³ or 0,692460 ft³ calculated in SolidWorks CAD simulator. Please find the technical drawing 2B-143 showing details on the firebox dimensions amended in Annex 29

2. Aging prior to testing

The stove had been aged in excess of 50 hours of operation prior to the certification test, while pre-testing at Morsø.

Morsø 2B Standard 2020 pre-test conditioning				
Last 50+ hours at medium burnrate				
Date dd.mm.yyyy	Time (hour)	Fuel added (kg)	Fuel moisture (% wet basis)	Flue gas temperature (C°)
30.01.2020	0	1,374	≈10/16,9	19
	0,81	3,354	16,9	179
	1			184
	2			194
	2,57	0,36	20,2	175
	2,72	3,785	19,7	200
	3			160
	4			134
	5			65
	6			53
29.01.2020	7			49
	8			45
	9			43
	10			39
	0	1,404	≈10/18,9	21
	0,59	3,324	18,9	196
	1			176
	2			208



	2,17	0,515	18,1	184
	2,33	3,61	15,8	221
	3			220
	4			121
	5			93
	6			78
	7			71
	8			56
	9			45
	10			36
28.01.2020	0	1,400	≈10/19,5	23
	0,54	2,986	19,8	181
	1			244
	1,78	0,484	20,0	176
	1,93	3,83	20,2	208
	2			205
	3			177
	4			106
	5			99
	6			82
27.01.2020	0	1,388	≈10/18,3	20
	0,72	3,256	18,8	165
	1			241
	1,96	0,49	19,0	200
	2,09	3,706	19,0	263
	2			230
	3			183
	4			100
	5			80
	6			71
	7			65
	8			59
	9			50
	10			43
24.01.2020	0	1,390	≈10/17,7	22
	0,51	3,100	18,5	197
	1			220
23.01.2020	0	1,364	≈10/15,6	23
	0,47	3,055	15,0	205
	1			240
	1,64	0,562	15,8	212
	1,81	3,826	15,4	230



	2			178
	3			129
	4			69
	5			55
	6			51
	7			48
	8			45
	9			43
	10			40
22.01.2020	0	1,401	≈10/17,8	23
	0,64	3,092	15,3	219
	1			218
	1,92	3,296	17,7	182
	2			269
	3			150
	4			98
	4,14	3,284	18,3	109
	5			191
	6			106
	7			86
	8			75
	9			65
	10			55

Please find the full set of pre-conditioning data in annex 2.



3. Summary of test results

3.1. Test schedule

The full certification test comprises two HF test runs, one MF test run and one LF test run.

Date	Test I	Test II	Remarks
5-2-2020	HF test	LF test	Both valid tests
6-2-2020	HF test	MF test	Both valid tests

3.2. Main results

Please see also the full set of test results in chapter 10

		Burn rate kg dry matter/hour	Emission grams/hour
#1	HF1 5-2	1,89	2,1854
#2	LF 5-2	0,48	0,1761
#3	HF2 6-2	1,74	1,8934
#4	MF	0,66	0,1681
	Weighted average		0,5455

3.3. Summary of the CS+HF and LF tests the 05-02-2020

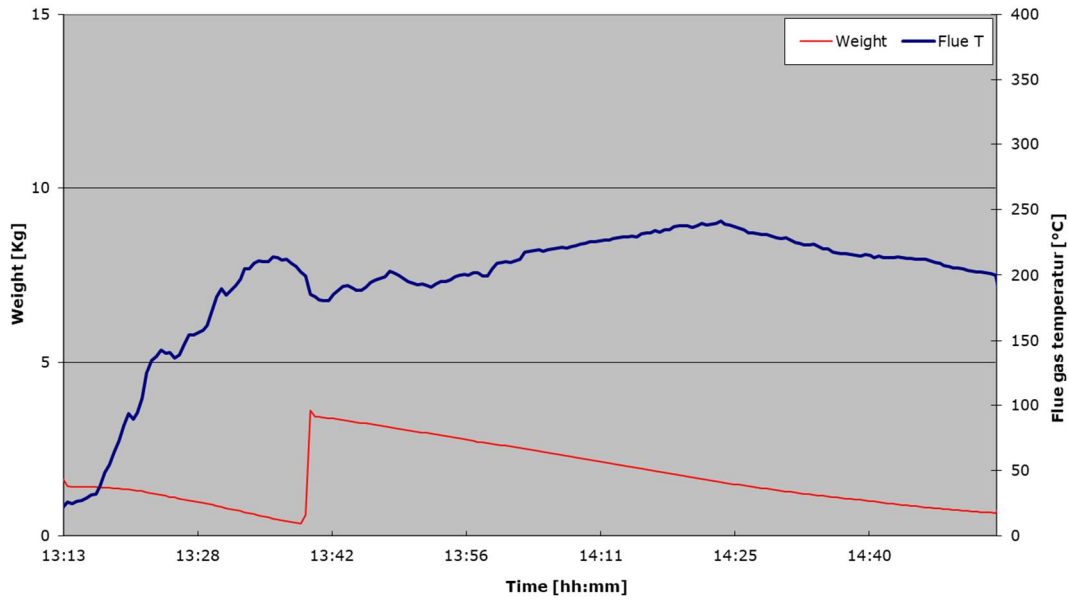
Data logger file Id: 2020-02-05_08-39-41

13:13:45	Ignition of the Cold Start part test using the gas torch for 30 seconds. The air valve is set in position 100% open (full action 3 and one quarter revolution). 0.582 kg of kindling (10% moisture DB) and 0.814 kg start-up fuel (21.0% moisture DB) was entered
13:14:30	Ignition is over, the door is closed right away. The air valve is maintained in its fully open position
13:40:17	End of the Cold start at 350 grams of embers, which value is taken down. The embers are evened out
13:40:27	Start of High Fire test using 5 logs of 3,141 kg firewood (19.9% moisture DB)
13:41:07	End of loading time after 50 seconds.
13:41:10	The door was closed right away, and the air valve was maintained in its fully open position, being the High Fire setting allowing maximum air supply
14:13:45	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 88867,6 normal litres
14:53:48	End of High Fire test cycle at 300 grams of embers (net), the combined bed of ember masses at the end of the High fire test was hence 350+300 = 650 g. The bed of embers was evened, and the air valve kept in its fully open position
14:53:50	Start of Low Fire test using 5 logs of in total 3.697 kg of firewood (21.1% moisture DB)
14:54:38	End of the loading time after 48 seconds, the door was closed right away
14:56:50	The air valve is throttled to its final LF position being three quarters of a revolution open
15:53:50	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 89542,12 normal litres
21:17:59	The Low Fire test is over at platform scale reading 650 g
Post Check	The mass combusted during the last 30 minutes of the test was 712-650 = 62 g, thus rendering the LF test valid with respect to the fire out criteria of no less the 50 g combusted during half an hour.

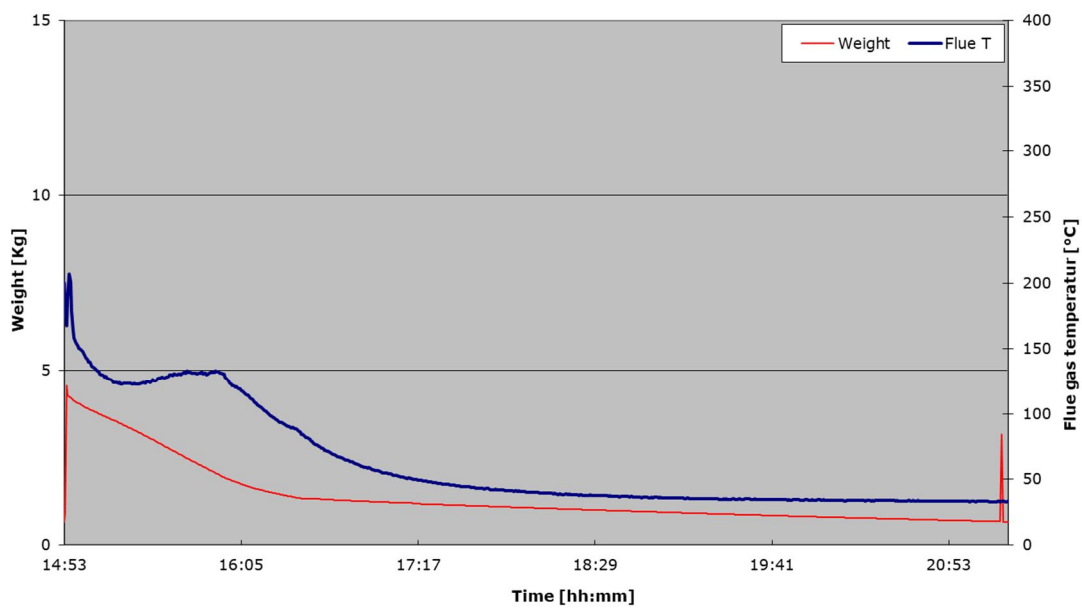


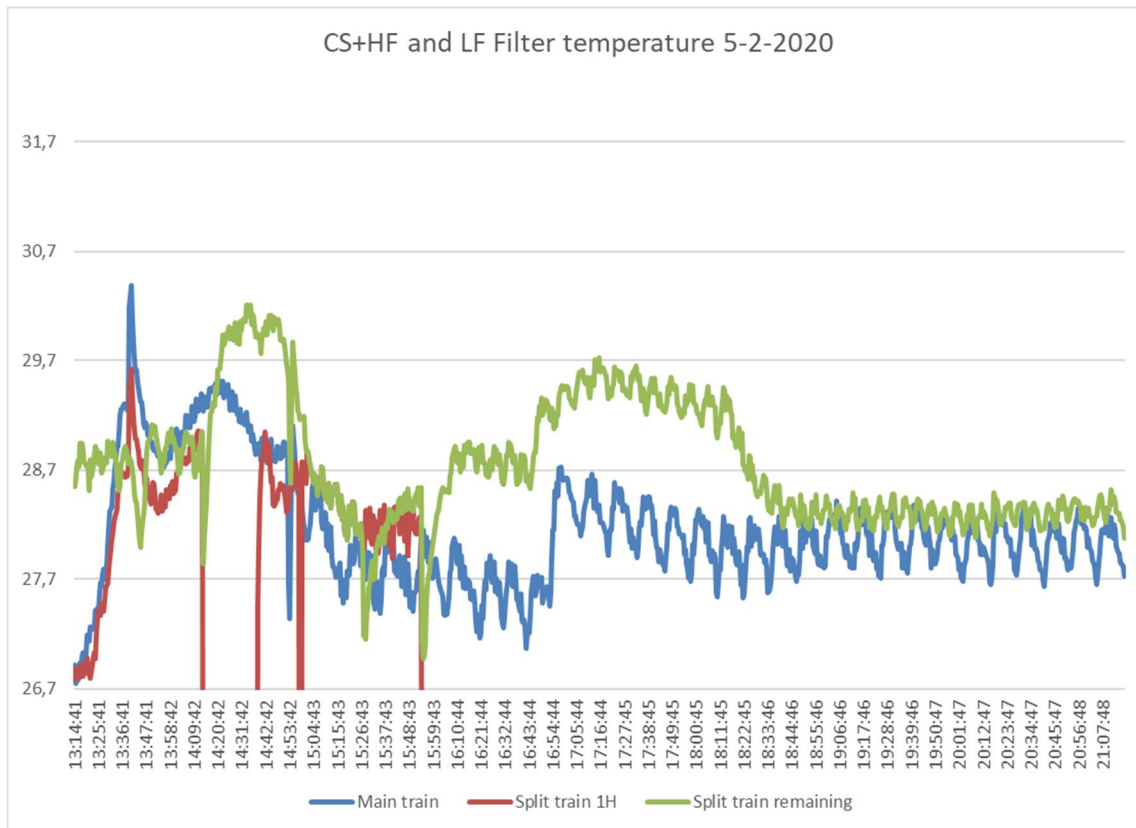
Please find the corresponding sequence of images in annex 3

High fire 1 test 2020-02-05

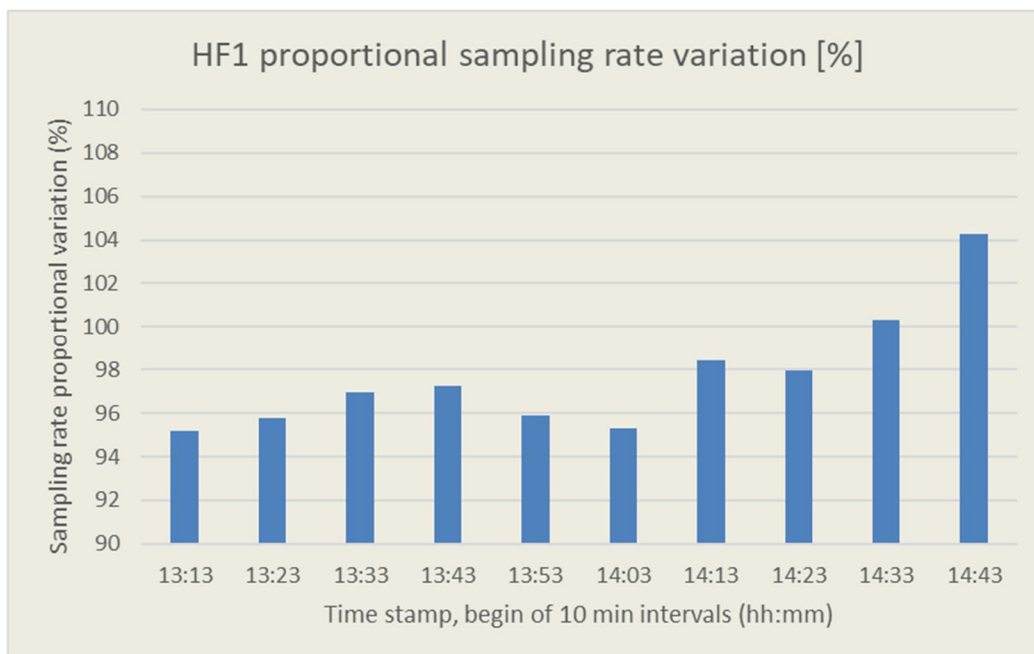


Low fire test 2020-02-05

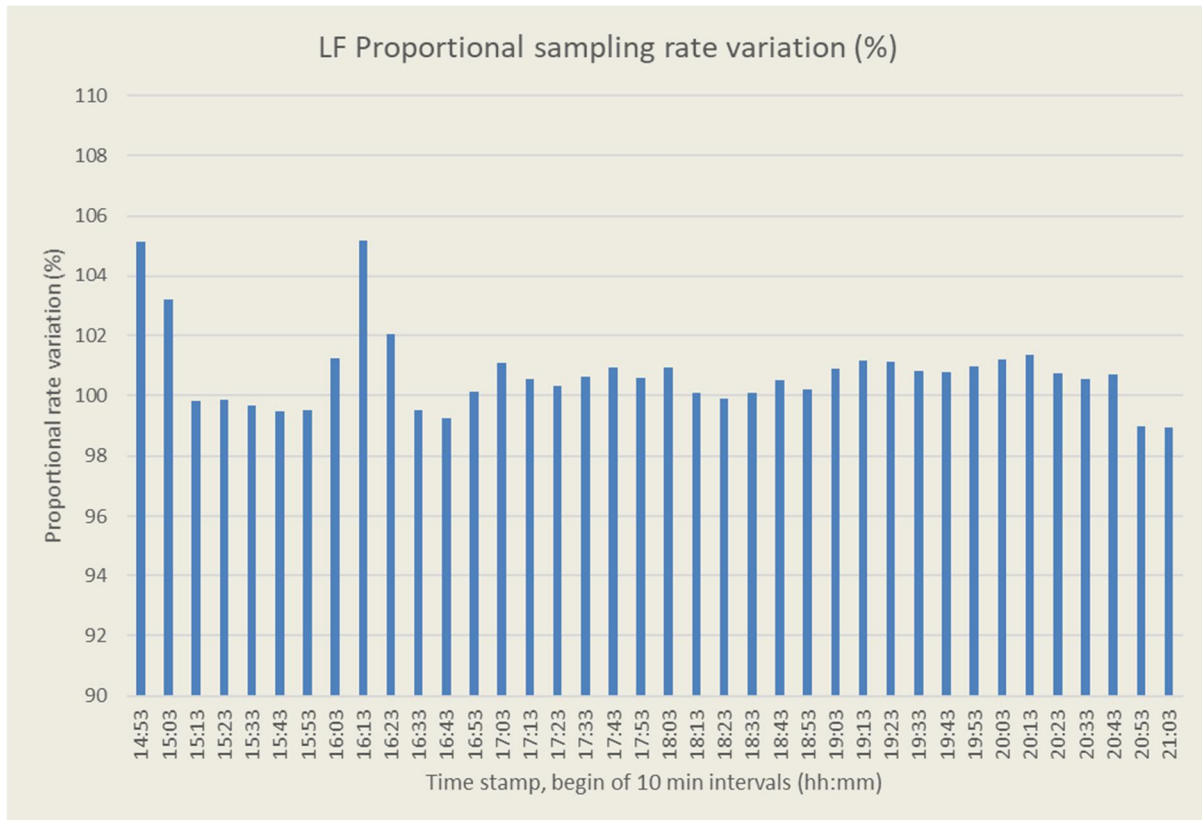




Evidence of filter temperature maintained in-between 26,7-32,2 °C (80-90 F) the 5th of February as per Alt-125 letter clause 1) requirement modifying ASTM E2515



HF1 (#1) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



LF (#2) proportional sampling rate variation as per ASTM E2515 clause 9.8.1

Time	EPA Flue gas Temperature (°C)	Surface temperature Top (°C)	Surface temperature Rear (°C)	Surface temperature Right side (°C)	Surface temperature Left side (°C)	Surface temperature Bottom (°C)
13:13:41	21,77	23,14	25,32	24,27	25,40	23,40

Evidence of cold starting conditions on day one, the 5th of February 2020 to ASTM E3053 clause 8.5.1 (Ambient temp was 22,2 degr C at 13:13:45 hours)



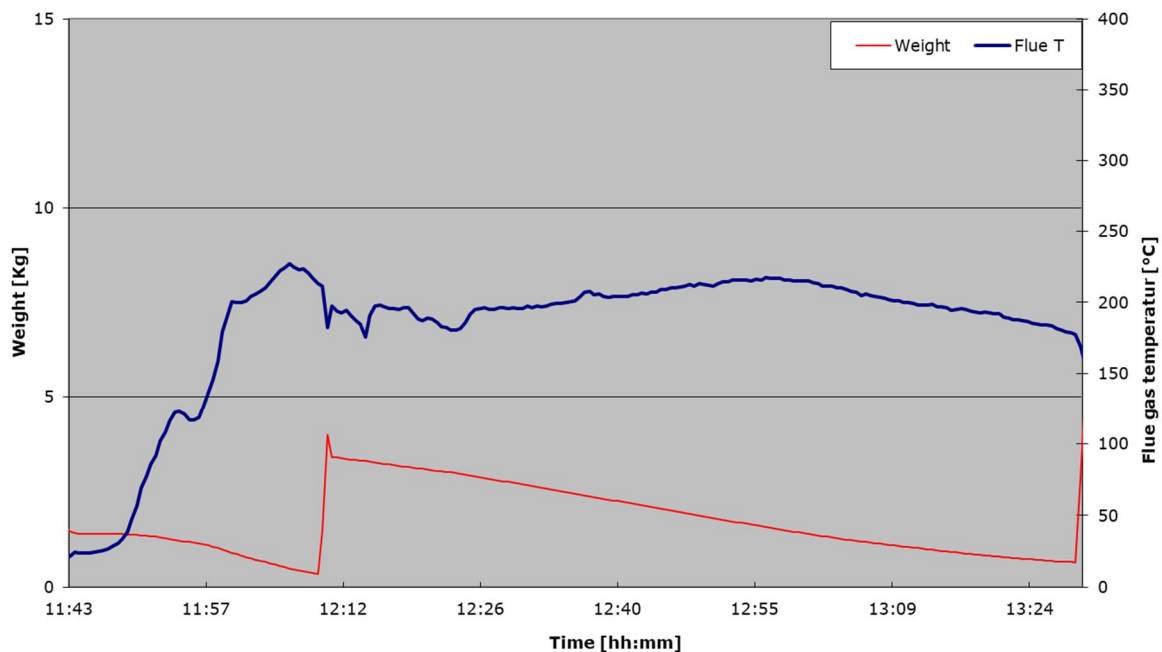
3.4. Summary of the CS+HF and MF tests the 06-02-2020

Data logger file Id: 2020-02-06_08-50-50

11:43:13	Ignition of the Cold Start part test using the gas torch for 30 seconds. The air valve is set in position 100% open (full action 3 and one quarter revolution). 0.580 kg of kindling (10% moisture DB) and 0.812 kg start-up fuel (20.3% moisture DB) was entered
11:43:43	Ignition is over, the door is closed right away. The air valve is maintained in its fully open position
12:09:30	End of the Cold start at 350 grams of embers, which value is taken down. The embers are evened out
12:09:40	Start of High Fire test using 5 logs of 3,156 kg firewood (20.2% moisture DB)
12:10:20	End of loading time after 40 seconds.
12:10:22	The door was closed right away, and the air valve was kept in its fully open position
12:43:15	Change of the split train filter holder arrangement at the hour, at gas meter reading 92179,0 normal litres
13:29:35	End of High Fire test cycle at 300 grams of embers (net), the combined bed of ember masses at the end of the High fire test was hence 350+300 = 650 g. The bed of embers was evened, and the air valve kept in its fully open position
13:29:40	Start of Medium Fire test using 5 logs of in total 3,855 kg of firewood 20.0% moisture (DB)
13:30:15	End of the loading time after 35 seconds
13:32:15	The air valve is now set at its final MF position being 1 revolution open
14:29:40	Change of the filter holder arrangement in the split extraction train at the hour, at gas meter reading 92880,12 normal litres
18:21:43	The Medium Fire test is over at platform scale reading of 650 grams
Post Check	The mass combusted during the last 30 minutes of the test was 734-650 = 84 g, thus rendering the MF test valid with respect to the fire out criteria of no less the 50 g combusted during half an hour.

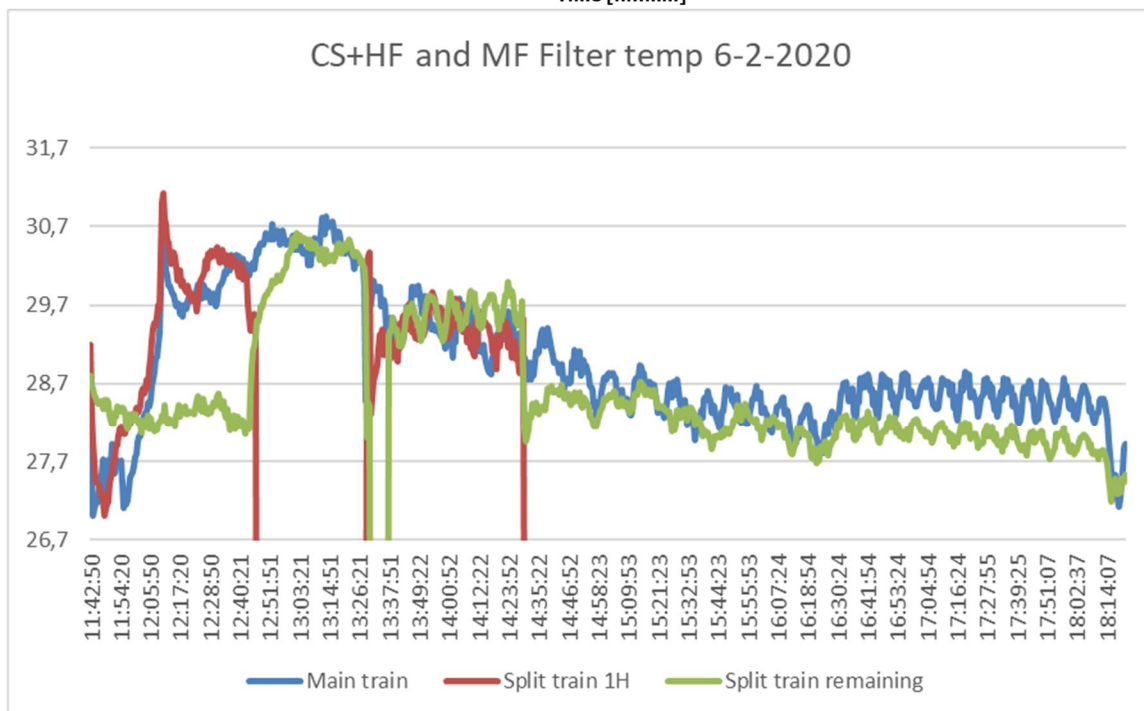
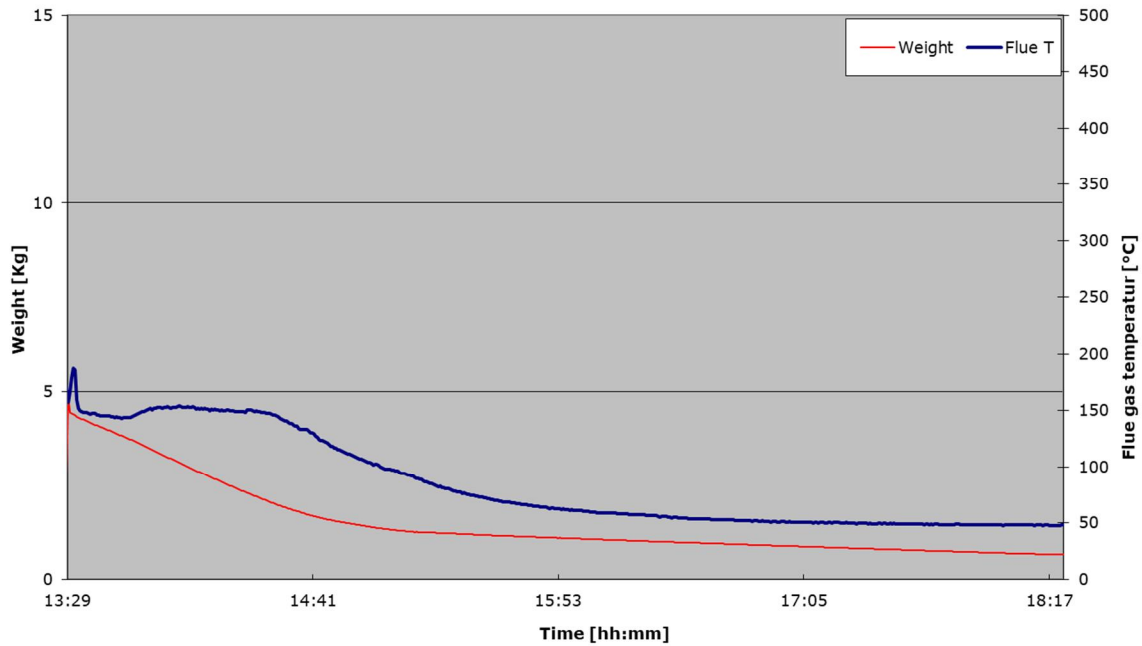
Please find the corresponding sequence of images in annex 4

High fire 2 test
 2020-02-06

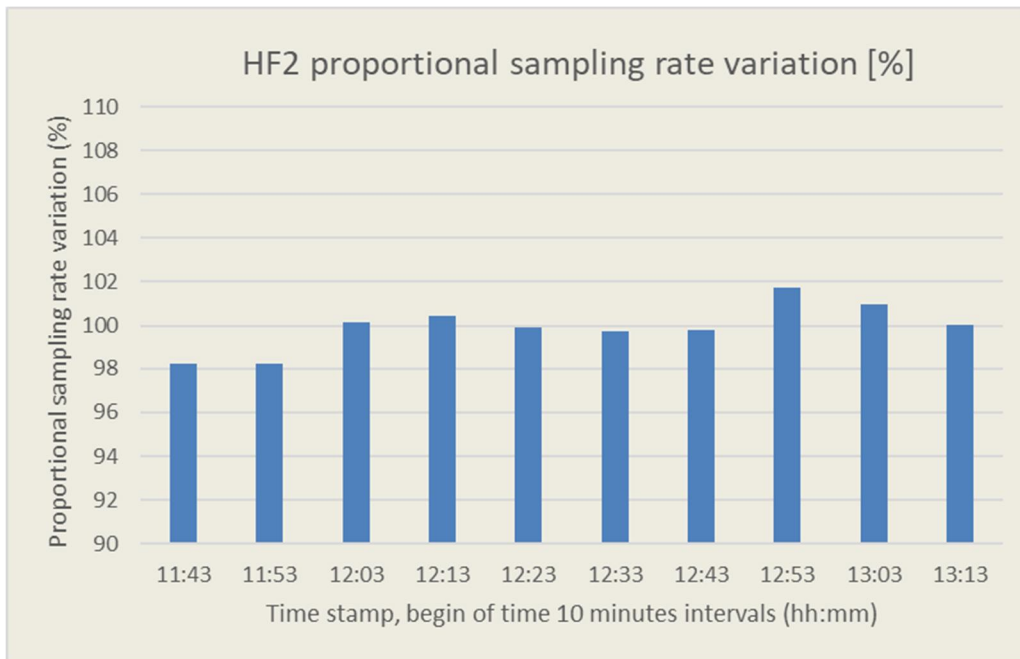




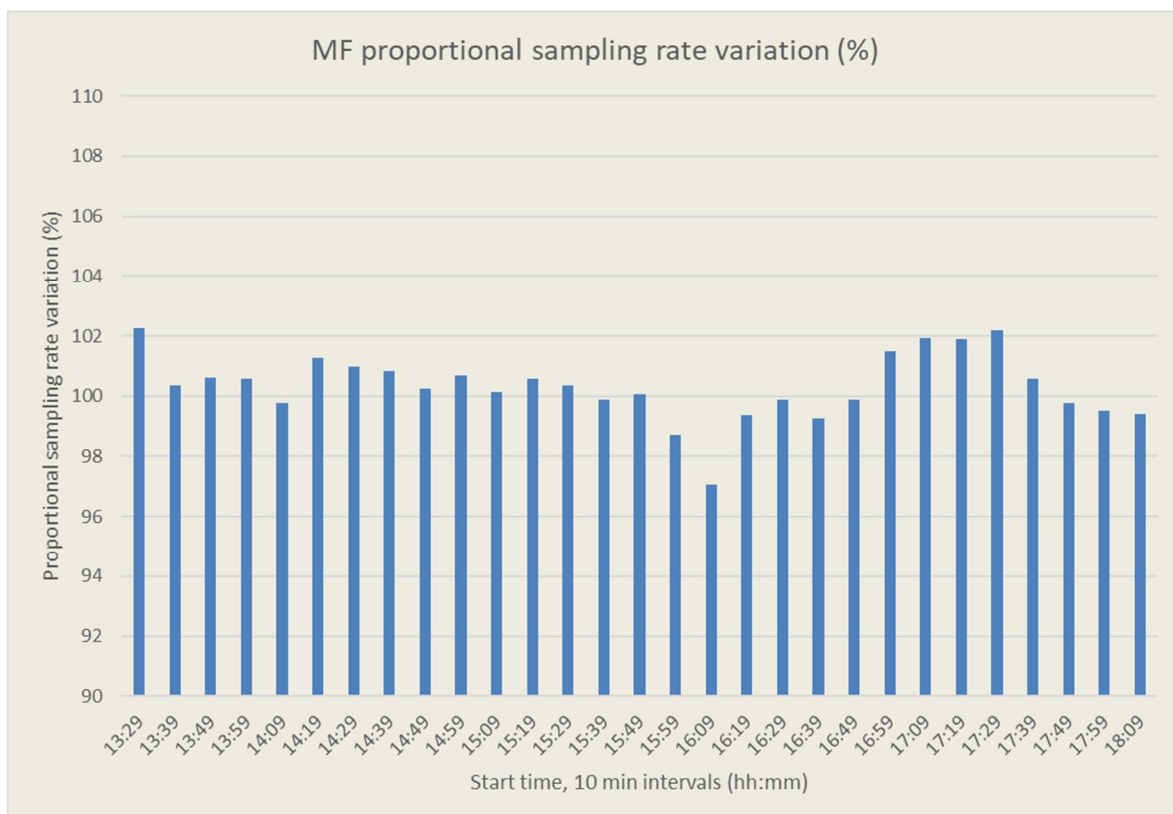
Medium fire test 2020-02-06



Evidence of filter temperature maintained in-between 26,7-32,2 °C (80-90 F) the 6th of February as per Alt-125 letter clause 1) requirement modifying ASTM E2515



HF2 (#3) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



MF (#4) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



Time	EPA Flue gas Temperature (°C)	Surface temperature Top (°C)	Surface temperature Rear (°C)	Surface temperature Right side (°C)	Surface temperature Left side (°C)	Surface temperature Bottom (°C)
11:43:20	21,59	22,25	23,90	23,06	24,25	22,17

Evidence of cold starting conditions on day two, the 6th of February 2020 to ASTM E2515 clause 9.8.1 (Ambient temp was 22,2 degr C at 11:43:13 hours)

3.5. Anomalies

None



3.6. High Fire net fuel consumption and burn rate calculations

HF1; 05-02-2020	Mass (kg) as fired	%-moisture	Ref basis	Dry mass (kg)/(lb)
Kindling	0,582	10	DB	0,529
Start-up fuel	0,814	17,0	WB	0,676
HF1 fuel load	3,141	16,9	WB	2,610
Total mass entered	4,537			3,815
End of CS bed of embers recorded	0,350	0		-0,350
Incremental HF1 bed of embers	0,300	0		-0,300
Cascaded mass of embers	0,650	Total wood consumption		3,165
Net dry fuel mass for ASTM PM calc		0		3,165
Net dry fuel mass for ASTM burn rate calc		0		2,310
HF1 Test duration (hours)	01:13:28		decimal	1,224
Resulting HF1 burn rate (kg/h) dry				1,887
Weighted avg WB moisture% for CSA PM calc				15,92
Input total wet fuel mass for CSA PM calc (kg)		15,92	WB	3,764
Input total wet fuel mass for CSA PM calc (lb)		15,92	WB	8,298
Input total wet fuel mass for CSA CO calc (kg)		16,90	WB	2,780
Input total wet fuel mass for CSA CO calc (lb)		16,90	WB	6,129

HF2; 06-02-2020	Mass (kg) as fired	%-moisture	Ref basis	Dry mass (kg)/(lb)
Kindling	0,580	10	DB	0,527
Start-up fuel	0,812	17,0	WB	0,674
HF2 fuel load	3,156	16,8	WB	2,626
Total mass entered	4,548			3,827
End of CS bed of embers recorded	0,350	0		-0,350
Incremental HF2 bed of embers	0,300	0		-0,300
Cascaded mass of embers	0,650	Total wood consumption		3,177
Net dry fuel mass for ASTM PM calc		0		3,177
Net dry fuel mass for ASTM burn rate calc		0		2,326
HF2 Test duration (hours)	01:20:05		decimal	1,335
Resulting HF2 burn rate (kg/h) dry				1,743
Weighted avg WB moisture% for CSA PM calc				15,85
Input total wet fuel mass for CSA PM calc (kg)		15,85	WB	3,776
Input total wet fuel mass for CSA PM calc (lb)		15,85	WB	8,324
Input total wet fuel mass for CSA CO calc (kg)		16,80	WB	2,795
Input total wet fuel mass for CSA CO calc (lb)		16,80	WB	6,163



3.7. Summary of test results

Test run number	Test designation	First hour emission rate (g/h)	Overall emission rate (g/h) from ASTM calc	Burn rate (Kg/h)	Heat output (BT/h) at LHV	Emission of CO (g/MJ)	Overall efficiency (%) at HHV
1	HF1	2,39	2,19	1,89	25299	1,03	74,7
2	LF	1,07	0,18	0,48	6959	2,69	81,7
3	HF2	2,44	1,89	1,74	23190	1,12	74,1
4	MF	0,52	0,17	0,66	9615	2,09	81,5



3.8. CSA HF1 PM report (#1)

DTI, CS+HF1 PM calculation

Manufacturer: Morsø
Model: 2B Std 2020
Date: 02-05-20
Run: #1
Control #: Fully open
Test Duration: 100,024
Output Category: High burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80,5%	86,3%
Combustion Efficiency	99,5%	99,5%
Heat Transfer Efficiency	81%	86,7%

Output Rate (kJ/h)	28.845	27.363	(Btu/h)
Burn Rate (kg/h)	1,90	4,20	(lb/h)
Input (kJ/h)	35.813	33.972	(Btu/h)

Test Load Weight (dry kg)	3,18	7,00	dry lb
MC wet (%)	15,916		
MC dry (%)	18,93		
Particulate (g)	3,64		
CO (g)	38		
Test Duration (h)	1,67		

Emissions	Particulate	CO
g/MJ Output	0,08	0,78
g/kg Dry Fuel	1,15	11,89
g/h	2,18	22,64
lb/MM Btu Output	0,18	1,82

Air/Fuel Ratio (A/F)	13,18
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3.9. CSA HF1 CO, HO, EFF report (#1)

DTI, HF1 CO, HO & EFF calc

Manufacturer: Morsø
Model: 2B Std 2020
Date: 02-05-20
Run: #1
Control #: Fully Open
Test Duration: 73,0175
Output Category: High burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	74,7%	80,0%
Combustion Efficiency	99,2%	99,2%
Heat Transfer Efficiency	75%	80,6%

Output Rate (kJ/h)	26.670	25.299	(Btu/h)
Burn Rate (kg/h)	1,90	4,19	(lb/h)
Input (kJ/h)	35.699	33.865	(Btu/h)

Test Load Weight (dry kg)	2,31	5,09	dry lb
MC wet (%)	16,9		
MC dry (%)	20,34		
Particulate (g)	3,64		
CO (g)	34		
Test Duration (h)	1,22		

Emissions	Particulate	CO
g/MJ Output	0,11	1,03
g/kg Dry Fuel	1,58	14,51
g/h	2,99	27,55
lb/MM Btu Output	0,26	2,40

Air/Fuel Ratio (A/F)	11,42
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15-04-2010



3.10. CSA LF report (#2)

DTI, LF all calculations

Manufacturer: Morsø
Model: 2B Std 2020
Date: 02-05-20
Run: #2
Control #: 3/4 rev. open
Test Duration: 383,591
Output Category: Low burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	81,7%	87,5%
Combustion Efficiency	97,1%	97,1%
Heat Transfer Efficiency	84%	90,1%

Output Rate (kJ/h)	7.336	6.959	(Btu/h)
Burn Rate (kg/h)	0,48	1,05	(lb/h)
Input (kJ/h)	8.982	8.521	(Btu/h)

Test Load Weight (dry kg)	3,05	6,73	dry lb
MC wet (%)	17,4		
MC dry (%)	21,07		
Particulate (g)	1,13		
CO (g)	126		
Test Duration (h)	6,39		

Emissions	Particulate	CO
g/MJ Output	0,02	2,69
g/kg Dry Fuel	0,37	41,27
g/h	0,18	19,72
lb/MM Btu Output	0,06	6,25

Air/Fuel Ratio (A/F)	10,85
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15-04-2010



3.11. CSA HF2 PM report (#3)

DTI, CS+HF2 PM calculation

Manufacturer: Morsø
Model: 2B Std 2020
Date: 02-06-20
Run: #3
Control #: Fully open
Test Duration: 106,0253333
Output Category: High burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	94,1%	100,8%
Combustion Efficiency	99,5%	99,5%
Heat Transfer Efficiency	95%	101,3%

Output Rate (kJ/h)	31.829	30.193	(Btu/h)
Burn Rate (kg/h)	1,80	3,96	(lb/h)
Input (kJ/h)	33.812	32.075	(Btu/h)

Test Load Weight (dry kg)	3,18	7,00	dry lb
MC wet (%)	15,85		
MC dry (%)	18,84		
Particulate (g)	3,36		
CO (g)	18		
Test Duration (h)	1,77		

Emissions	Particulate	CO
g/MJ Output	0,06	0,32
g/kg Dry Fuel	1,06	5,71
g/h	1,90	10,26
lb/MM Btu Output	0,14	0,75

Air/Fuel Ratio (A/F)	12,69
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3.12. CSA HF2 CO, HO, EFF report (#3)

DTI, HF2 CO, HO & EFF calc

Manufacturer: Morsø
Model: 2B Std 2020
Date: 02-06-20
Run: #3
Control #: Fully open
Test Duration: 79,519
Output Category: High burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	74,1%	79,4%
Combustion Efficiency	99,3%	99,3%
Heat Transfer Efficiency	75%	79,9%

Output Rate (kJ/h)	24.446	23.190	(Btu/h)
Burn Rate (kg/h)	1,76	3,87	(lb/h)
Input (kJ/h)	33.002	31.306	(Btu/h)

Test Load Weight (dry kg)	2,33	5,13	dry lb
MC wet (%)	16,8		
MC dry (%)	20,19		
Particulate (g)	2,65		
CO (g)	36		
Test Duration (h)	1,33		

Emissions	Particulate	CO
g/MJ Output	0,08	1,12
g/kg Dry Fuel	1,14	15,59
g/h	2,00	27,36
lb/MM Btu Output	0,19	2,60

Air/Fuel Ratio (A/F)	12,86
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3.13. CSA MF report (#4)

DTI, MF all calculations

Manufacturer: Morsø
Model: 2B Std. 2020
Date: 02-06-20
Run: #4
Control #: 1 revolution open
Test Duration: 291,7623333
Output Category: Medium burn

Technicians:
 Jes Sig Andersen

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	81,5%	87,3%
Combustion Efficiency	97,8%	97,8%
Heat Transfer Efficiency	83%	89,3%

Output Rate (kJ/h)	10.136	9.615	(Btu/h)
Burn Rate (kg/h)	0,66	1,46	(lb/h)
Input (kJ/h)	12.433	11.794	(Btu/h)

Test Load Weight (dry kg)	3,22	7,09	dry lb
MC wet (%)	16,6		
MC dry (%)	19,90		
Particulate (g)	0,82		
CO (g)	103		
Test Duration (h)	4,86		

Emissions	Particulate	CO
g/MJ Output	0,02	2,09
g/kg Dry Fuel	0,25	32,00
g/h	0,17	21,16
lb/MM Btu Output	0,04	4,85

Air/Fuel Ratio (A/F)	11,43
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Ver. 2,4

15-04-2010



3.14. Weighted avg. calculation (HF1 #1, LF#2, HF2#3, MF#4)

Model name	Morsø 2B Standard 2020			
Usable Firebox Volume - ft ₃	0,692			
Convection air fan	No			
Average for Each Test Run Category	L	M	HF1	HF2
Burn Rate - kg/h DB	0,48	0,66	1,89**	1,74**
PM Emission Rate - g/h	0,1761	0,1681	2,1854	1,8934
CO Emissions Rate - g/h	19,7	21,2	27,6	27,4
Overall Efficiency - CSA B415.1-10				
% HHV Basis	81,7	81,5	74,7	74,1
% LHV Basis	87,5	87,3	80,0	79,4
Heat Output - Btu/h	6959	9615	25299	23190
Category Weighting	40%	40%	10%	10%

ASTM E3053 Weighted Averages	
PM Emission Rate - g/h	0,546
CO Emissions Rate - g/h	21,86
Overall Efficiency - CSA B415.1-10	
% HHV Basis	80,2
% LHV Basis	85,9
Heat Output Range - Btu/h	6959 to 25299

CO arithmetical average for EPA g/h *	22,8
CO arithmetical average for EPA g/min	0,38

*) please also find the arithmetic CO emi average in the Main results table, chapter 10
 **) The HF2 burn rate is corrected from 1,76 kg dry/h as suggested by the CSA HF2 CO, HO & EFF calculation to the true burn rate of 1,74 kg dry/h (1,743) from the ASTM calculation. Similarly, the HF1 burn rate is corrected from 1,90 kg dry/h as suggested by the CSA HF1 CO, HO & EFF calculation to the true burn rate of 1,89 kg dry/h (1,886) from the ASTM calculation.



3.15. Test facility conditions

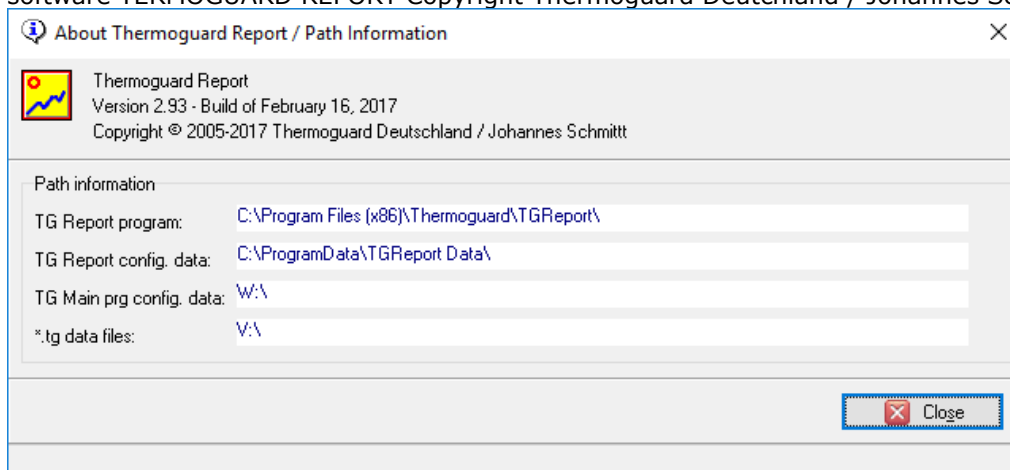
DTI is located at Kongsvangs Allé 29, DK-8000 Århus Denmark, at sea level.

Latitude North: 56,1374

Longitude East: 10,1864

Altitude above sea level: 15 meters

Test facility room temperature, relative humidity and barometric pressure is monitored by the software TERMOGUARD REPORT Copyright Thermoguard Deutschland / Johannes Schmitt



3.16. Fuel properties

The test fuel was natural Beech wood split and cut according to the manufacturer's written instructions and compliant with the provisions of ASTM E3053, clause 8.4

The specific gravity of 0,67 dry weight to dry volume ratio was taken from E3053 Fig 2 page 6. Similarly, the gross calorific value of 18800 MJ/kg or 8088 Btu/lb was selected from E3053 Annex A1, table A.1.1 page 17.

The length of the wood logs was 32-34 cm. The basic shape of the wood logs was approximated triangular, trapezoidal or rhombic respecting the minor to major ratio > 40% according to figures 1A and 1B of E3053

The composition of the HF and LF/MF fuel batches were calculated using the standard XLS Wood calculator adjunct to ASTM E3053

The nominal mass of the HF fuel load was 3,141 kg or 6,925 lb

The nominal HF mass range was 3,00-3,33 kg or 6,60-7,30 lb

The allowable mass range of the HF Core load was 1,40-2,00 kg or 3,10-4,50 lb

The allowable mass range of the HF Remainder load was 1,10-1,70 kg or 2,40-3,80 lb

The nominal mass of the LF/MF fuel load was 3,769 kg or 8,310 lb

The nominal LF/MF mass range was 3,581-3,958 kg or 7,894-8,725 lb

The allowable mass range of the LF/MF Core load was 1,696-2,45 kg or 3,739-5,401 lb

The allowable mass range of the LF/MF Remainder load was 1,319-2,073 kg or 2,908-4,570 lb

For all test fuel loads, only 5 logs were used; 3 core and 2 remainder.



3.17. Summary of test fuel load properties

	Core 1	Core 2	Core 3	Remainder 1	Remainder 2	Remainder 3
HF1 mass (kg)	0,616	0,607	0,603	0,900	0,415	
HF1 moist. (% DB)	19,9	19,4	19,5	19,7	21,5	
LF mas (kg)	0,711	0,682	0,710	1,016	0,577	
LF moist. (% DB)	20,9	20,8	19,1	22,5	21,7	
HF2 mas (kg)	0,661	0,594	0,586	0,893	0,422	
HF2 moist. (% DB)	20,6	19,3	20,3	20,4	20,1	
MF mass (kg)	0,771	0,725	0,699	1,042	0,618	
MF moist. (%DB)	19,8	20,3	19,8	20,2	19,7	

Please find the ASTM E3053 fuel load calculations enclosed in appendices 5-8



Example of batch of firewood

4. Test accomplishment

4.1. Remarks

The certification tests were accomplished in accordance with the manufacturers written test procedure (please find enclosed in annex 9), the ASTM E3035-17 Cordwood test standard, the EPA ALT125 letter and the ASTM E2515-11 dilution tunnel and sampling standard.



4.2. Start-up operation

The Morsø 2B Standard 2020 stove has a traditional air control system with a rotary type dial on the loading door to the front. For start-up operation, the air valve is kept fully (3 and one quarter revolution), which position is maintained during the high fire tests. For the low fire test, the air valve is throttled to 3 quarters of a revolution open, and for the medium fire test, the air valve is throttled to 1 revolution open.

Please find a detailed description of the start-up procedure in the manufacturers test instruction for testing procedure (annex 9)

4.3. Sampling arrangement

The PM specimen is extracted from the Ø150 mm Full Flow Dilution Tunnel by means of a dual probe and filter holder system as specified by ASTM E2515-11, clause 6.1.1.1. The filter holders are of type 47 mm Pall 1235. There are 3 sets of backed-up filter holders for PM sampling and one single filter holder for the room blanc measurement.

During the course of the test, the filter holders in the PM sampling lines may be heated respectively cooled as appropriate, to control the filter temperature in the narrow band of 80-90 degrees F.



4.4. Fluepipe and chimney configuration

The chimney is composed by single wall uninsulated fluepipe in combination with half insulated system steel chimney compliant with ASTM E3053-17 clause 6.3

The single wall fluepipe extends to 2,50 m above the test rig floor. In combination, the insulated system chimney extends to 4,40 m above the test rig floor, compliant with ASTM E3053-17 clause 8.2.3, stating $2,6 \pm 0,1$ m for the uninsulated part of the flue and $4,6 \pm 0,3$ m for the total height of the chimney.

Please find a schematic drawing of the chimney configuration in annex 11



The chimney was connected to the stove using the top flue outlet

5. Sampling methods

5.1. Particulate extraction system

The particulate matter is sampled in accordance with ASTM E2515-11. Two identical sampling trains are applied at angular position to each other. The sampling trains consists each of a set of front and back Pall type 1235 Al 47 mm in-line filter holders. Filter for PM sampling are Pall TX-40 EMFAB Teflon-coated filters 47 mm membrane filters.

The sampling train operated throughout the entire duration of the test is called the 'Main train'. The other sampling train, shifting filters at the hour is called the 'Split train'.

5.2. Calculation of PM emission

The calculations are enclosed in a format following the notation of equations in ASTM E2512-11

Please find the calculation of the first High Fire test (test run #1) in annex 14; the calculations of the Low Fire test (test run #2) in annex 15; the calculations of the second High Fire test (test run #3) in annex 16 and the calculations of the Medium Fire test (test run #4) in annex 17

6. Quality assurance

6.1. Instrument calibration

There is a set of EPA instrument calibration certificates in annex 13

6.2. Logger data

Please find the sets of logger data, sampled every 5 seconds and recorded every 30 seconds in appendices 18 (HF1 test 050220), annex 19 (LF test 050220), annex 20 (HF2 test the 060220) and in annex 21 (MF test 060220)

Legend:

Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]
1	2	3
Ambient temperature	Main train filter temp	Split train 1H filter temp

Row 1 is the original Danish notation incl metric

Row 2 is the data logger channel number

Row 3 -5 are the corresponding terms in English

6.3. Morsø's Quality Assurance Plan

Quality Assurance Plan is a plan for assuring the quality for products, tested according to NSPS by taking measurements and checks of some key components, referred to as K-list components. Please find the entire QA plan amended in annex 30.



7. Documentation material

Documentation material:

Assembly drawings in annex 22

Parts drawings in annex 23

Materials sheets in annex 24

Label(s) in annex 25

Picture(s) in annex 26

User's manual in annex 27

Firebox volume in annex 29

The technical drawings and parts drawings are amended to the CBI report variant only.



8. Remarks

8.1. Internal correction of gasmeters

The Vögtlin Red-Y gasmeters have internal correction to as well normal temperature (here 0-degree C) and to pressure (here 1013 hPa)
Consequently, in the calculations, the gasmeter temperature and pressure is entered as 0 degree C respectively 1013 hPa.
1013 Hectopascal (hPa) equals 14,69 psi or 10329,7 mm water column.

8.2. Joint Cribwood and Cordwood spreadsheet

The spreadsheet used for calculation of the emissions is a 'joint' Cribwood and Cordwood spreadsheet, in so far as the particle emission calculation is identical for Cribwood and Cordwood. When used for a Cordwood test there are some void spaces under the fuel mass calculation. Also, generally the fuel is referred to as 'Cribs' even though for good reasons, for Cordwood, wood logs are used.

8.3. Request of restriction of the air valve action

The action of the air valve must be restricted by means of a physical stop or by blanking out a corresponding proportion of the opening of the air valve plate, as to prevent use of the stove at any valve setting lower than the one used during the Low Fire test, here 3 quarters of a revolution open.

8.4. Duplicated High fire calculations

AS well for the ASTM calculations as for the CSA calculations we have performed double calculations. One which applies for the HF part alone, to return the burn rate and another for the combined CS + HF part tests, to return the particle emission.

9. Discussion of Results

For the high fire burn rate calculations, there is a minor still insignificant deviation from the (true) ASTM calculation to the CSA calculation.

For the HF1 test the true burn rate is 1,886 kg dry matter per hour. CSA suggests 1,90 kg dry matter per hour

For the HF2 test, the true burn rate is 1,743 kg dry matter per hour. CSA suggests 1,76 kg dry matter per hour

The deviating results are attributed to different rounding and number of decimal places, metric conversion factors in combination with direct test run timekeeping for ASTM calculation, but secondary or derived test run timekeeping for the CSA calculation.



10. Main results

	High fire 1	Low fire	High fire 2	Medium fire
Date	5-2-2020	5-2-2020	6-2-2020	6-2-2020
Run Number	#1	#2	#3	#4
ASTM 3053 Emission Rate g/Hr.	2,19	0,18	1,89	0,17
ASTM E3053 Emissions – First Hour (g/hr)	2,39	1,07	2,44	0,52
ASTM 3053 Burn Rate Kg/Hr.	1,89	0,48	1,74	0,66
BTU/Hr.	25299	6959	23190	9615
Overall Efficiency (%) HHV	74,7	81,7	74,1	81,5
CO Emissions (g/MJ Output)	1,03	2,69	1,12	2,09
CO Emissions (g/kg Dry Fuel)	14,5	41,3	15,6	32,0
CO Emissions (g/hr)	27,6	19,7	27,4	21,2
CO Emissions (g/min)	0,46	0,33	0,46	0,35
Weighed particle emission rate, average of 4 test runs (HF1, LF, HF2, MF)	0,55 g/h			
Weighted average energy efficiency (at HHV) of 4 test runs (HF1, LF, HF2, MF)	80,2 %			
Arithmetical average emission of CO for EPA of 4 test runs (HF1, LF, HF2, MF)	22,8 g/h		0,38 g/min	



11. Test details

11.1. Pre-conditioning

The stove had been aged in excess of 50 hours at the client's internal test lab prior to the certification test.

Please find the documentation of pre-conditioning amended in annex 2



11.2. Data, HF1 (#1) test run 5th of February 2020

Parameter	Value	Unit
Pitot factor (F _p)	0,97	
Dynamic pressure duct, Pd	24,2	Pa
Static pressure duct, Ps	37,4	Pa
Date of testing	05-02-2020	dd-mm-yyyy
Start of Cold start test	13:13:45	hh:mm:ss
Start of the High fire test	13:40:20	hh:mm:ss
End of High fire	14:53:48	hh:mm:ss
Test duration (Cold start + High fire)	1:40:03	hh:mm:ss
Duration of the High fire test	1:13:28	hh:mm:ss
Mean stove surface temperature at the start	25,3	°C
Kindling and Start-up fuel load	1,396	kg
Start-up fuel moisture	21,2	% DB
Test fuel load	3,141	kg
Test fuel moisture	19,9	% DB
Resulting burn rate	1,89	kg (dry matter)/h
Particulate emission rate, first hour	2,39	g/h
Particulate emission rate, overall	2,19	g/h
Sampled gas volume (nl), main train	681,14	NI
Captured pm mass, main train	3,7	mg
Sampled gas volume (nl), split train	684,50	NI
Captured pm mass, split train	4,3	mg
PM mass total (average)	3,64	g
Relative deviation in pm emission, main train to split train	6,5	%
Absolute deviation in pm emission, main train to split train	0,16	g/kg (dry matter)
Mean flow rate probe, main train	6,76	m/s
Mean flow rate probe, split train	6,82	m/s
Mean flow rate duct	6,83	m/s
Flue gas temperature (mean)	194	°C
Flue draught (mean)	16	Pa

Parameter	Start value	End value	Units
Ambient temperature	21,5	21,9	°C
Relative humidity	29,0	26,0	%
Barometric pressure	1020,0	1016,0	hPa
Draft in front of the test rig	0,05	0,08	m/s
Flue gas temperature	27	203	°C



11.3. Data, LF (#2) test run 5th of February 2020

Parameter	Value	Unit
Pitot factor (F _p)	0,91	
Dynamic pressure duct, Pd	27,4	Pa
Static pressure duct, Ps	42,6	Pa
Date of testing	05-02-2020	dd-mm yyyy
Start of test	14:53:50	hh:mm:ss
End of test	21:17:59	hh:mm:ss
Test duration	06:24:09	hh:mm:ss
Mean stove surface temperature at the start	NA	°C
Kindling and Start-up fuel load	NA	kg
Start-up fuel moisture	NA	% DB
Test fuel load	3,697	kg
Test fuel moisture	21,1	% DB
Resulting burn rate	0,48	kg (dry matter)/h
Particulate emission rate, first hour	1,08	g/h
Particulate emission rate, overall	0,18	g/h
Sampled gas volume (nl), main train	2568,9	NI
Captured pm mass, main train	1,3	mg
Sampled gas volume (nl), split train	2558,6	NI
Captured pm mass, split train	1,4	mg
PM mass total (average)	1,13	g
Relative deviation in pm emission, main train to split train	2,80	%
Absolute deviation in pm emission, main train to split train	0,02	g/kg (dry matter)
Mean flow rate probe, main train	6,84	m/s
Mean flow rate probe, split train	6,82	m/s
Mean flow rate duct	6,63	m/s
Flue gas temperature (mean)	62	°C
Flue draught (mean)	5	Pa

Parameter	Start value	End value	Units
Ambient temperature	22,1	21,1	°C
Relative humidity	27,9	29,9	%
Barometric pressure	1025,9	1023,8	hPa
Draft in front of the test rig	0,07	0,06	m/s
Flue gas temperature	187	33	°C



11.4. Data, HF2 (#3) test run 6th of February 2020

Parameter	Value	Unit
Pitot factor (F _p)	0,92	
Dynamic pressure duct, Pd	26,1	Pa
Static pressure duct, Ps	40,3	Pa
Date of testing	06-02-2020	dd-mm-yyyy
Start of Cold start test	11:43:13	hh:mm:ss
Start of the High fire test	12:09:40	hh:mm:ss
End of High fire test	13:29:35	hh:mm:ss
Test duration (Cold start + High fire)	01:46:22	hh:mm:ss
Duration of the High Fire test	01:20:00	hh:mm:ss
Mean stove surface temperature at the start	23,3	°C
Kindling and Start-up fuel load	1,392	kg
Start-up fuel moisture	20,3	% DB
Test fuel load	3,156	kg
Test fuel moisture	20,2	% DB
Resulting burn rate	1,74	kg (dry matter)/h
Particulate emission rate, first hour	2,44	g/h
Particulate emission rate, overall	1,89	g/h
Sampled gas volume (nl), main train	713,4	NI
Captured pm mass, main train	3,8	mg
Sampled gas volume (nl), split train	713,9	NI
Captured pm mass, split train	4,1	mg
PM mass total (average)	3,36	g
Relative deviation in pm emission, main train to split train	3,36	%
Absolute deviation in pm emission, main train to split train	0,07	g/kg (dry matter)
Mean flow rate probe, main train	6,83	m/s
Mean flow rate probe, split train	6,84	m/s
Mean flow rate duct	6,76	m/s
Flue gas temperature (mean)	182	°C
Flue draught (mean)	15	Pa

Parameter	Start value	End value	Units
Ambient temperature	21,3	22,0	°C
Relative humidity	34,6	34,6	%
Barometric pressure	1022,3	1022,3	hPa
Draft in front of the test rig	0,06	0,09	m/s
Flue gas temperature	24	220	°C



11.5. Data, MF (#4) test run 6th of February 2020

Parameter	Value	Unit
Pitot factor (F _p)	0,92	
Dynamic pressure duct, Pd	26,1	Pa
Static pressure duct, Ps	40,3	Pa
Date of testing	06-02-2020	dd-mm-yyyy
Start of test	13:29:40	hh:mm:ss
End of test	18:21:43	hh:mm:ss
Test duration	04:52:03	hh:mm:ss
Mean stove surface temperature at the start	NA	°C
Kindling and Start-up fuel load	NA	kg
Start-up fuel moisture	NA	% DB
Test fuel load	3,855	kg
Test fuel moisture	20,0	% DB
Resulting burn rate	0,66	kg (dry matter)/h
Particulate emission rate, first hour	0,52	g/h
Particulate emission rate, overall	0,17	g/h
Sampled gas volume (nl), train 1	1941,1	NI
Captured pm mass, train 1	1,0	mg
Sampled gas volume (nl), train2	1948,1	NI
Captured pm mass, train 2	0,9	mg
PM mass total (average)	0,82	g
Relative deviation in pm emission, train 1 to train 2	4,87	%
Absolute deviation in pm emission, train 1 to train 2	0,03	g/kg (dry matter)
Mean flow rate probe, train 1	6,77	m/s
Mean flow rate probe, train 2	6,81	m/s
Mean flow rate duct	6,68	m/s
Flue gas temperature (mean)	85	°C
Flue draught (mean)	8	Pa

Parameter	Start value	End value	Units
Ambient temperature	23,0	21,3	°C
Relative humidity	34,6	33,1	%
Barometric pressure	1022,3	1018,7	hPa
Draft in front of the test rig	0,08	0,05	m/s
Flue gas temperature	173	48	°C



12. Test equipment

Testing was carried out at test rig C. (EPA setup)

Instrument	Traceability	Instrument number Test rig C
Scale, Mettler, 600 kg, KC 600	ELAB	270-A-1638
Thermo couples, EPA sampling train Type T	ELAB	Id No. 145092
Thermo couples, others, Type T and type K	ELAB	Id No.134396
DOP version II	-	-
Data acquisition unit, HP 34970A	DANAK 200	270-A-1630
Surface temperature, Technoterm 5500	DANAK 200	270-A-0976
Surface temperature, Dan 1200	DANAK 200	270-A-0876
Pressure gauge, Autotran 700 (flue draught)	ELAB	270-A-1632
Pressure gauge, Autotran 700 (Pd)	ELAB	Id No. 145065
Pressure gauge, Autotran 700 (Ps)	ELAB	270-A-1634
Calibrator, Jofra 650 SE	DANAK 200	270-A-0912
Scale, Mettler Toledo (15kg/1g)	ELAB	Id No. 5822
Scale, Mettler Toledo XS4002S (4,1kg/10mg)	ELAB	Id No. 135794
Scale, Mettler Toledo XS204 (220g/0,1mg)	DANAK 200	Id No. 7084
Testo 440 and Turbulence probe (Air velocity Laboratory)	DANAK 200	Id No. 176529
TSI Micromanometer and Pitottube (Air velocity Dilution tunnel)	DANAK 200	Id No. 4771 (270-A-2406)
Hygrometer (air humidity) Thermoguard	DANAK 200	Id No. 142357
Barometric reading (atmospheric pressure) Thermoguard / (Ahlborn)	DANAK 200	Id No. 7102
Pitot tube (air velocity in flue)	ELAB	270-A-1631-14
Dust measuring equipment (particle measuring equipment)	-	Id No. 145093
Gas meter, Red-y (-H) (Whole charge, With outlet)	DANAK 200	Id No. 144236
Gas meter, Red-y (-D) (Divided charge with outlet)	DANAK 200	Id. No. 144239
Flow meter (-R) (Room blanc)	DANAK-200	Id No. 144257
Thermo sensor, Dilution tunnel, Pt 100	DANAK 200	270-A-1628
PST leakage meter (Brooks glass tube)	ELAB	Id no. 83013
CO/CO ₂ analyzer, ABB IR	ELAB	270-A-2276
Spangas CO/CO ₂ , AGA (High CO and CO ₂)	Swedac	Id no. 135573
Spangas CO/CO ₂ , AGA (Low CO)	Swedac	Id no. 135574
Moisture meter	ELAB	Id No. 145070



Vacuum meter (-H) (Main train)	DANAK 200	Id No. 145074
Vacuum meter (-D) (Split train)	DANAK 200	Id No. 145076
Vacuum meter (-R) (Room)	DANKA 200	Id No. 145077
Pressure meter (-H) (Main train)	DANAK 200	Id No. 145078
Pressure meter (-D) (Split train)	DANAK 200	Id No. 145079
Thermometer (Fuel storage room)	ELAB	Id No. 145081

13. Annexes

Annex 1: EPA Letter of acceptance, ALT 126 (3 pages)
Annex 2: Documentation of aging (49 pages)
Annex 3: Images from the test sequence the 20. February 2019 (3 pages)
Annex 4: Images from the test sequence the 21. February 2019 (2 pages)
Annex 5: High fire 1 fuel load calculator 050220 (2 pages)
Annex 6: Low fire fuel load calculator 050220 (2 pages)
Annex 7: High fire 2 fuel load calculator 060220 (2 pages)
Annex 8: Medium fire fuel calculator 060220 (2 pages)
Annex 9: Manufacturer's test instruction (3 pages)
Annex 10: Manufacturer's description of the stove (1 page)

Annex 11: Chimney configuration (1 page)
Annex 12: DTI test procedure EPA tests (26 pages) – CBI REPORT ONLY
Annex 13: Set of calibration certificates (79 pages)
Annex 14: HF1 ASTM calculations (11 pages)
Annex 15: LF ASTM calculations (11 pages)
Annex 16: HF2 ASTM calculations (11 pages)
Annex 17: MF ASTM calculations (11 pages)
Annex 18: Set of HF1 logger data 050220 (25 pages)
Annex 19: Set of LF logger data 050220 (68 pages)
Annex 20: Set of HF2 logger data 060220 (25 pages)

Annex 21: Set of MF logger data 060220 (65 pages)
Annex 22: Assembly drawings (9 pages) – CBI REPORT ONLY
Annex 23: Parts drawings (31 pages) – CBI REPORT ONLY
Annex 24: Material sheets (32 pages)
Annex 25: Labels (2 pages)
Annex 26: Pictures (2 pages)
Annex 27: User' manual (26 pages)
Annex 28: Sample analysis (4 pages)
Annex 29: Firebox drawing with volume (1 page)
Annex 30: Manufacturers QA Plan (8 pages)

Annex 1

Title: Alt-125 Acceptance letter of cordwood testing

Pages total: 3, excl this cover page



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 28 2018

Mr. Justin White
Hearthstone QHPP, Inc.
#17 Stafford Ave.
Morrisville, VT 05661

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

The following changes to ASTM E2515-11 must be followed:

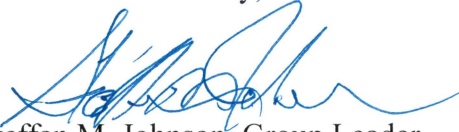
1. The filter temperature must be maintained between 80 and 90 degrees F during testing.
2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.
3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.
4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

A copy of this letter must be included in each certification test report where this alternative test method is utilized.

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at <http://www3.epa.gov/ttn/emc/approalt.html> for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,



Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD

Annex 2

Title: Documentation of aging 14. Nov 2019-30. Jan 2020


Pages total: 49, excl this cover page

Select Test Session Date: **14.11.2019**

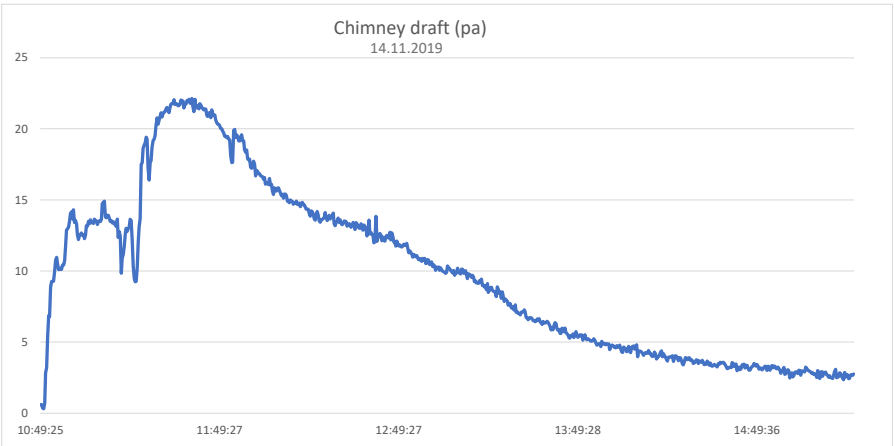
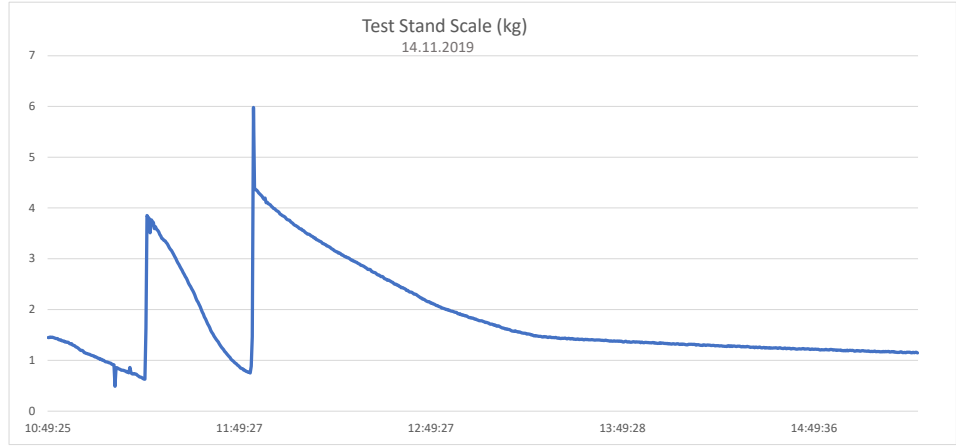
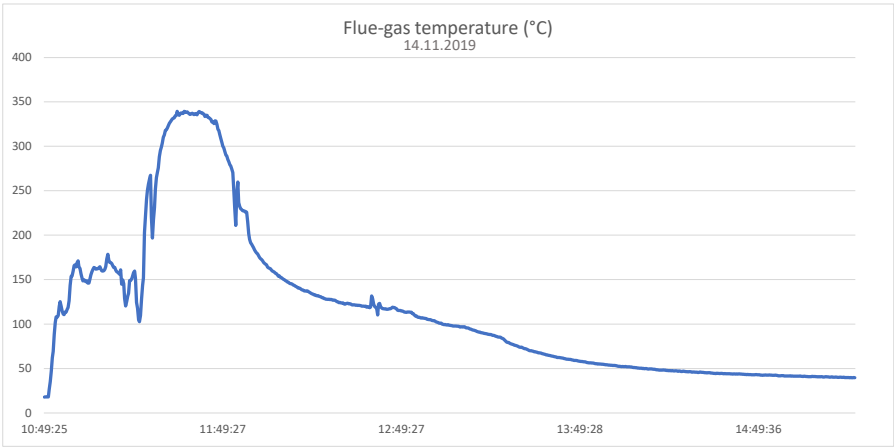
Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:51:05
 1.charge 11:20:06
 2.charge 11:53:06
 3.charge -
 4.charge -
 5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,845	16,5	-
1.Charge	3,200	18,3	5
2.charge	3,690	18,2	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **19.11.2019**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:46:02


1.charge 11:12:45

2.charge 12:20:48

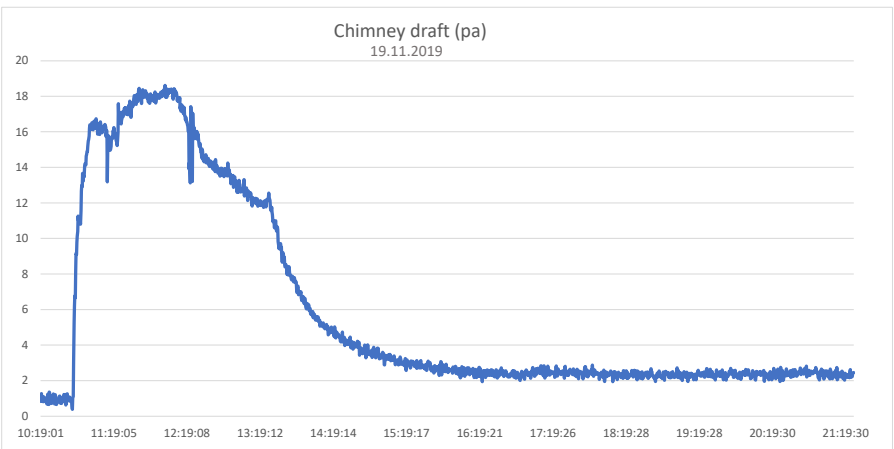
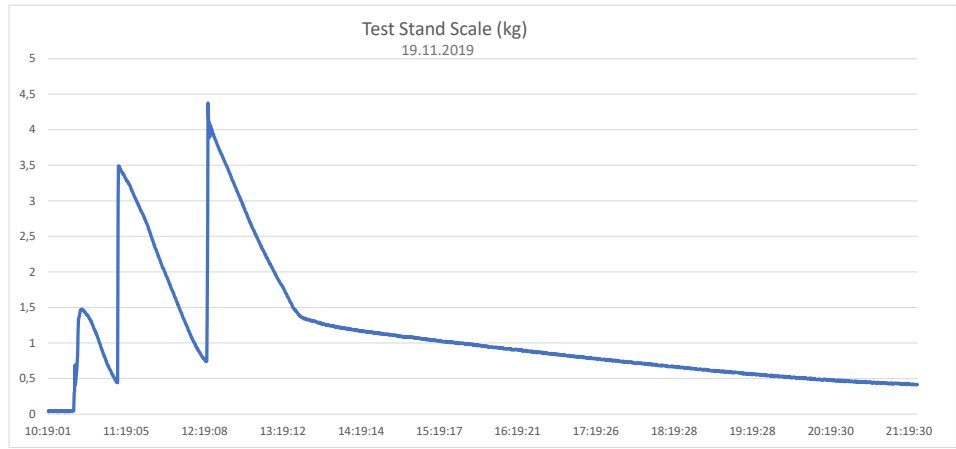
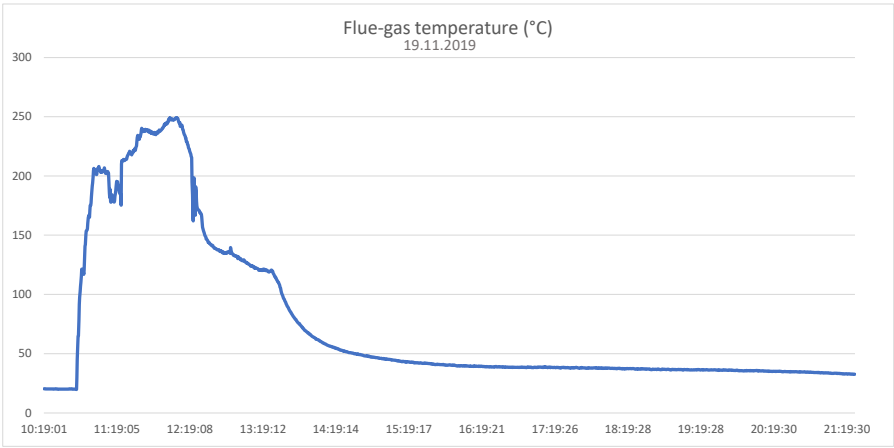
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,840	17,6	-
1.Charge	3,081	18,5	5
2.charge	3,468	16,2	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **20.11.2019**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 09:49:01


1.charge 10:24:02

2.charge 11:34:25

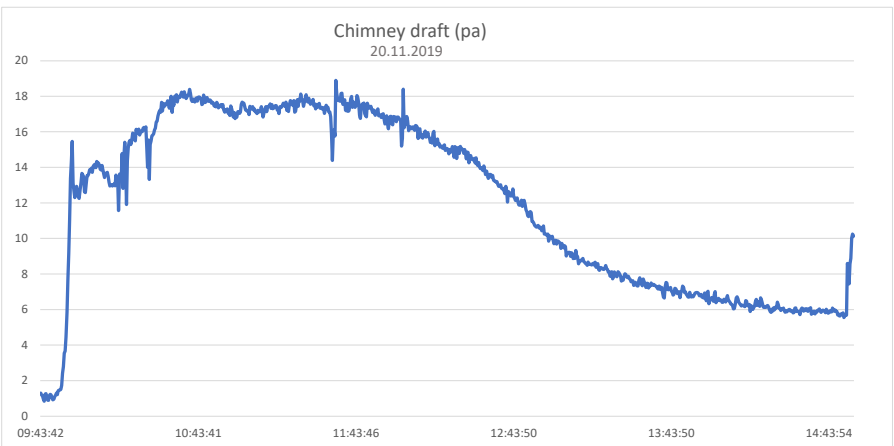
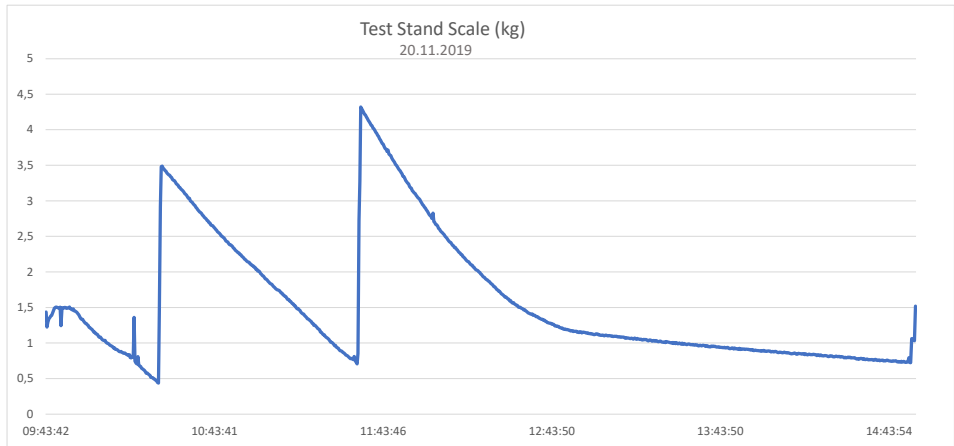
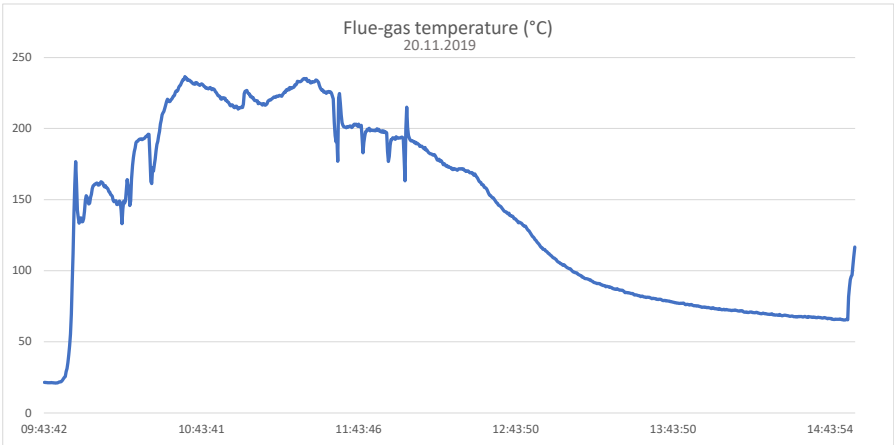
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,845	19	-
1.Charge	3,064	18,1	5
2.charge	3,678	18,8	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-




Select Test Session Date: **21.11.2019**

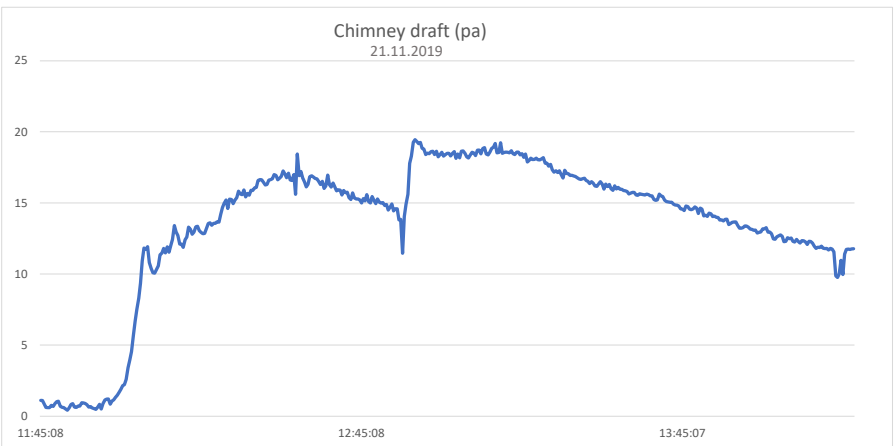
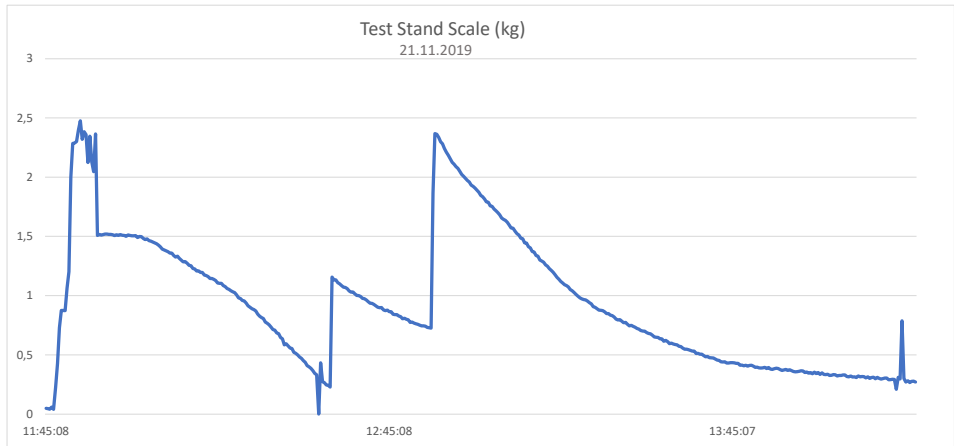
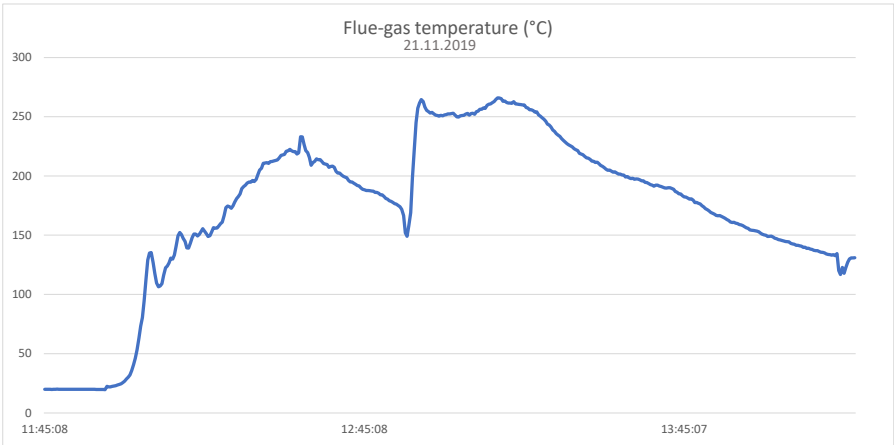
Kindling + Start-up load Time (hh:mm:ss) **11:56:47**

1.charge -
 2.charge -
 3.charge -
 4.charge -
 5.charge -

Wood species: Beech




	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,575	≈10	-
Start-up	0,855	16,8	-
1.Charge	-	-	-
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



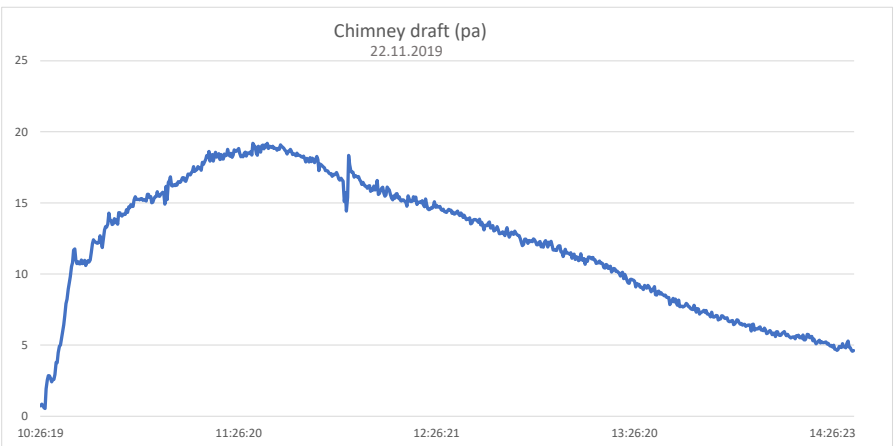
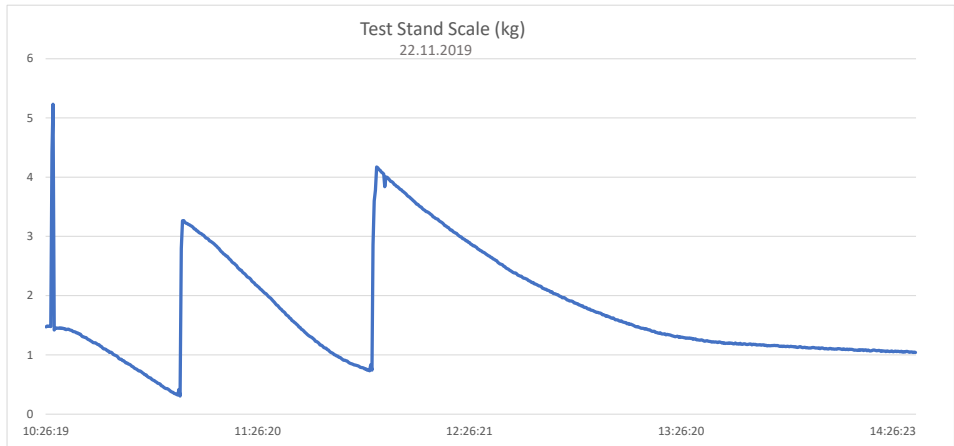
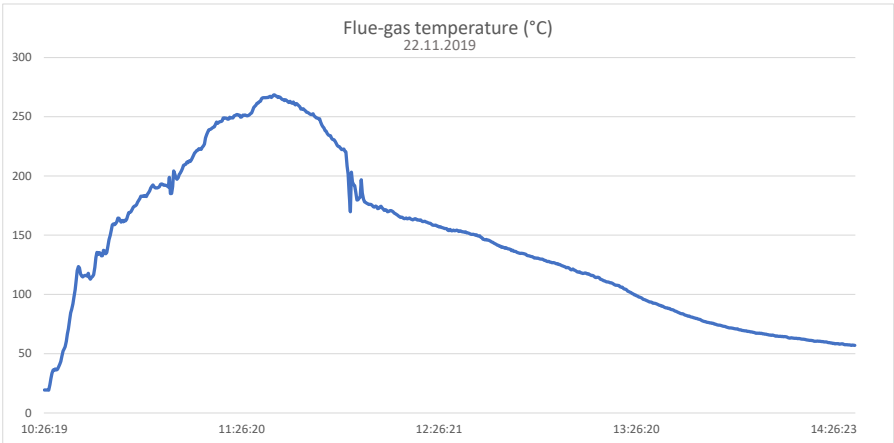
Select Test Session Date: **22.11.2019**

Wood species: Beech

	Time (hh:mm:ss)
Kindling + Start-up load	10:27:58
1.charge	11:03:59
2.charge	11:58:20
3.charge	-
4.charge	-
5.charge	-




	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,850	17	-
1.Charge	3,010	17,7	5
2 charge	3,534	17,8	5
3.Charge	-	-	-
4 charge	-	-	-
5.Charge	-	-	-

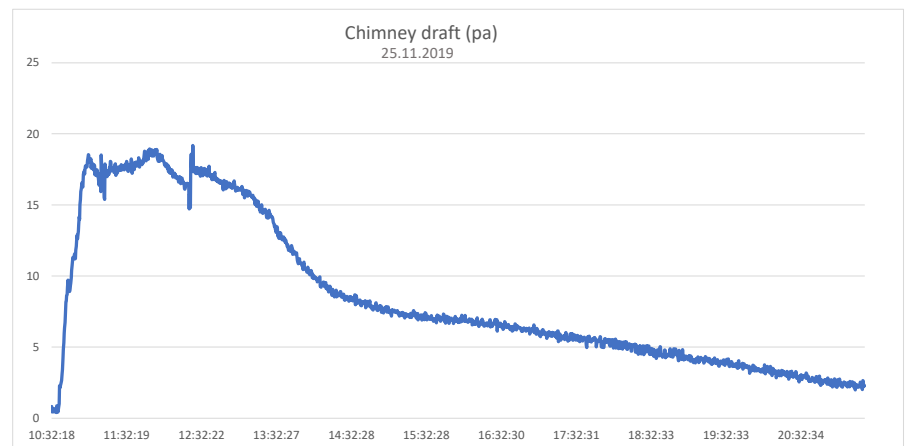
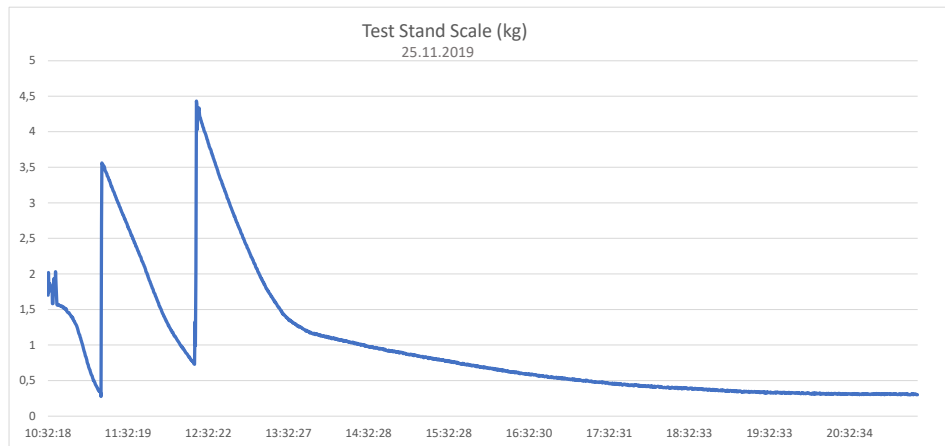
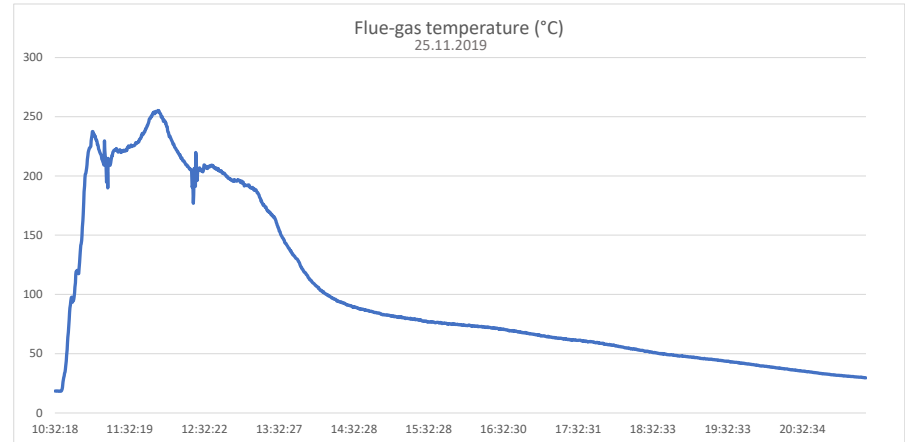


Select Test Session Date: **25.11.2019**

Wood species: Beech



	Time (hh:mm:ss)	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling + Start-up load	10:37:38	0,580	~10	-
1.charge	11:11:38	0,865	17	-
2.charge	12:22:22	3,300	17,8	5
3.charge	00:00:00	3,730	15,8	5
4.charge	-	-	-	-
5.charge	-	-	-	-



Select Test Session Date: **26.11.2019**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 11:58:41

1.charge 12:33:04


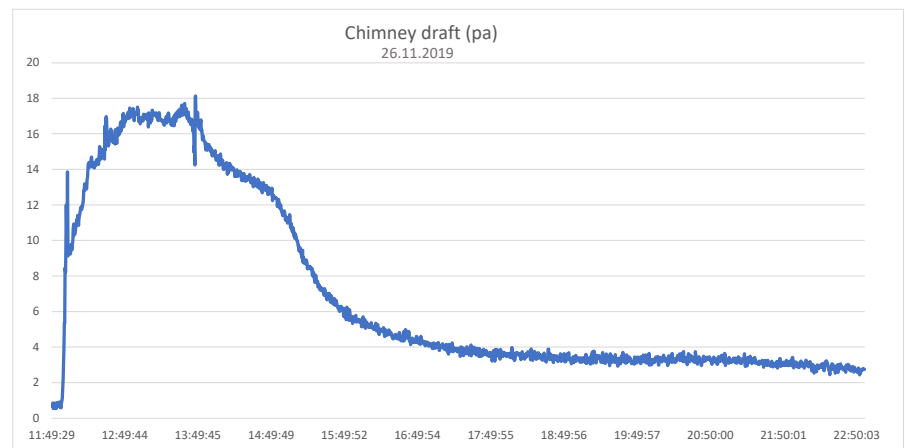
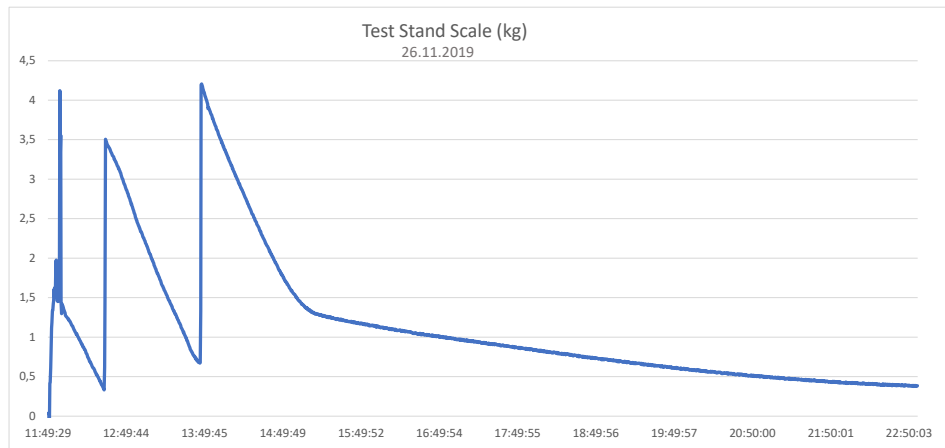
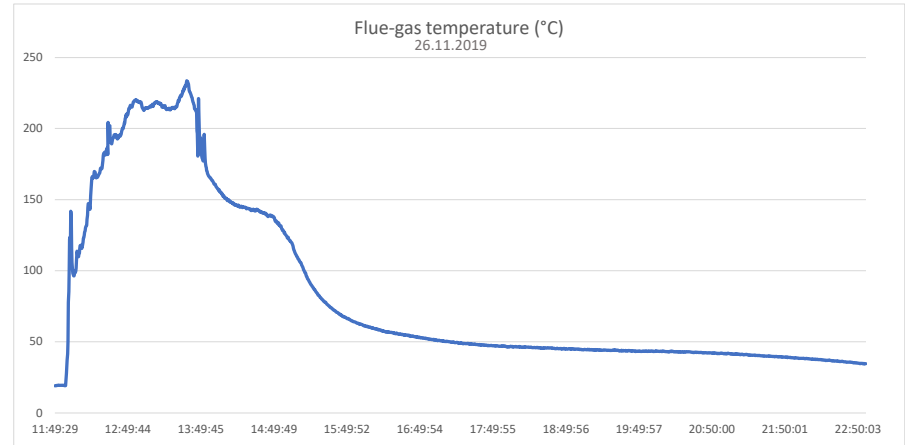
2.charge 13:46:24

3.charge -

4.charge -

5.charge -

	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,865	15,9	-
1.Charge	3,223	16,1	5
2.charge	3,594	17,4	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-

Select Test Session Date: **28.11.2019**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:47:27


1.charge 11:26:49

2.charge 12:47:29

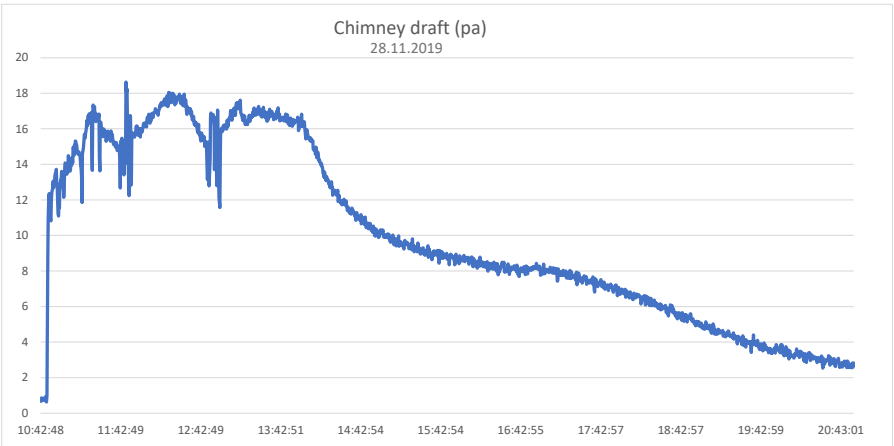
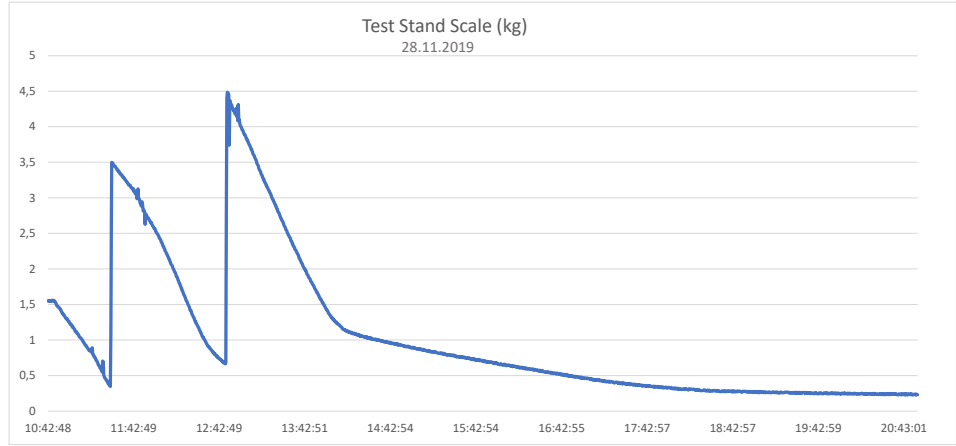
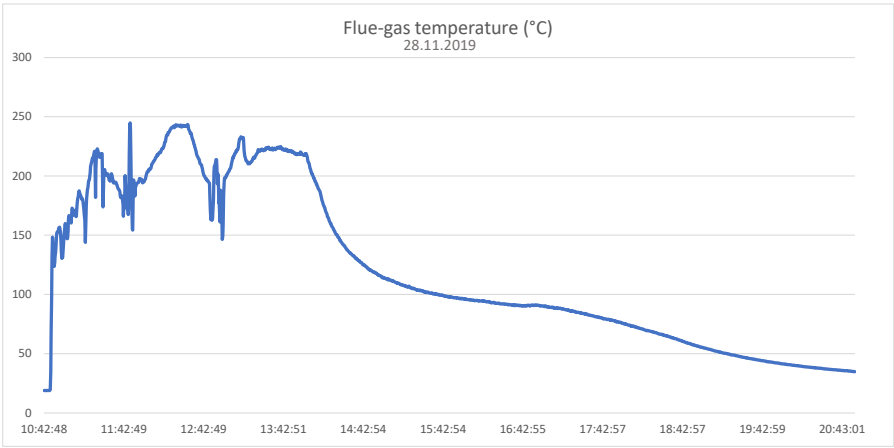
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,600	~10	-
Start-up	0,860	18,1	-
1.Charge	3,184	18,1	5
2.charge	3,872	18,9	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-




Select Test Session Date: **29.11.2019 part 1**

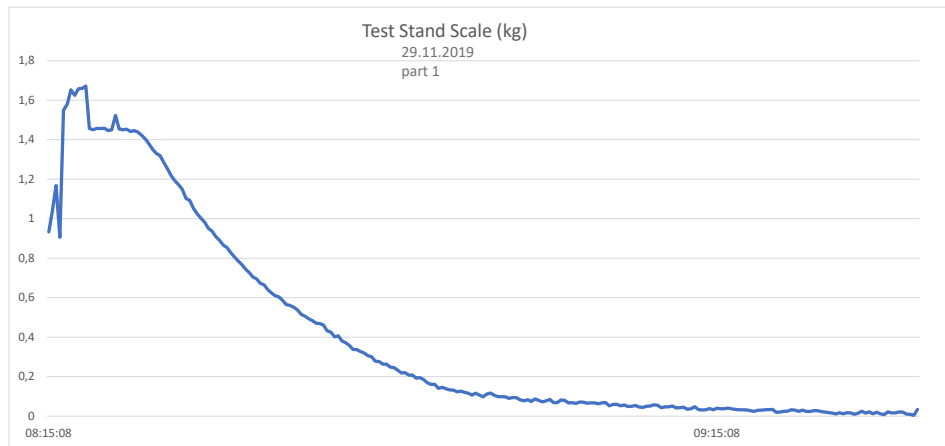
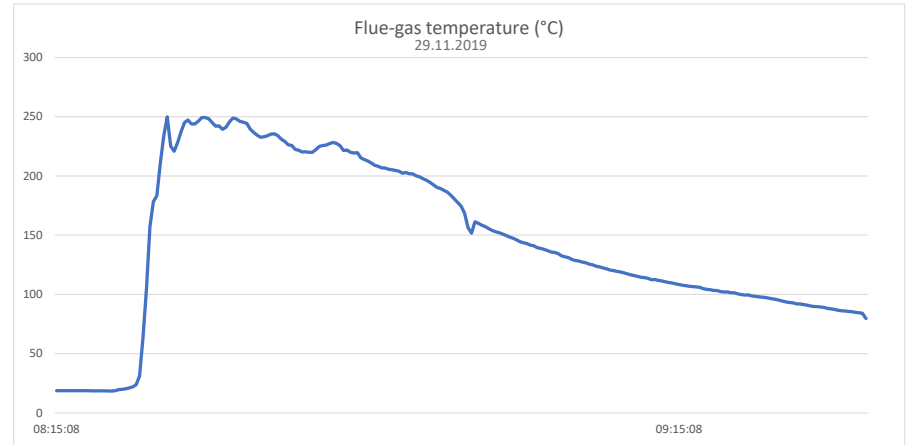
Kindling + Start-up load Time (hh:mm:ss) **08:20:27**

1.charge -
 2.charge -
 3.charge -
 4.charge -
 5.charge -

Wood species: Beech



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	≈10	-
Start-up	0,833	19	-
1.Charge	-	-	-
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **29.11.2019 Part 2**

Kindling + Start-up load Time (hh:mm:ss) 10:55:23

1.charge -


2.charge -

3.charge -

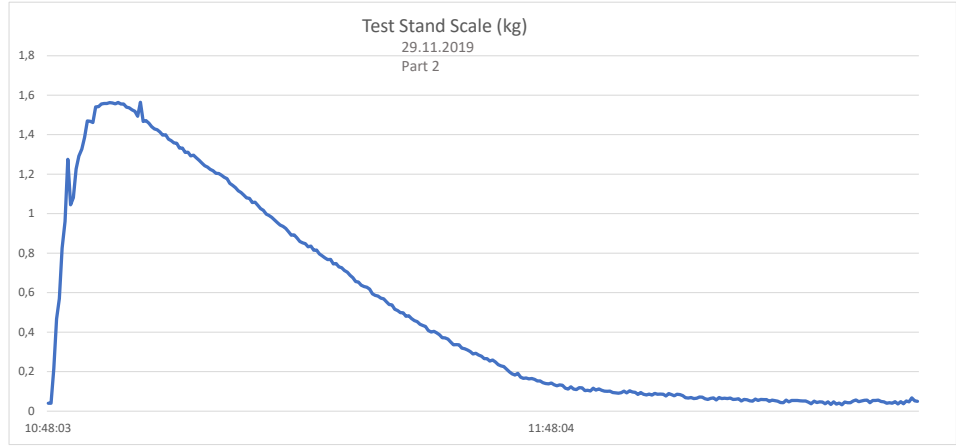
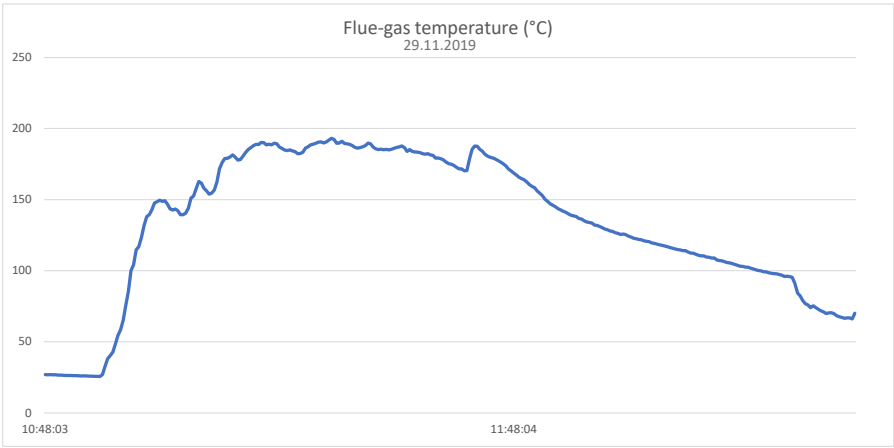
4.charge -

5.charge -

Wood species: Beech



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,538	~10	-
Start-up	0,851	17,7	-
1.Charge	-	-	-
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **03.12.2019**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 10:13:21


1.charge 10:44:40

2.charge 11:43:40

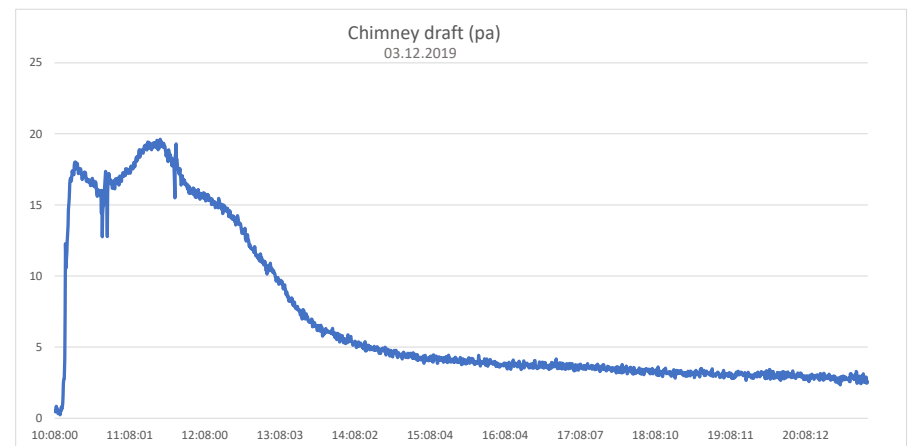
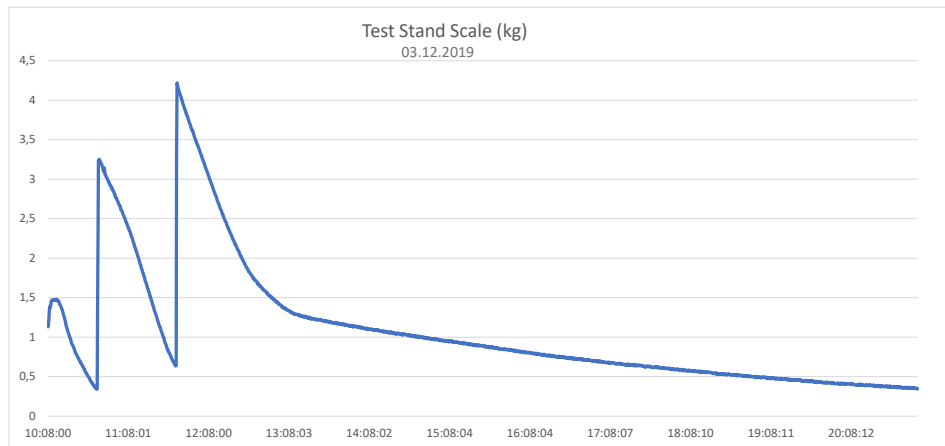
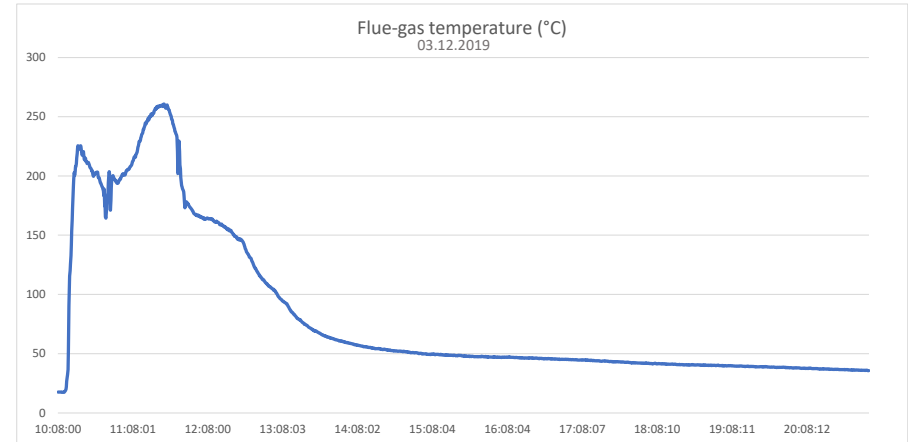
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,512	~10	-
Start-up	0,840	19,3	-
1.Charge	2,948	17,2	5
2.charge	3,572	17,9	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **04.12.2019**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:46:08


1.charge 11:13:49

2.charge 12:26:33

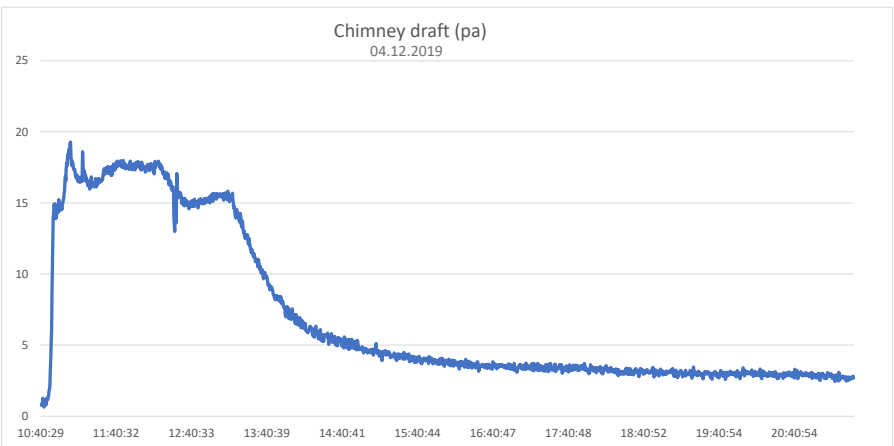
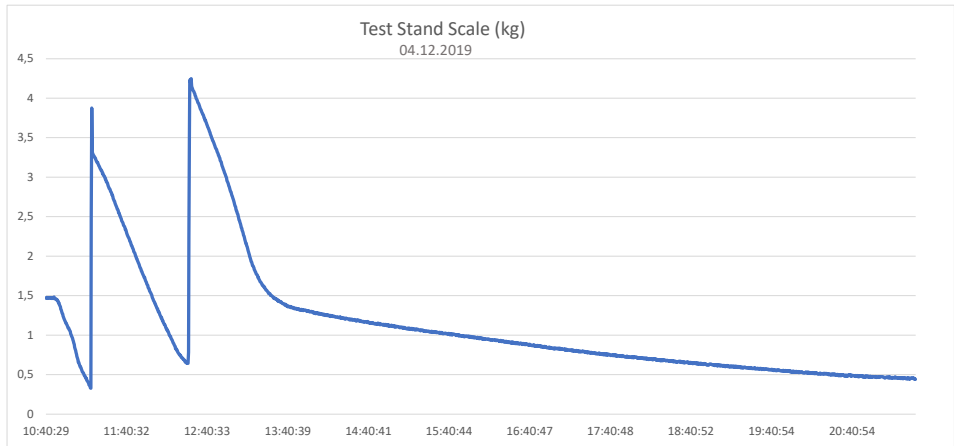
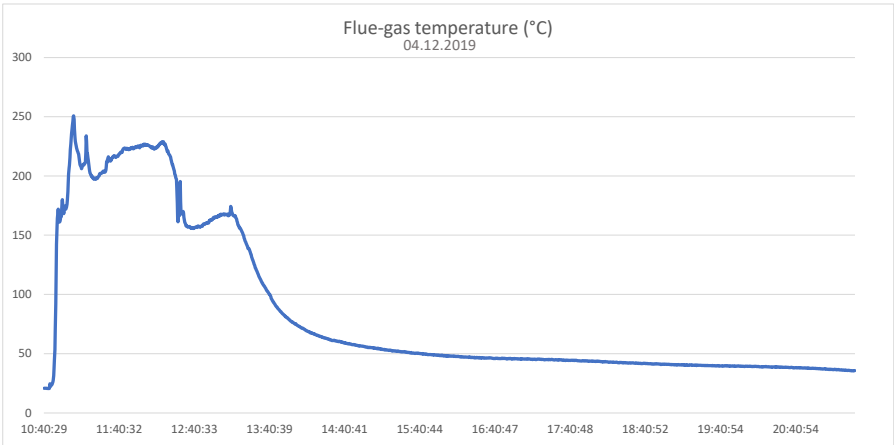
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,540	~10	-
Start-up	0,850	18,4	-
1.Charge	3,046	18,4	5
2.charge	3,608	16,9	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **05.12.2019**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 09:45:31


1.charge 10:18:31

2.charge 11:01:15

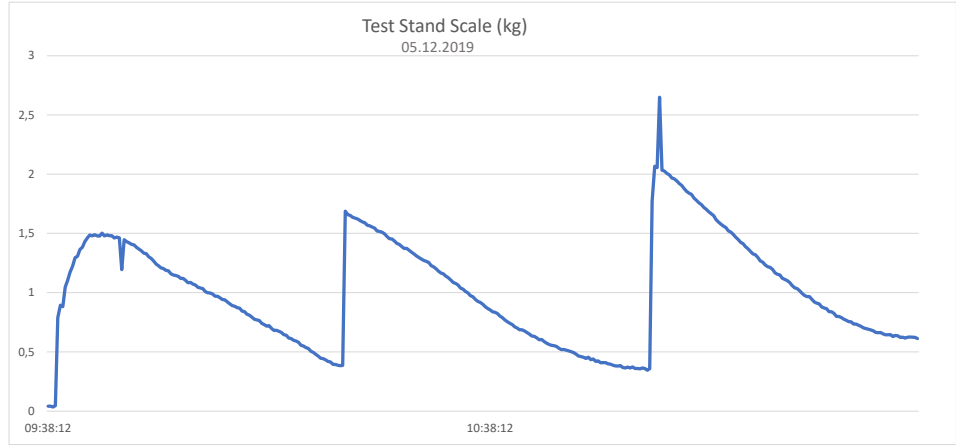
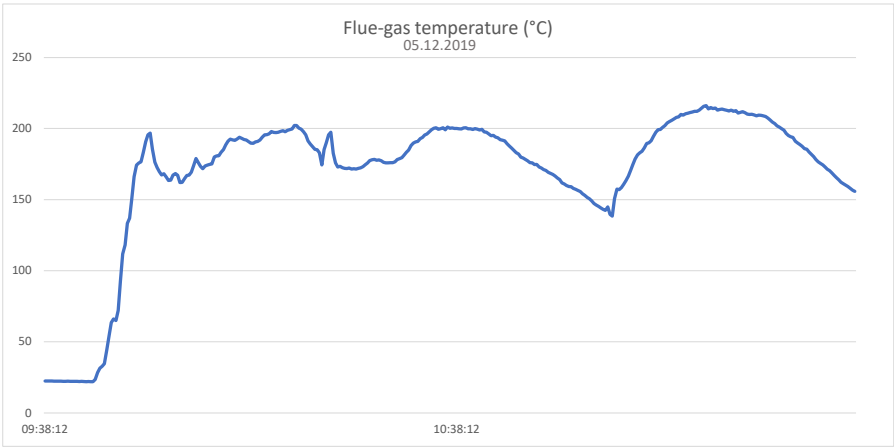
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,570	~10	-
Start-up	0,840	15,9	-
1.Charge	1,322	16,2	7
2 charge	1,726	16,3	8
3.Charge	-	-	-
4 charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **10.12.2019**

Wood species: Beech

Kindling + Start-up load 10:44:11


1.charge 11:12:31

2.charge 12:10:54

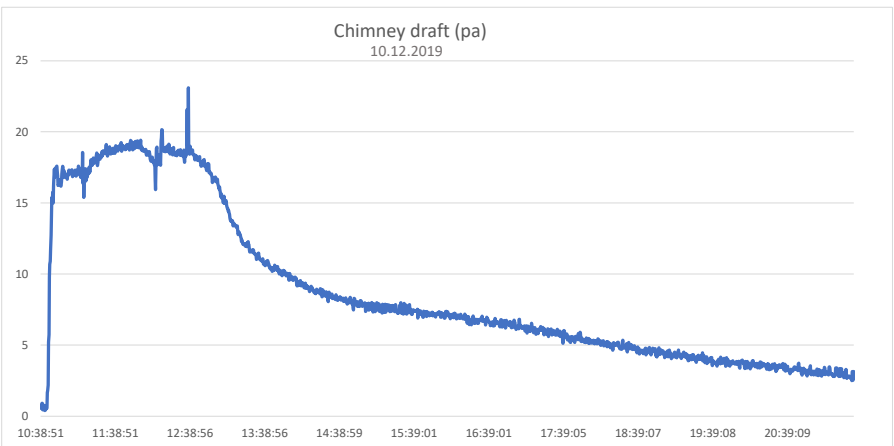
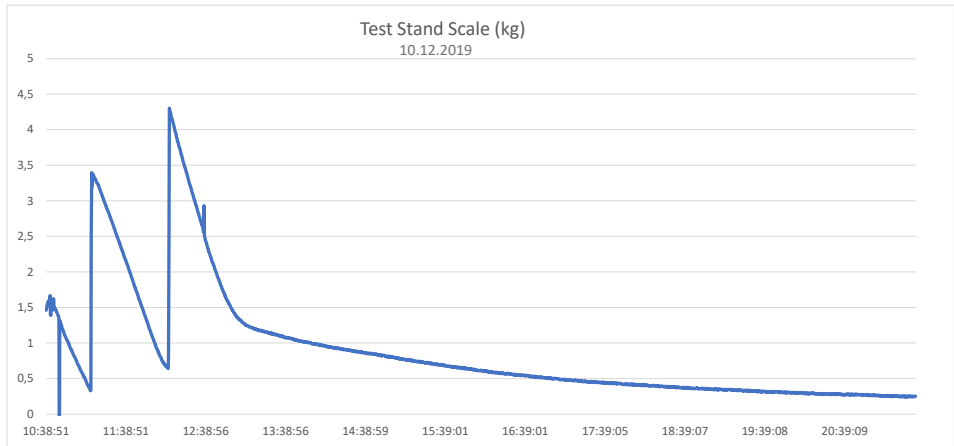
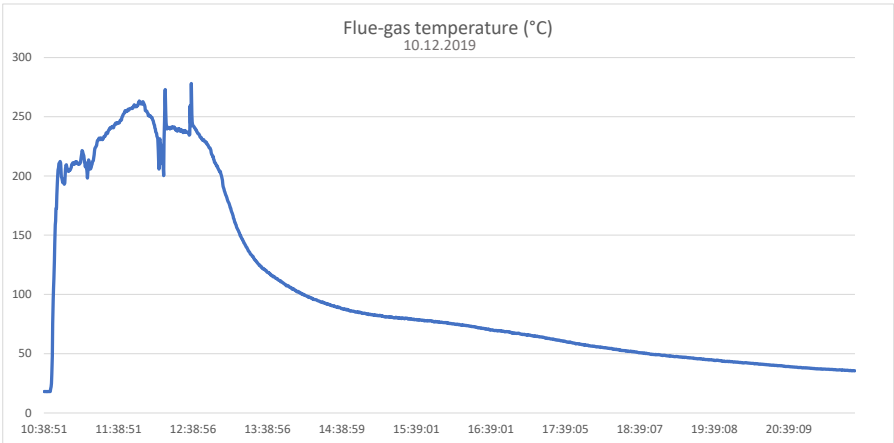
3.charge -

4.charge -

5.charge -




	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,835	18	-
1.Charge	3,112	17,5	5
2 charge	3,680	17,5	5
3.Charge	-	-	-
4 charge	-	-	-
5.Charge	-	-	-

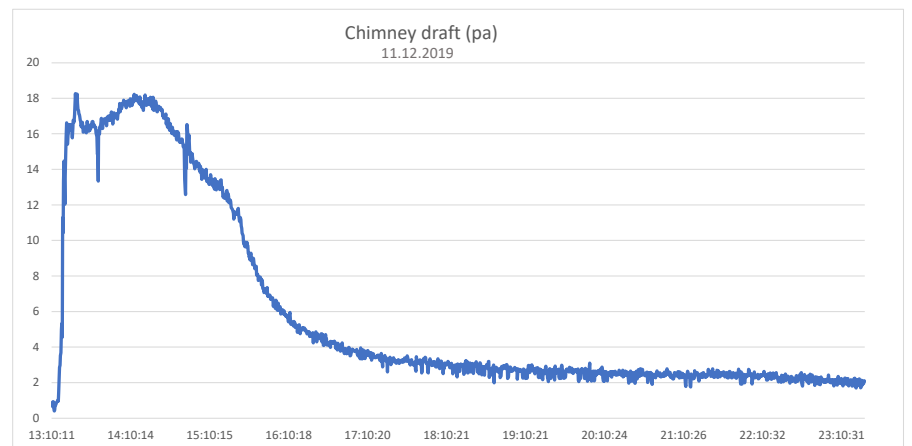
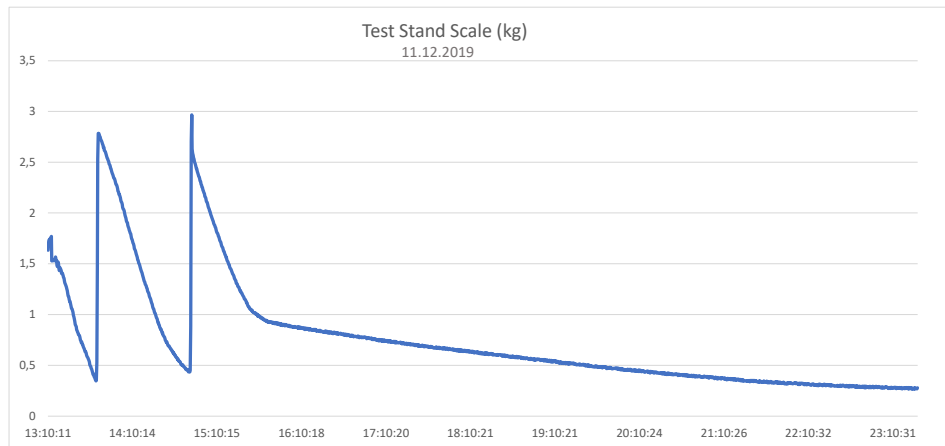
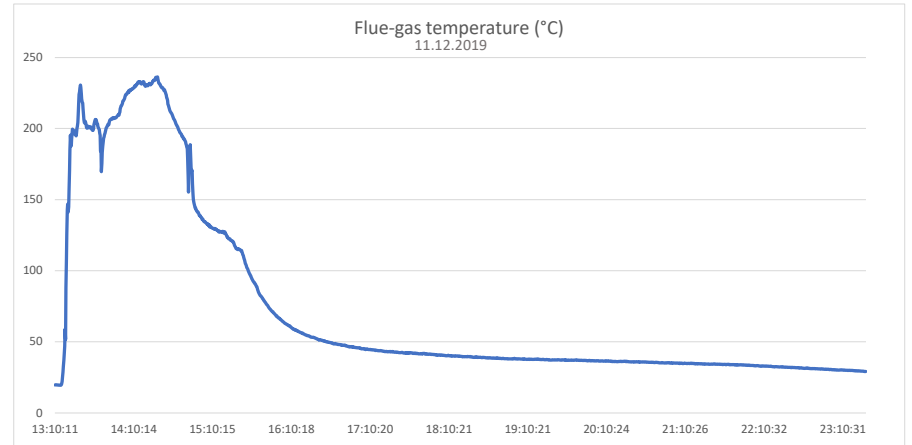


Select Test Session Date: **11.12.2019**

Wood species: Beech



	Time (hh:mm:ss)	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling + Start-up load	13:15:31	0,580	~10	-
1.charge	13:44:55	0,860	16,9	-
2.charge	14:51:16	2,486	17,7	5
3.charge	-	2,220	17,9	5
4.charge	-	-	-	-
5.charge	-	-	-	-



Select Test Session Date: **12.12.2019**

Kindling + Start-up load Time (hh:mm:ss) 13:11:21

1.charge 13:53:21


2.charge -

3.charge -

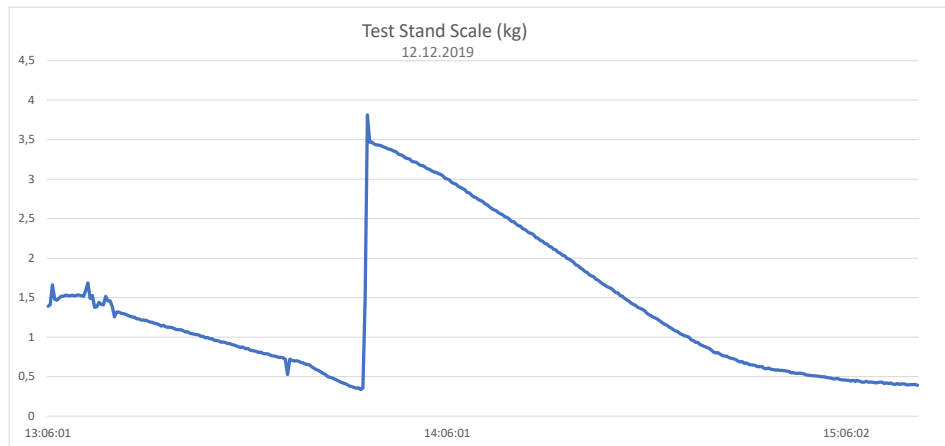
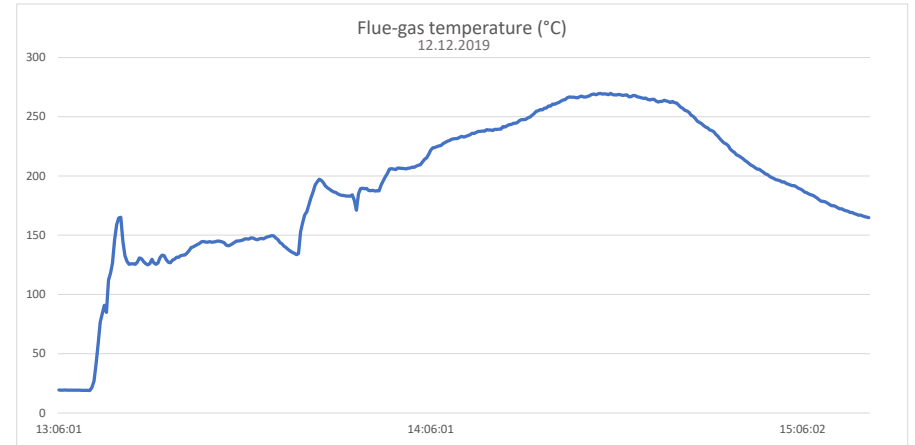
4.charge -

5.charge -

Wood species: Beech



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	≈10	-
Start-up	0,850	20,1	-
1.Charge	3,195	19,8	5
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **13.12.2019**


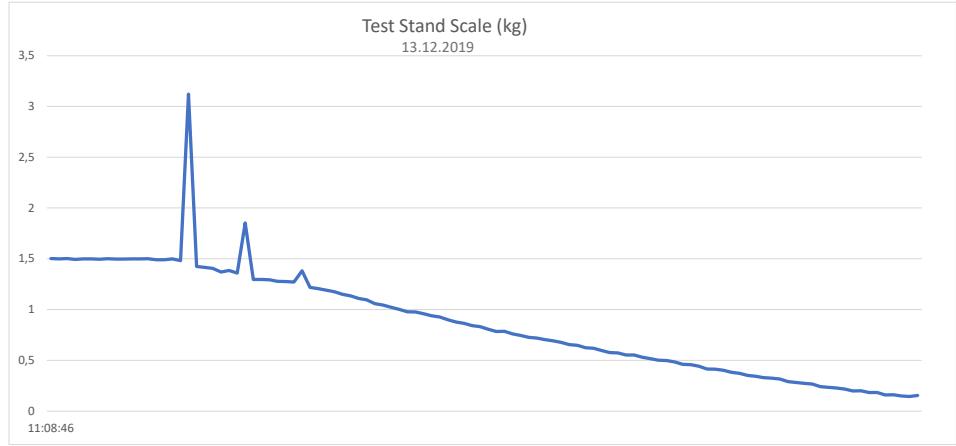
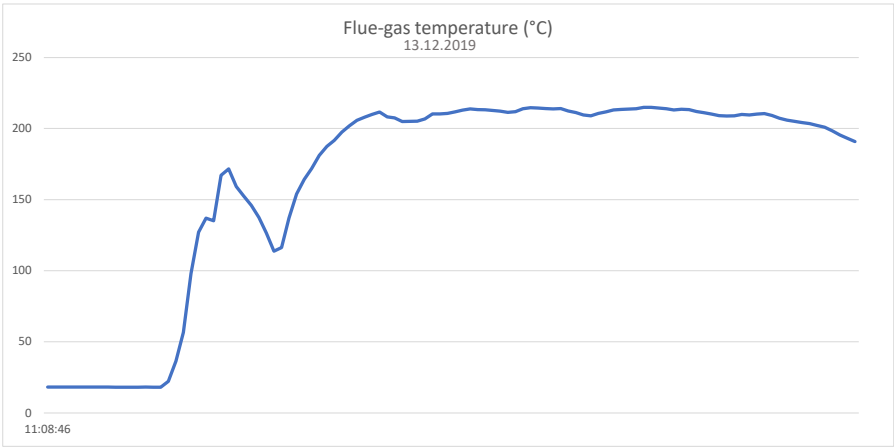
Time (hh:mm:ss) **11:14:05**

Wood species: **Beech**

Kindling + Start-up load **11:14:05**

1.charge -
 2.charge -
 3.charge -
 4.charge -
 5.charge -

	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,850	21	-
1.Charge	-	-	-
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-

Select Test Session Date: **16.12.2019**

Time (hh:mm:ss) **10:02:22** Wood species: Beech

Kindling + Start-up load 10:02:22


1.charge 10:33:26

2.charge 11:32:18

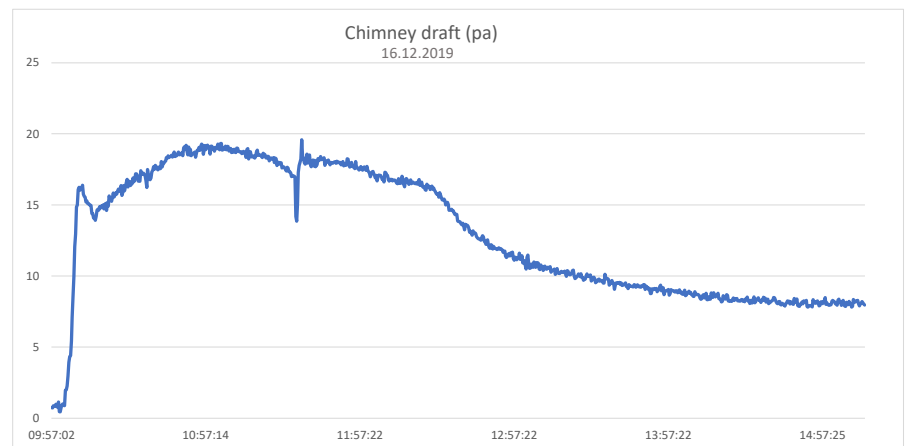
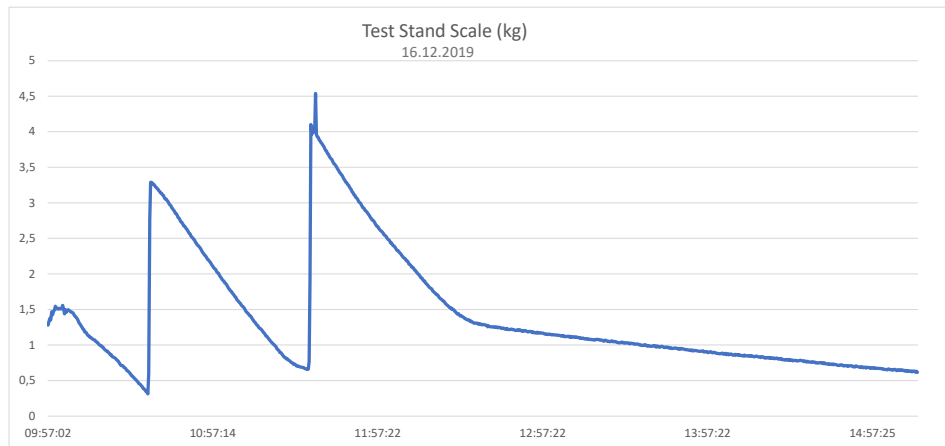
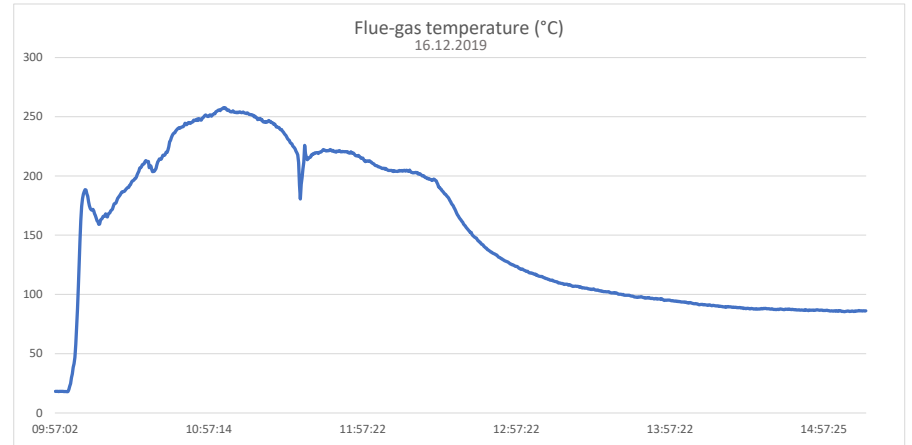
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,860	20,5	-
1.Charge	3,024	19,8	5
2.charge	3,458	19,9	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **17.12.2019**

Wood species: Beech

Kindling + Start-up load 10:48:02


1.charge 11:23:03

2.charge 13:05:08

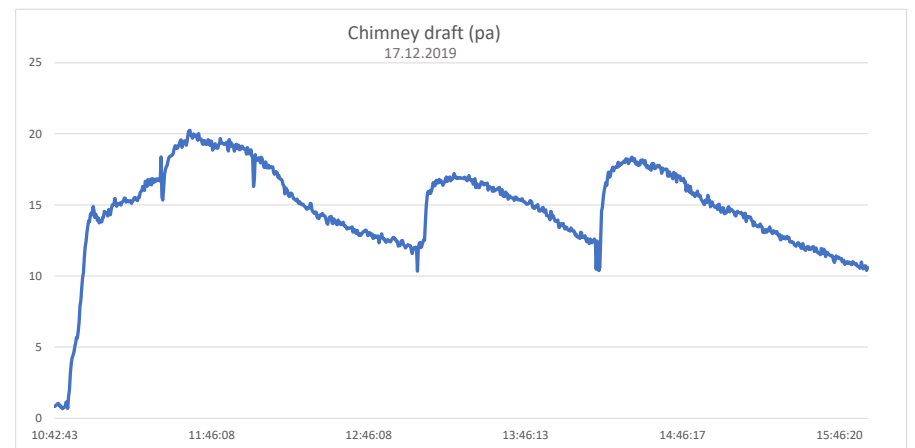
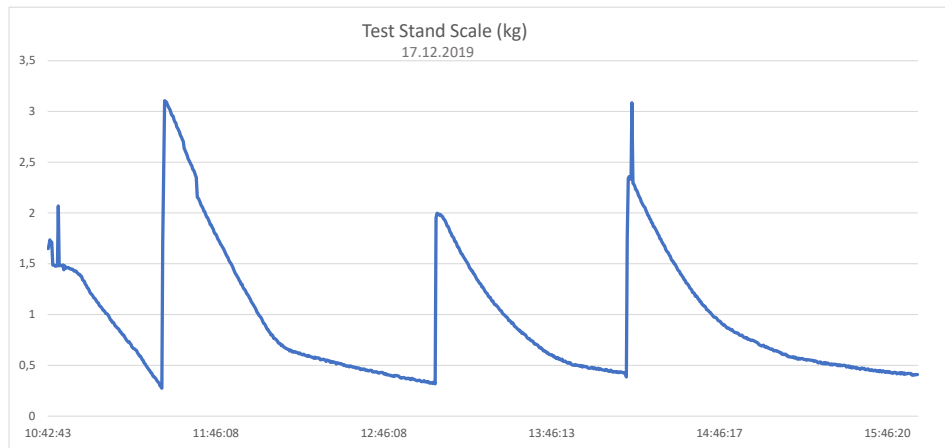
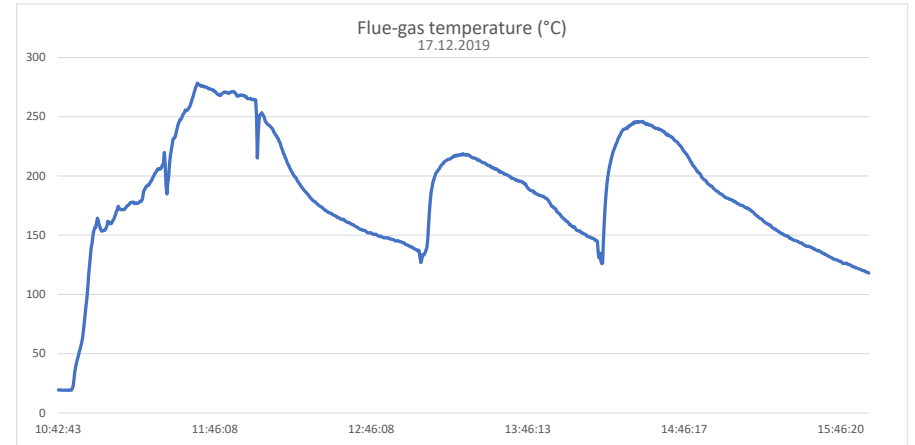
3.charge 14:13:13

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,850	17,9	-
1.Charge	2,900	17,9	10
2.charge	2,682	17,9	2
3.Charge	1,933	18,1	2
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **18.12.2019**

Wood species: Beech

Kindling + Start-up load 11:10:44

1.charge 11:44:46

2.charge 13:59:32

3.charge 15:28:21

4.charge -

5.charge -

Time (hh:mm:ss)

weight (kg) moisture (wet basis %) No. of pieces

Kindling 0,550 ~10 -

Start-up 0,850 18,2 -


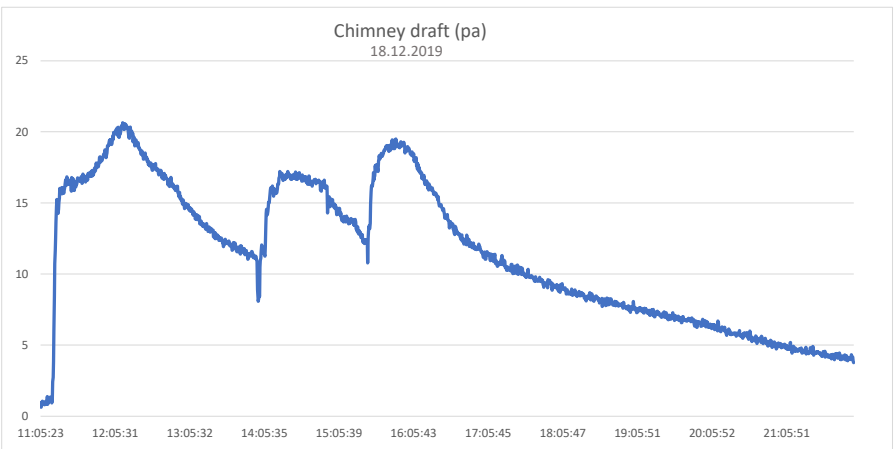
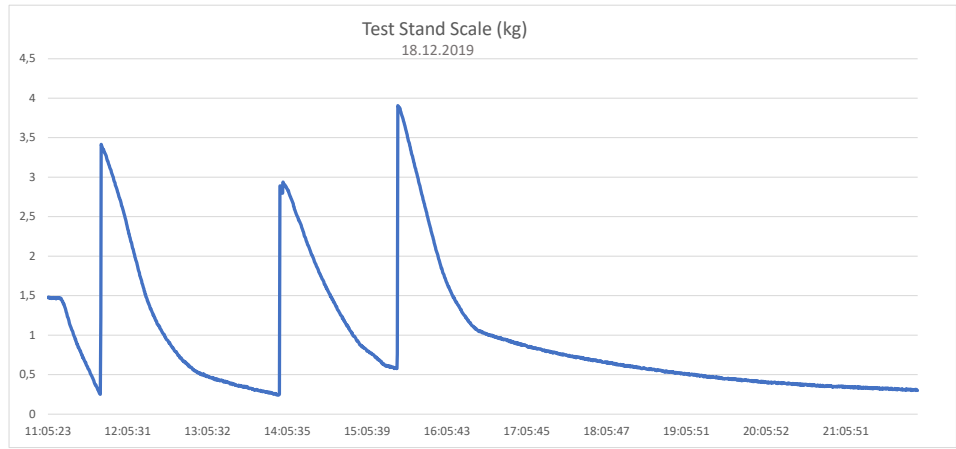
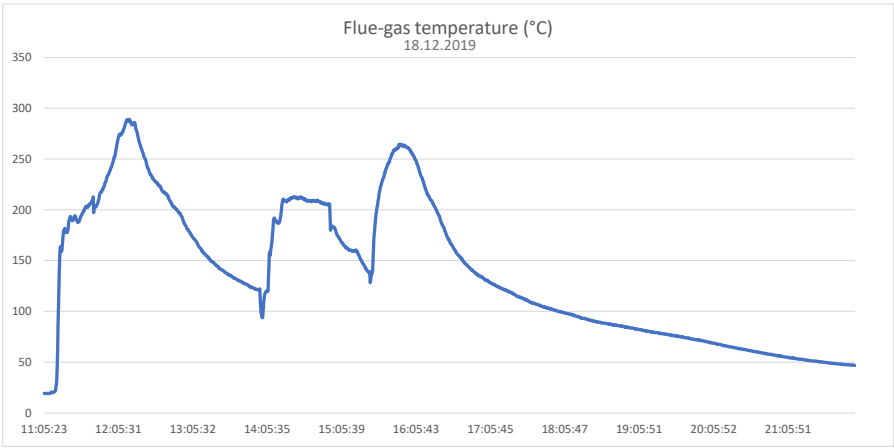
1.Charge 3,200 18,3 5

2.charge 2,632 18,2 2

3.Charge 3,335 18,5 5

4.charge - - -

5.Charge - - -

Select Test Session Date: **19.12.2019 part 1**


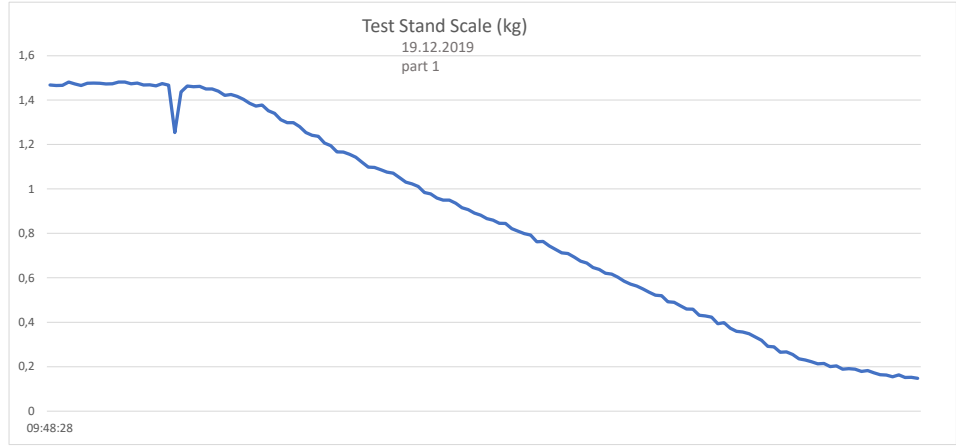
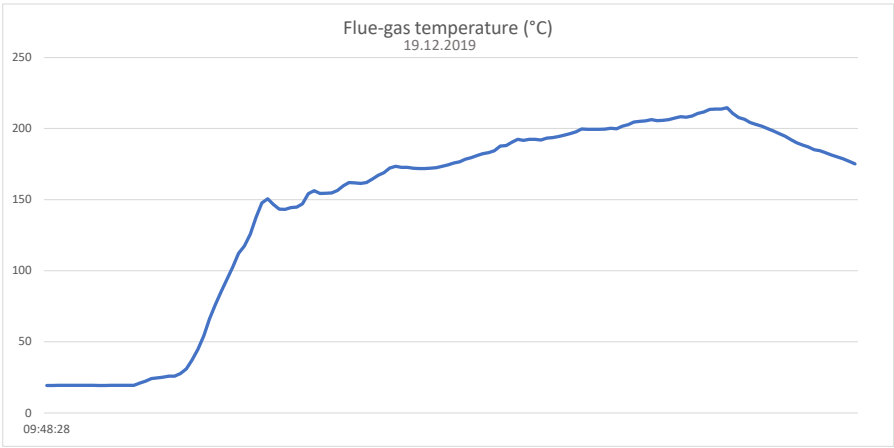
Kindling + Start-up load Time (hh:mm:ss) 09:53:47

1.charge -
 2.charge -
 3.charge -
 4.charge -
 5.charge -

Weight (kg) moisture (wet basis %) No. of pieces

Kindling 0,590 ≈10 -
 Start-up 0,830 17,9 -
 1.Charge - - -
 2.charge - - -
 3.Charge - - -
 4.charge - - -
 5.Charge - - -

Wood species: Beech

Select Test Session Date: **19.12.2019 part 2**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 13:07:01


1.charge 13:42:20

2.charge 15:10:44

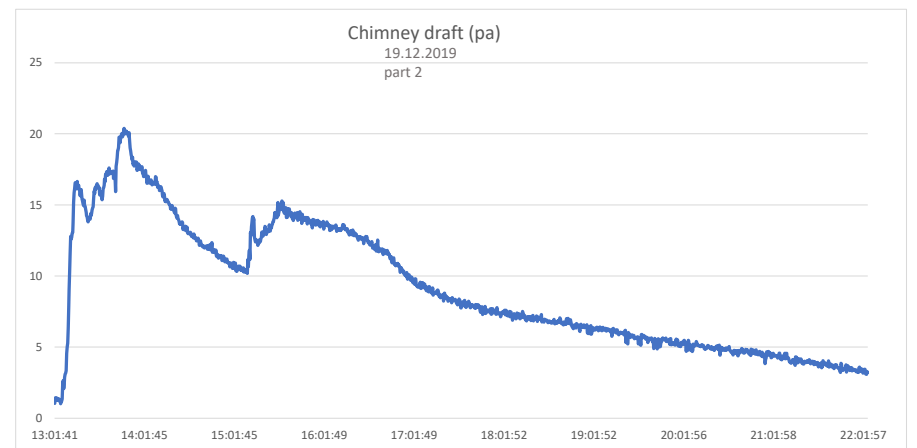
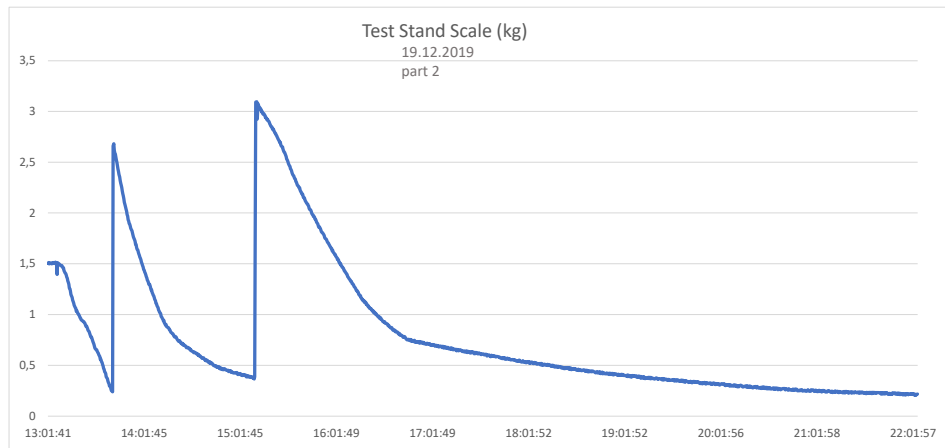
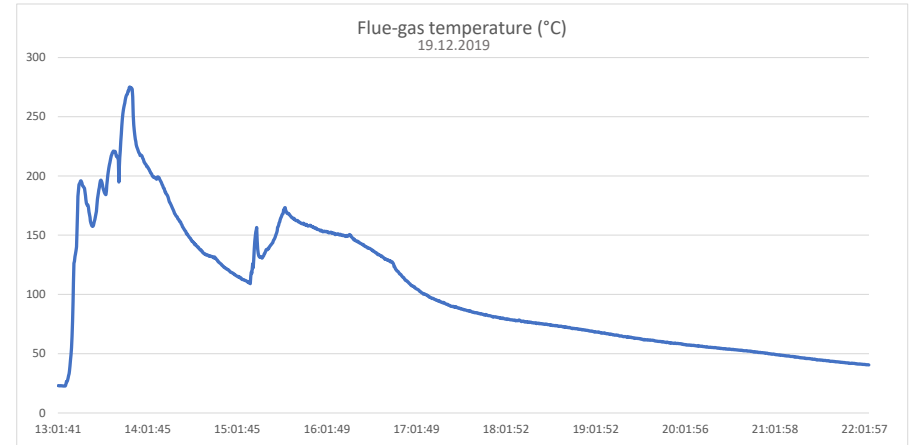
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,590	~10	-
Start-up	0,860	21	-
1.Charge	2,442	19,1	2
2.charge	2,740	19,5	3
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **13.01.2020**

Kindling + Start-up load Time (hh:mm:ss) 11:26:53

1.charge 11:55:54


2.charge 13:09:33

3.charge -

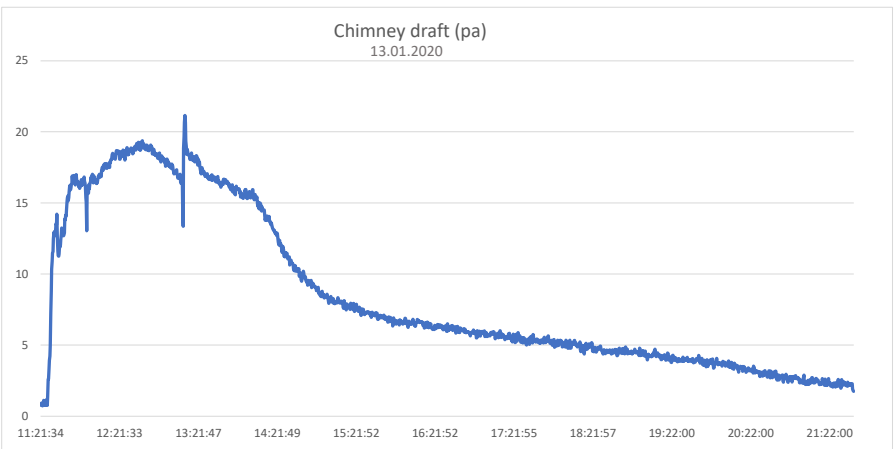
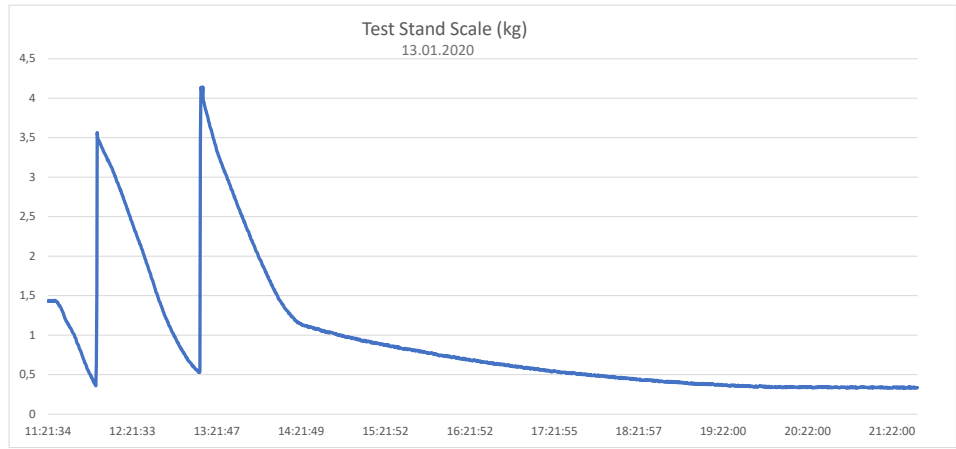
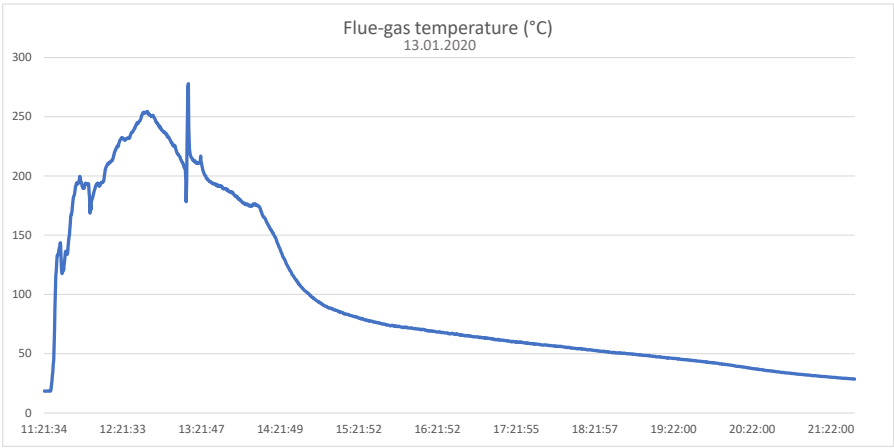
4.charge -

5.charge -

Wood species: Beech



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,523	≈10	-
Start-up	0,850	20,9	-
1.Charge	3,175	20,6	5
2.charge	3,652	19,9	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **14.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 08:20:45


1.charge 08:57:25

2.charge 10:11:05

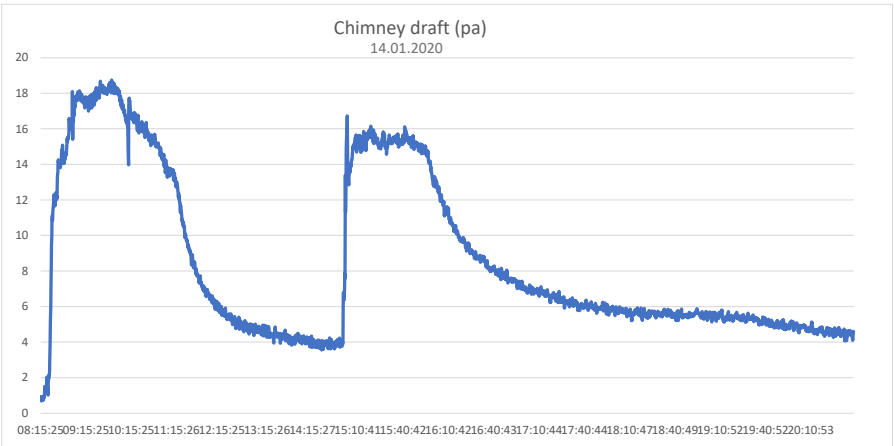
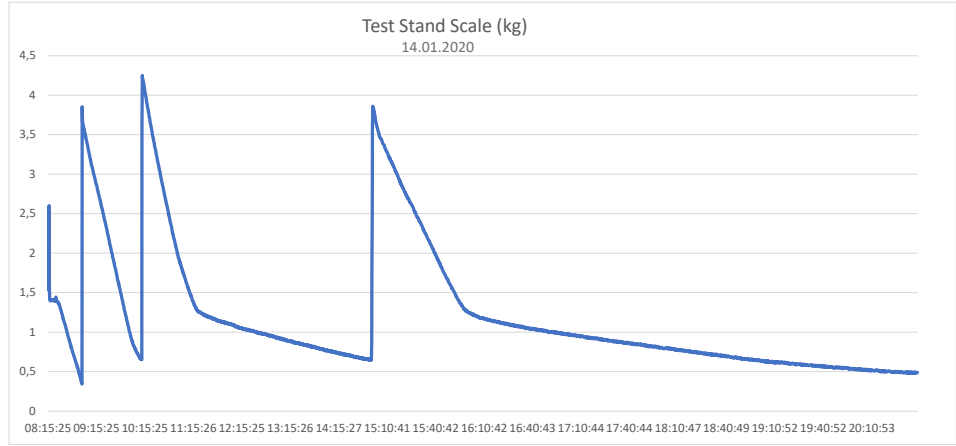
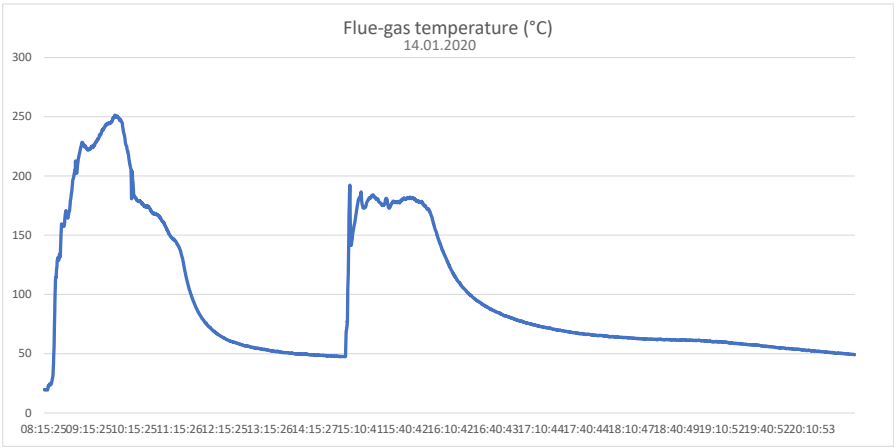
3.charge 14:57:47

4.charge 00:00:00

5.charge 00:00:00



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,589	~10	-
Start-up	0,760	20	-
1.Charge	3,367	18,9	5
2.charge	3,654	18,9	5
3.Charge	3,212	19,1	4
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **15.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:14:06


1.charge 10:56:25

2.charge 12:24:48

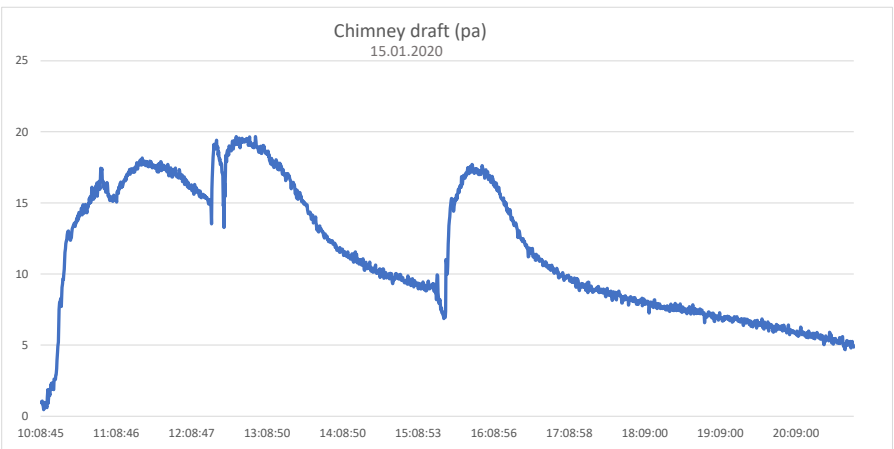
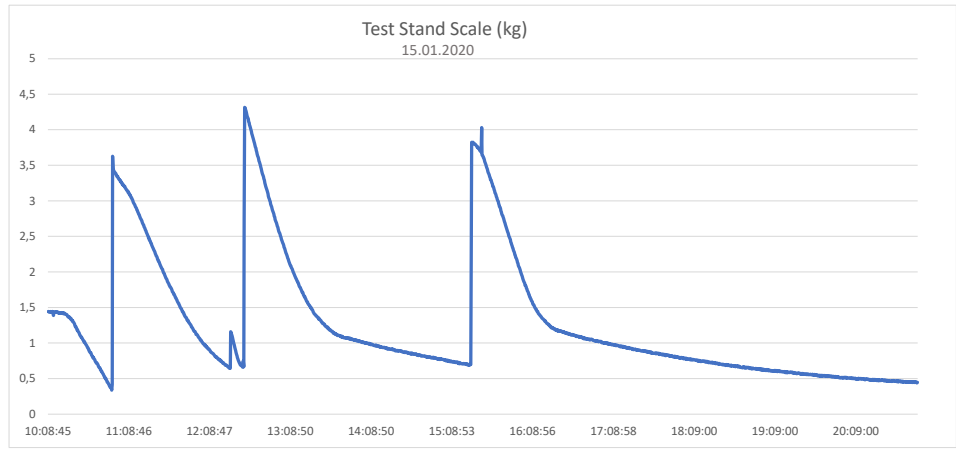
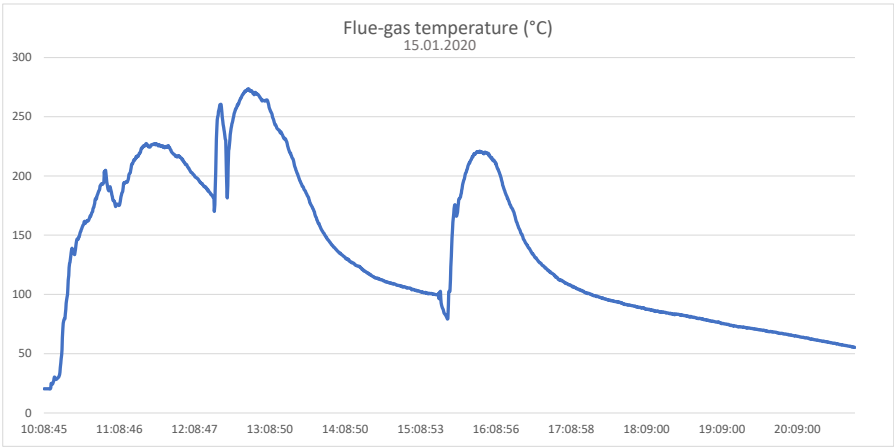
3.charge 12:33:47

4.charge 15:23:17

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,810	16,9	-
1.Charge	3,166	19,8	5
2.charge	0,524	15,8	7
3.Charge	3,680	16,2	5
4.charge	3,136	-	6
5.Charge	-	-	-



Select Test Session Date: **16.01.2020**

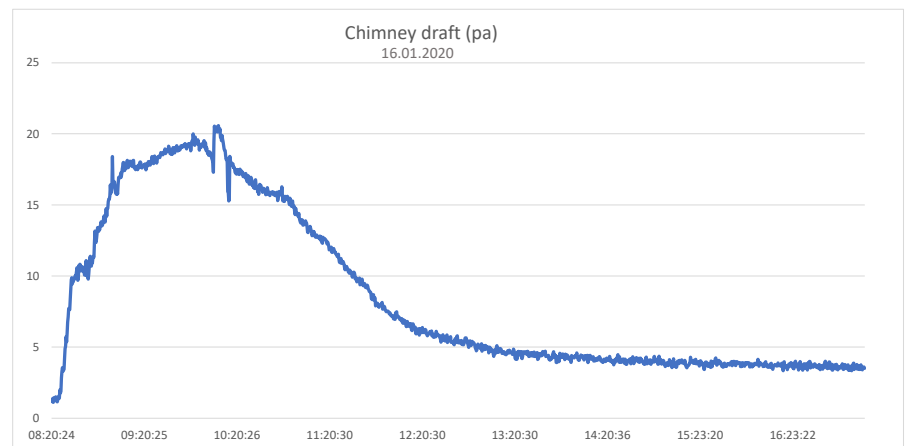
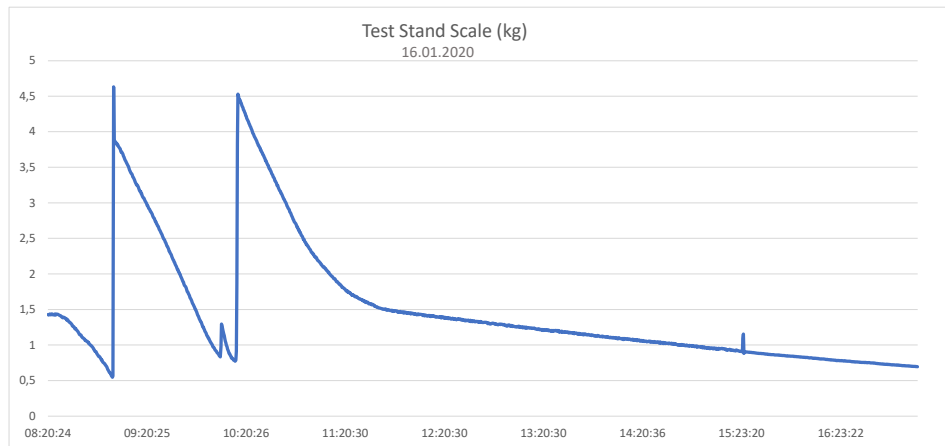
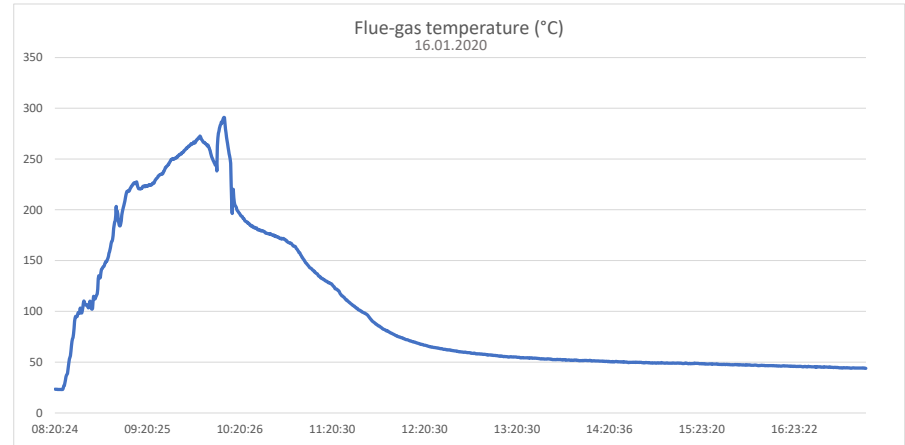
Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 08:25:44
 1.charge 08:59:44
 2.charge 10:05:26
 3.charge 10:14:27
 4.charge -
 5.charge -

weight (kg) moisture (wet basis %) No. of pieces

Kindling 0,579 ~10 -
 Start-up 0,800 17,1 -
 1.Charge 3,429 17,8 5
 2.charge 0,480 17,9 8
 3.Charge 3,780 16,9 5
 4.charge - - -
 5.Charge - - -

Select Test Session Date: **17.01.2020**

Wood species: Beech

Kindling + Start-up load: 10:44:04

1.charge: 11:12:44


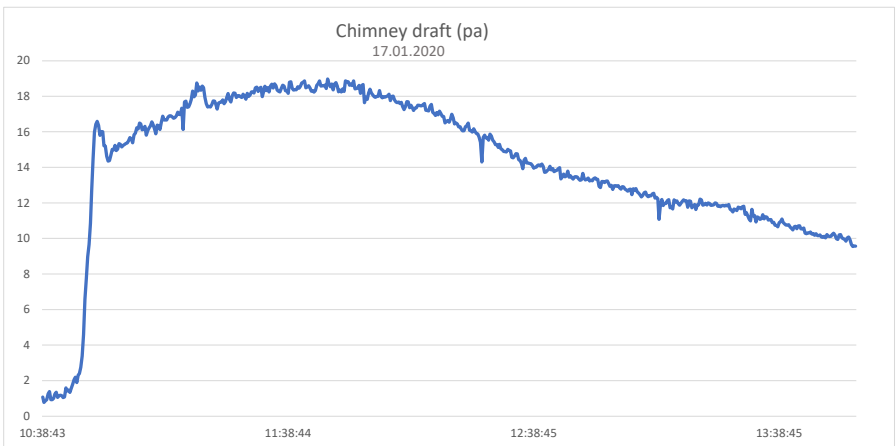
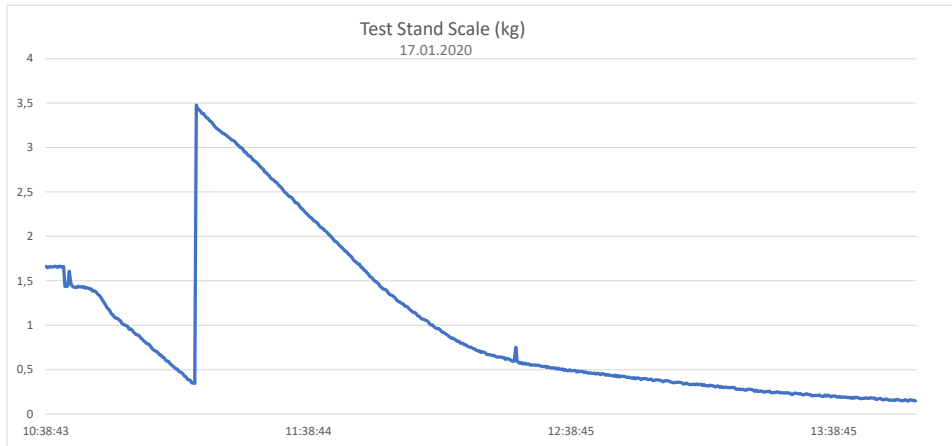
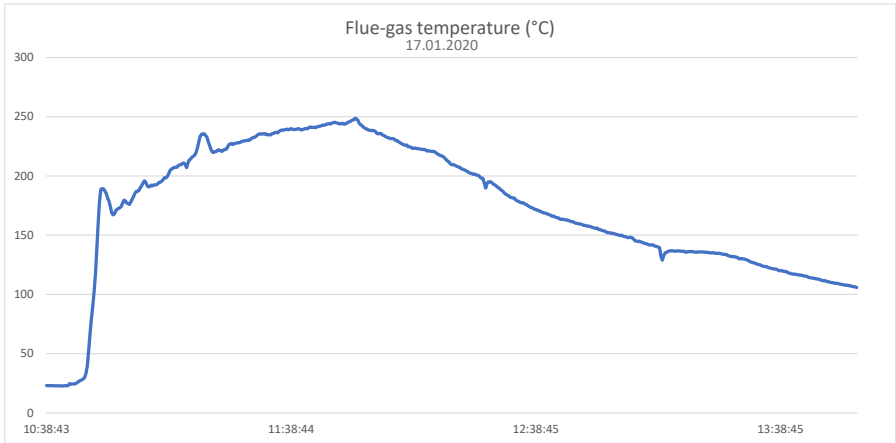
2.charge: -

3.charge: -

4.charge: -

5.charge: -

	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,579	~10	-
Start-up	0,806	16,9	-
1.Charge	3,147	16,9	5
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-

Select Test Session Date: **20.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 11:10:09


1.charge 11:52:49

2.charge 13:07:09

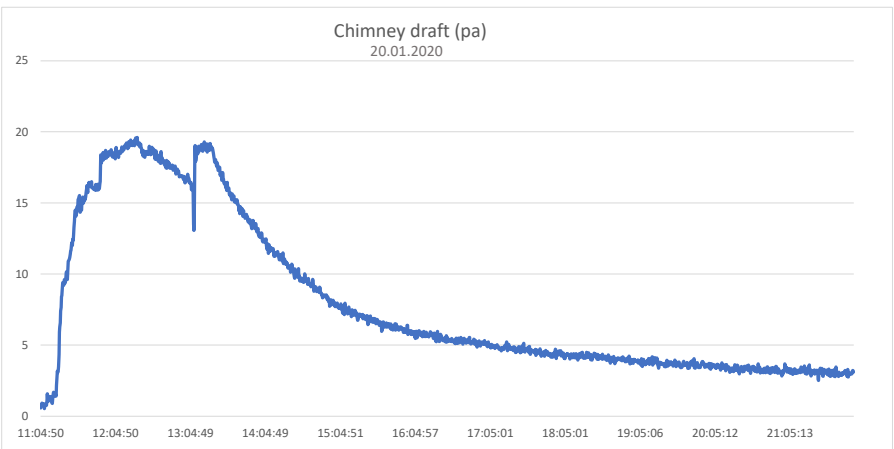
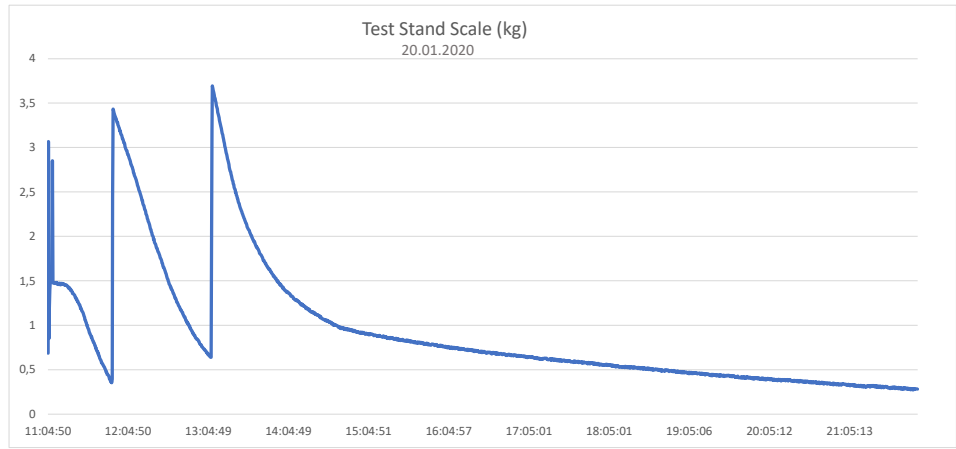
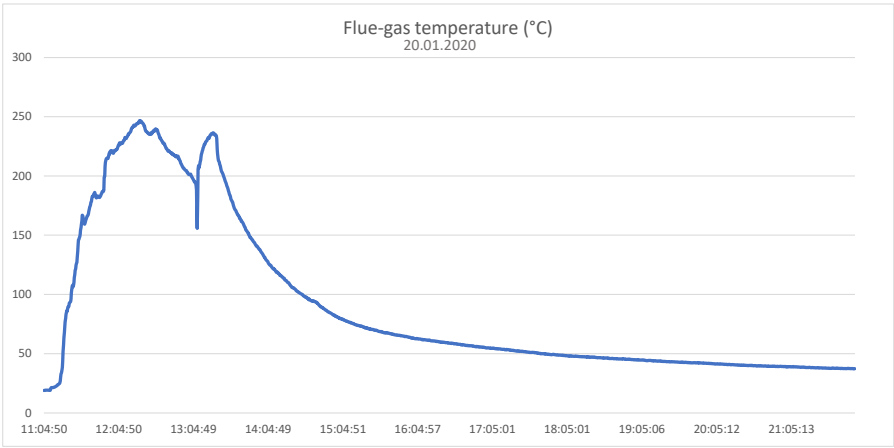
3.charge -

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,842	15,8	-
1.Charge	3,142	15,9	5
2.charge	3,074	16,1	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **21.01.2020**

Wood species: Beech

Kindling + Start-up load 09:56:33


1.charge 10:29:13

2.charge 11:45:34

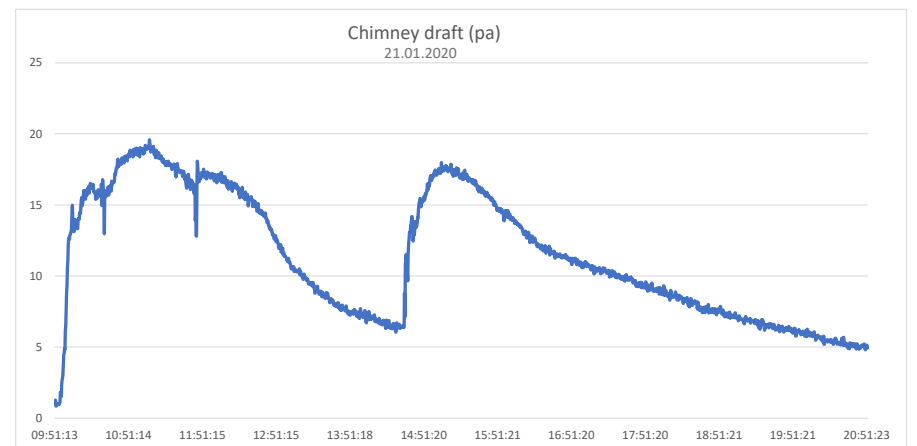
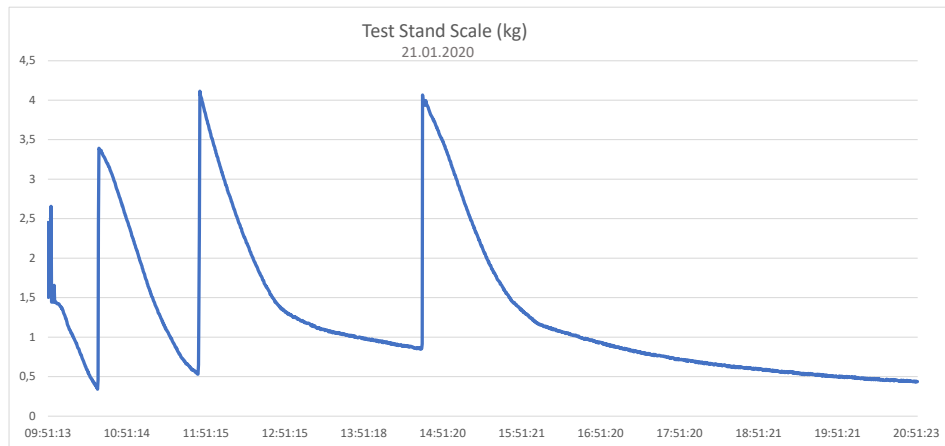
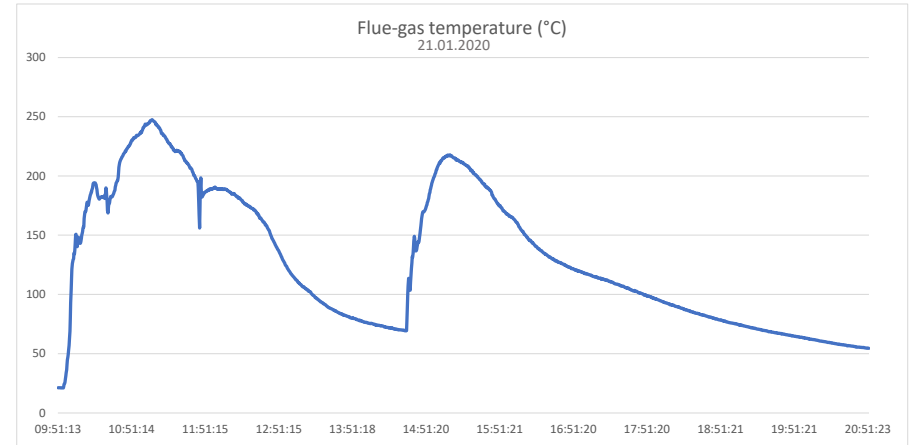
3.charge 14:36:21

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,816	18,4	-
1.Charge	3,092	18,3	5
2.charge	3,580	18,3	5
3.Charge	3,146	18,8	2
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **22.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:08:07


1.charge 10:46:27

2.charge 12:02:50

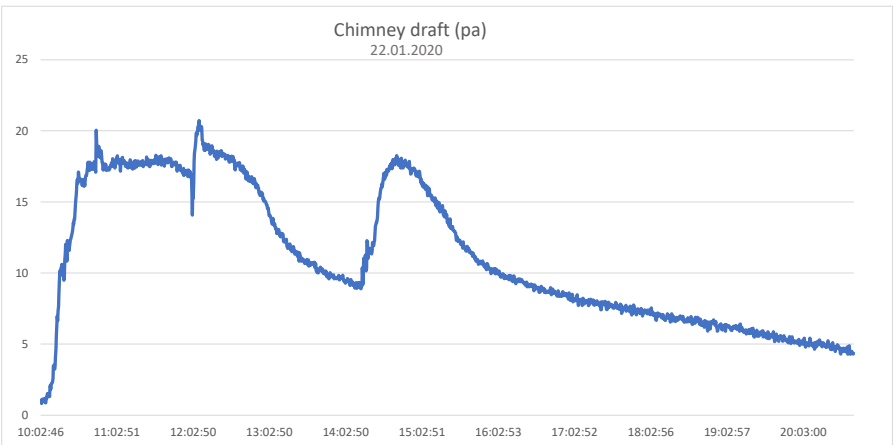
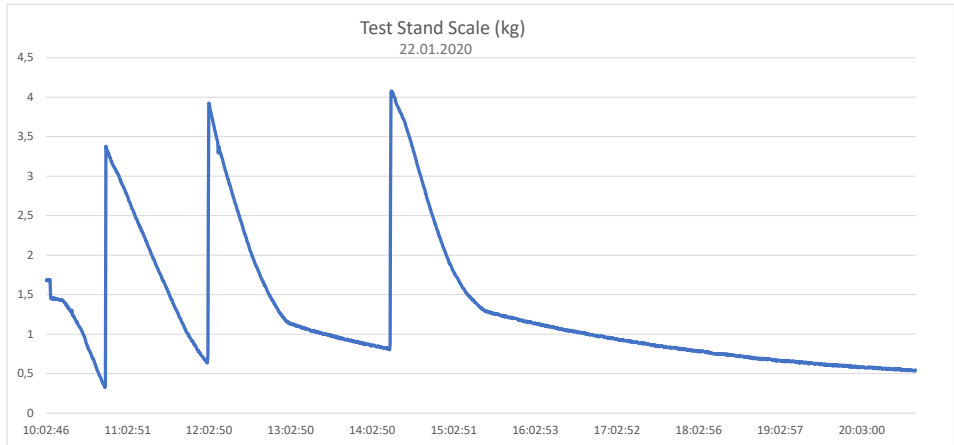
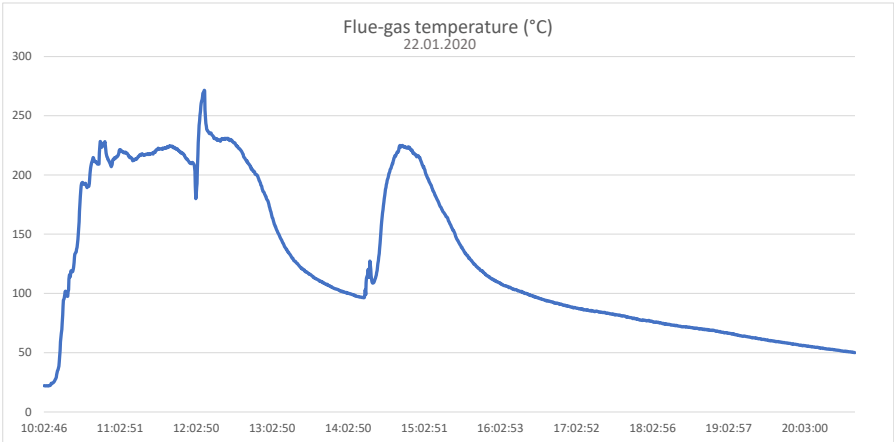
3.charge 14:16:50

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,821	17,8	-
1.Charge	3,092	15,3	5
2.charge	3,296	17,7	5
3.Charge	3,284	18,3	4
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **23.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 09:56:05


1.charge 10:24:25

2.charge 11:34:45

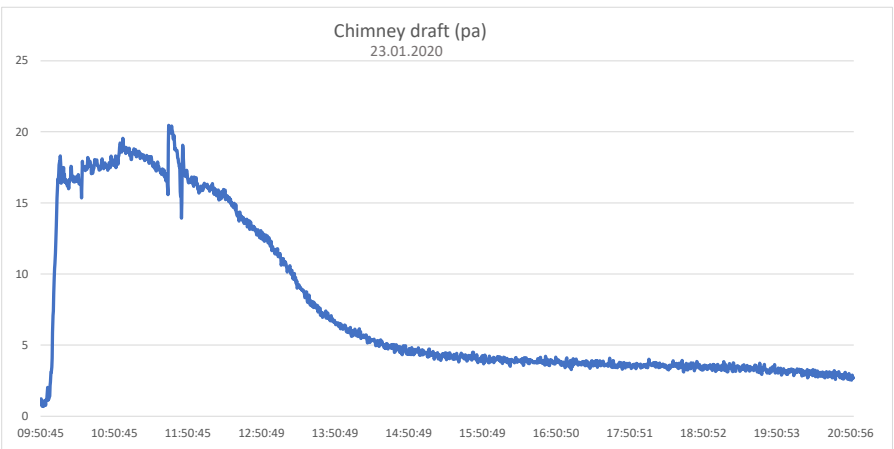
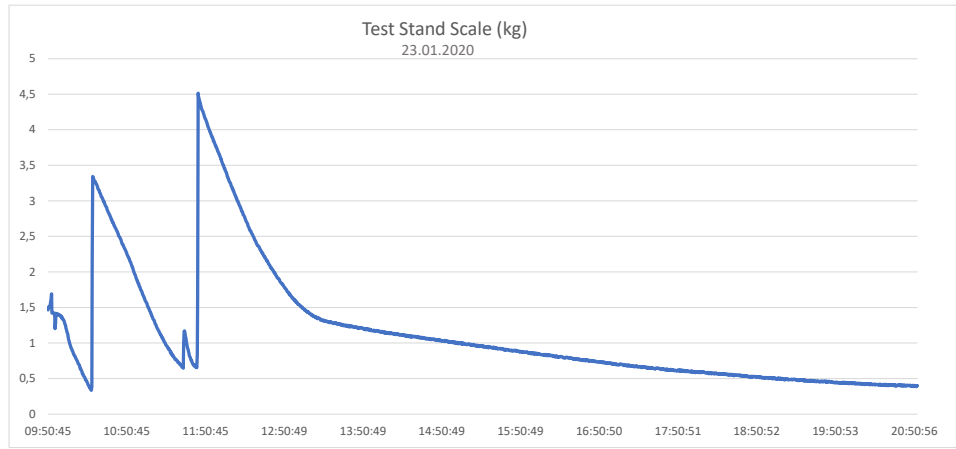
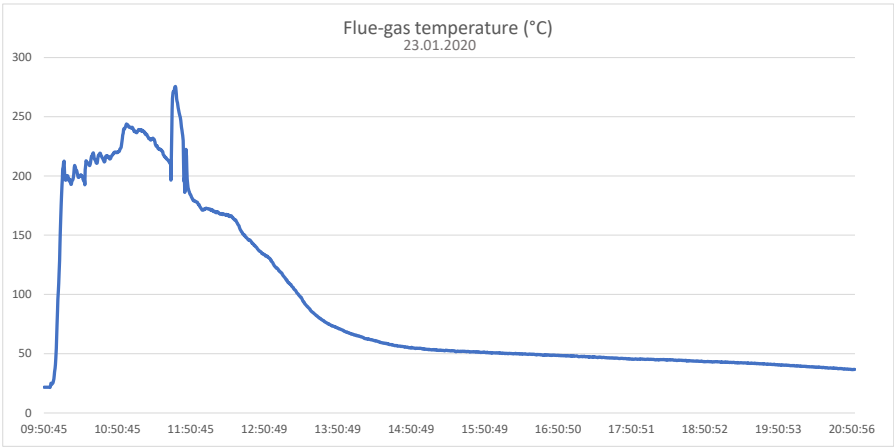
3.charge 11:44:25

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,784	15,6	-
1.Charge	3,055	15	5
2.charge	0,562	15,8	6
3.Charge	3,826	15,4	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **24.01.2020**

Kindling + Start-up load Time (hh:mm:ss) 11:22:05

1.charge 11:52:44

2.charge -

3.charge -

4.charge -

5.charge -

Weight (kg) moisture (wet basis %) No. of pieces

Kindling 0,580 ~10 -

Start-up 0,810 17,7 -

1.Charge 3,100 18,5 4


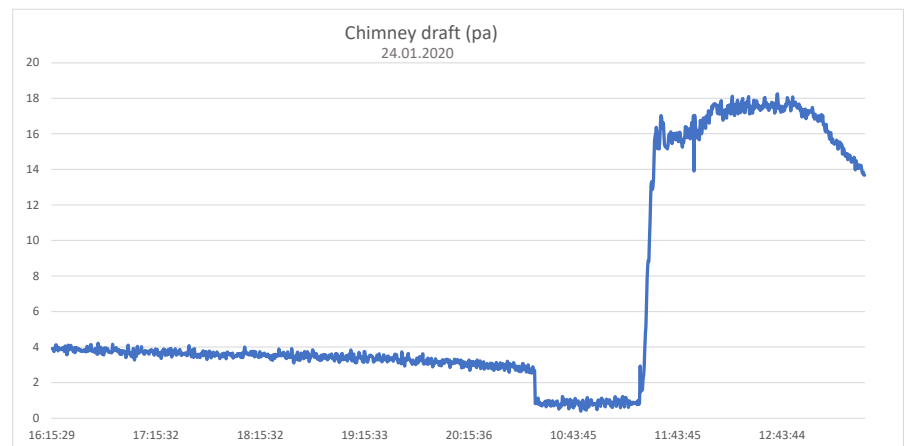
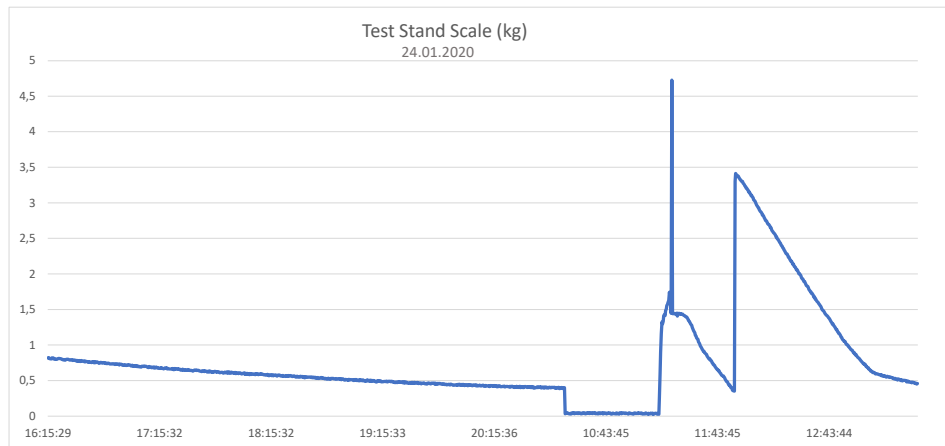
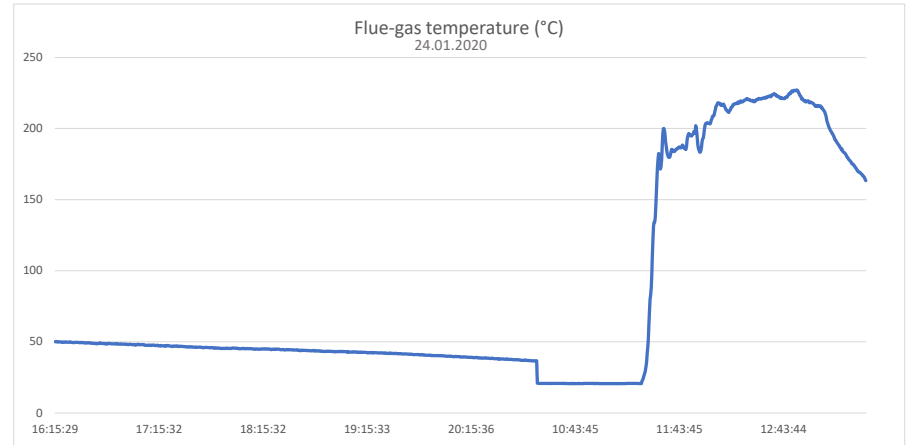
2 charge - - -

3.Charge - - -

4 charge - - -

5.Charge - - -

Wood species: Beech

Select Test Session Date: 27.01.2020

Wood species: Beech

Kindling + Start-up load 10:34:24


1.charge 11:17:46

2.charge 12:31:49

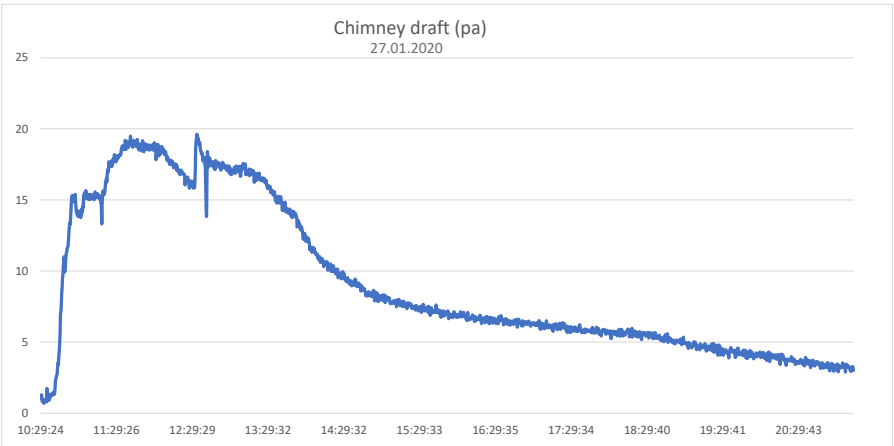
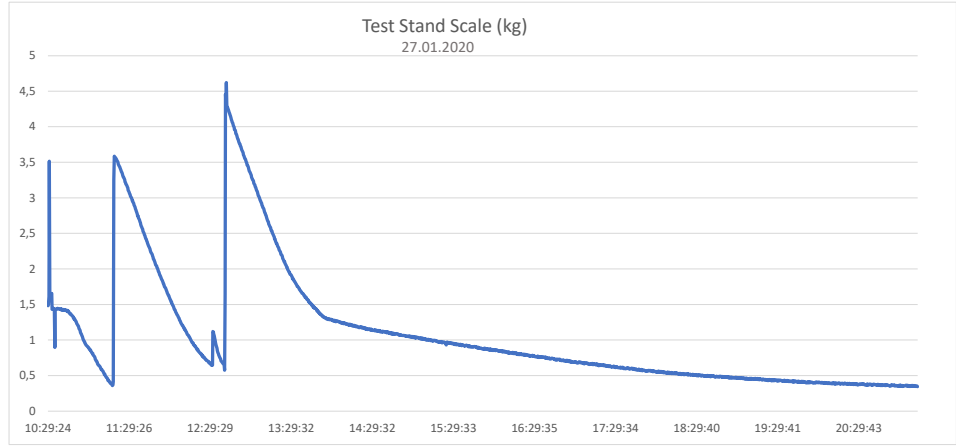
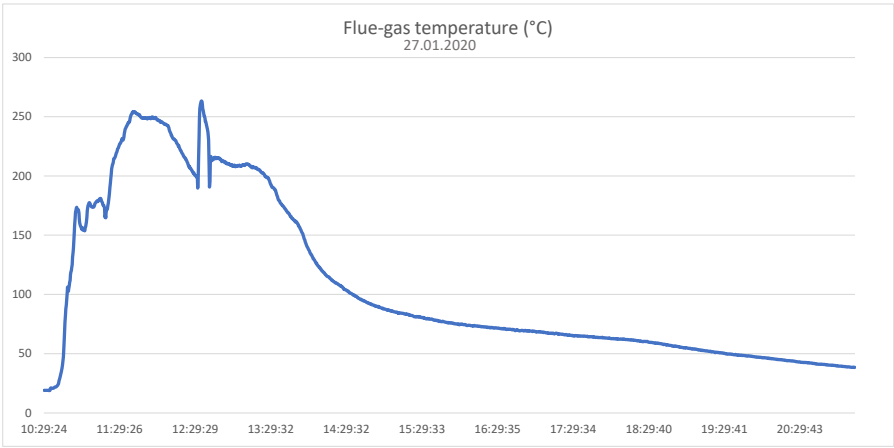
3.charge 12:40:08

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,808	18,3	-
1.Charge	3,256	18,8	5
2.charge	0,490	19	7
3.Charge	3,706	19	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **28.01.2020**

Wood species: Beech

Kindling + Start-up load: 10:28:54

1.charge: 11:01:13

2.charge: 12:15:58

3.charge: 12:24:38


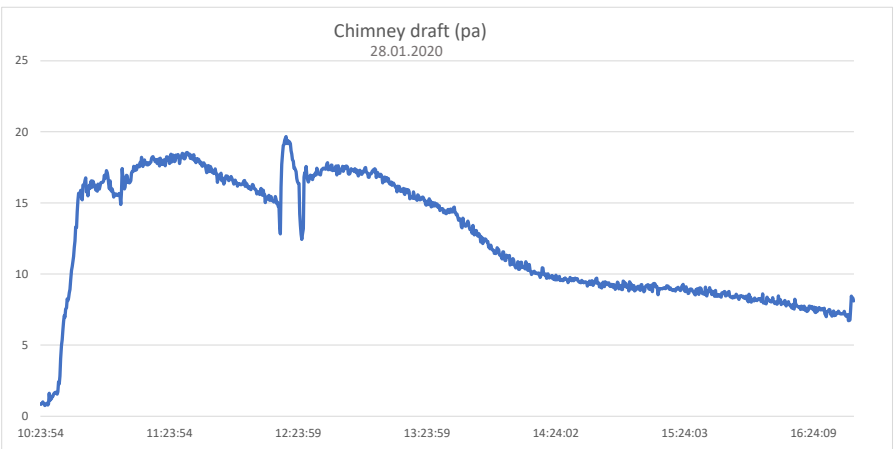
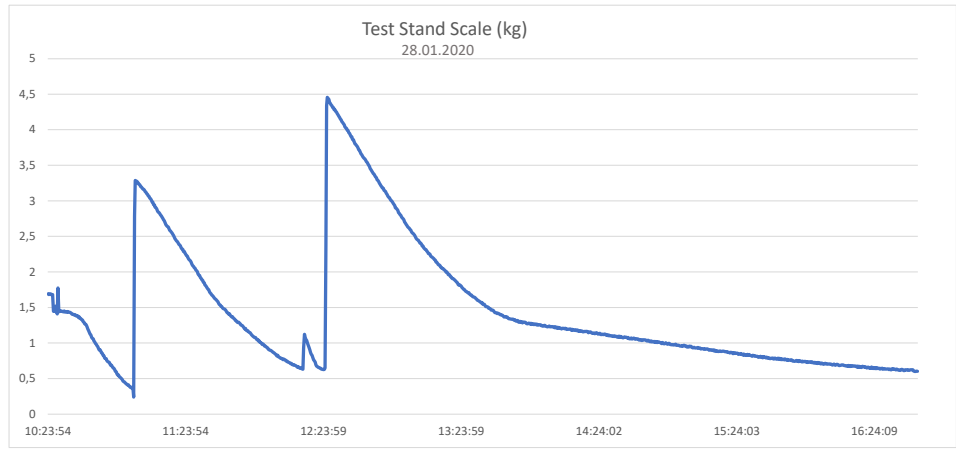
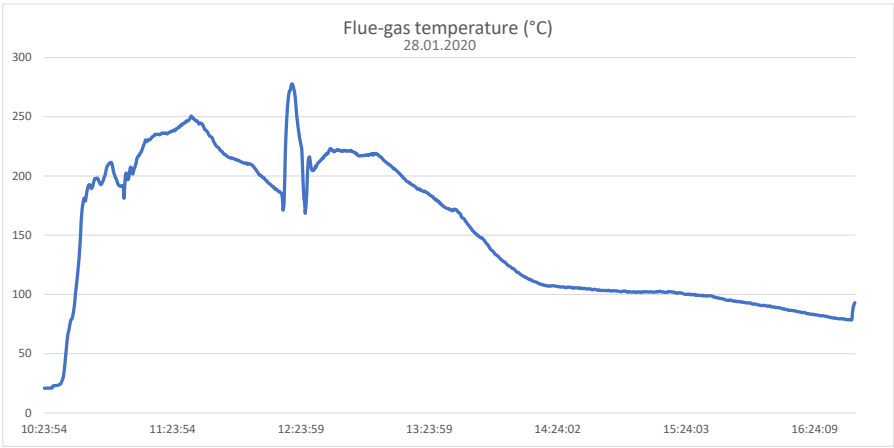
4.charge: -

5.charge: -

Time (hh:mm:ss)

weight (kg) moisture (wet basis %) No. of pieces

Kindling	0,600	~10	-
Start-up	0,800	19,5	-
1.Charge	2,986	19,8	5
2.charge	0,484	20	6
3.Charge	3,830	20,2	5
4.charge	-	-	-
5.Charge	-	-	-

Select Test Session Date: **29.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 10:49:34


1.charge 11:24:35

2.charge 12:59:54

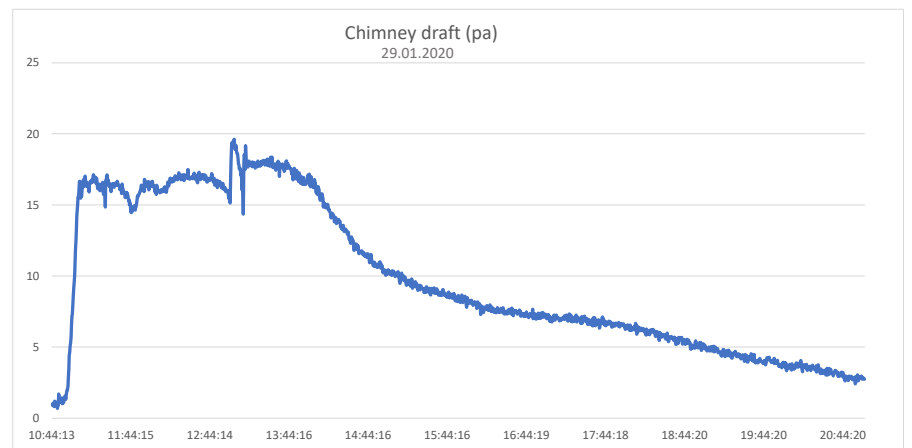
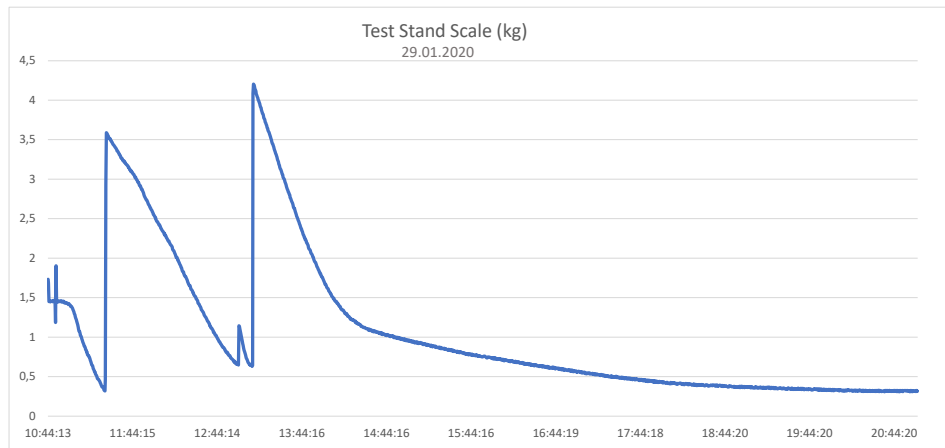
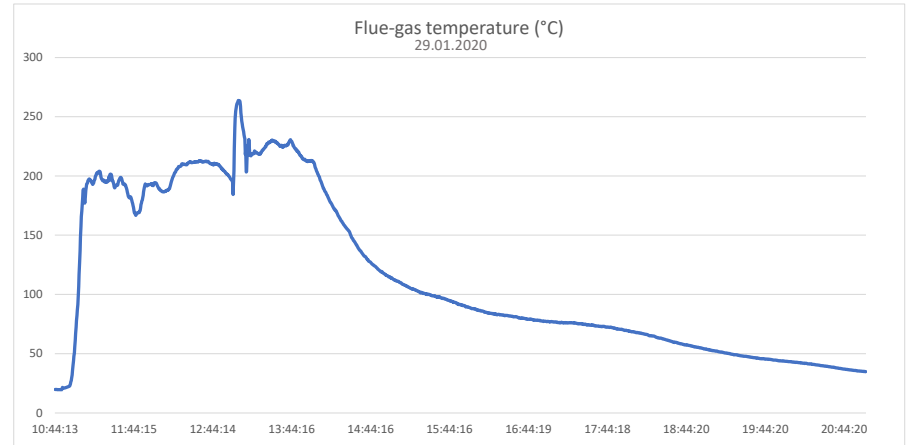
3.charge 13:09:15

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,590	~10	-
Start-up	0,814	18,9	-
1.Charge	3,324	18,9	4
2.charge	0,515	18,1	5
3.Charge	3,610	15,8	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **30.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 11:00:28


1.charge 11:49:08

2.charge 13:35:08

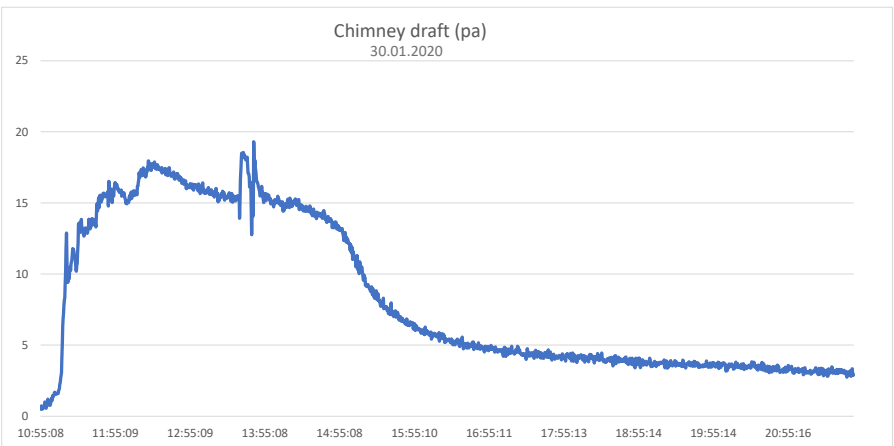
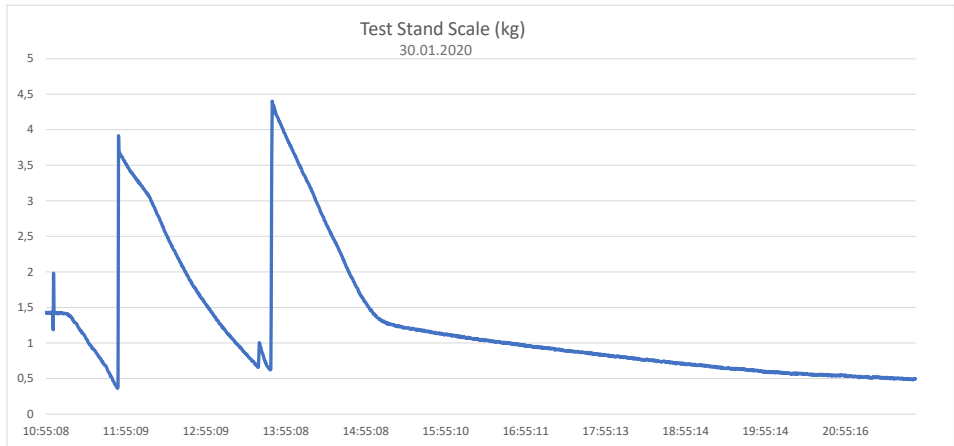
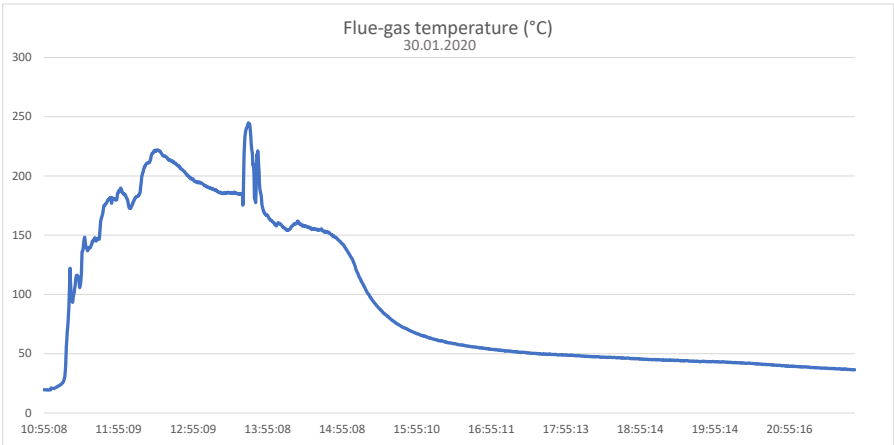
3.charge 13:44:08

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,599	~10	-
Start-up	0,775	16,9	-
1.Charge	3,354	16,9	4
2.charge	0,360	20,2	4
3.Charge	3,785	19,7	5
4.charge	-	-	-
5.Charge	-	-	-



Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
 Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
 Values to be input manually

Imperial units 1

Appendix 7
 HF2 6. February

For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10,000	lb/ft ³		
Usable Firebox Volume	0,69246	ft ³		
Total Nom. Load Wt. Target	6,925	lb		
Total Load Wt. Allowable Range	6,600 to 7,300	lb		
Core Target Wt. Allowable Range	3,100 to 4,500	lb		
Remainder Load Wt. Allowable Range	2,400 to 3,800	lb		
			Mid-Point	
Core Load Pc. Wt. Allowable Range	1,000 to 1,700	lb		1,350
Remainder Load Pc. Wt. Allowable Range	0,700 to 3,800	lb		2,250
	Pc. #			
Core Load Piece Wt. Actual	1 1,457	lb	In Range	
	2 1,310	lb	In Range	
	3 1,292	lb	In Range	
Core Load Total. Wt. Actual	4,06	lb	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 1,969	lb	In Range	
(1 to 3 Pcs.)	2 0,930	lb	In Range	
	3	lb	NA	
Remainder Load Tot. Wt. Act	2,899	lb	In Range	
Total Load Wt. Actual	6,958	lb	In Range	
Core % of Total Wt.	58%		In Range	45-65%
Remainder % of Total Wt.	42%		In Range	35-55%
Actual Load % of Nominal Target	100%		In Range	95-105%
Actual Fuel Load Density	10,0	lb/ft ³		
<u>Kindling and Start-up Fuel</u>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)	1,392	lb		
Actual Kindling Wt.	1,279	lb	In Range	18,4%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	2,087	lb		
Actual Start-up Fuel Wt.	1,790	lb	In Range	25,7%
Allowable Residual Start-up Fuel Wt. Range	0,696 to 1,392	lb		Mid-Point
Actual Residual Start-up Fuel Wt.	0,772	lb	In Range	1,044
Total Wt. All Fuel Added (wet basis)	10,03	lb		
<u>High Fire Test Run End Point Range</u>				
Based on Fuel Load Wt. (w/tares)	Low 0,626 to High 0,765	lb		Mid-Point 0,696
Actual Fuel Load Ending Wt.	0,661	lb	In Range	

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
18,2	22,8	20,8	20,6	In Range	1,208 lb	0,548 kg
18,2	21	18,8	19,3	In Range	1,097 lb	0,498 kg
19,8	22,8	18,4	20,3	In Range	1,074 lb	0,487 kg
19	22	20,2	20,4	In Range	1,635 lb	0,742 kg
19,2	21,6	19,5	20,1	In Range	0,775 lb	0,351 kg
			NA	NA	NA lb	NA kg
			20,2	In Range		
Total Load Ave. MC % (wet basis)				16,8		
Total Test Load Weight (dry basis)					5,789 lb	2,626 kg
<u>Kindling Moisture (%-dry basis)</u>						
10	10	10	10,0	In Range	1,162 lb	0,527 kg
<u>Start-up Fuel Moisture Readings (%-dry basis)</u>						
20,8	19,8	20,2	20,3	In Range	1,488 lb	0,675 kg
Total Wt. All Fuel Added (dry basis)					8,440 lb	3,83 kg
Total Wt. All Fuel Burned (dry basis)					7,007 lb	3,178 kg

Select Test Session Date: **15.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:14:06


1.charge 10:56:25

2.charge 12:24:48

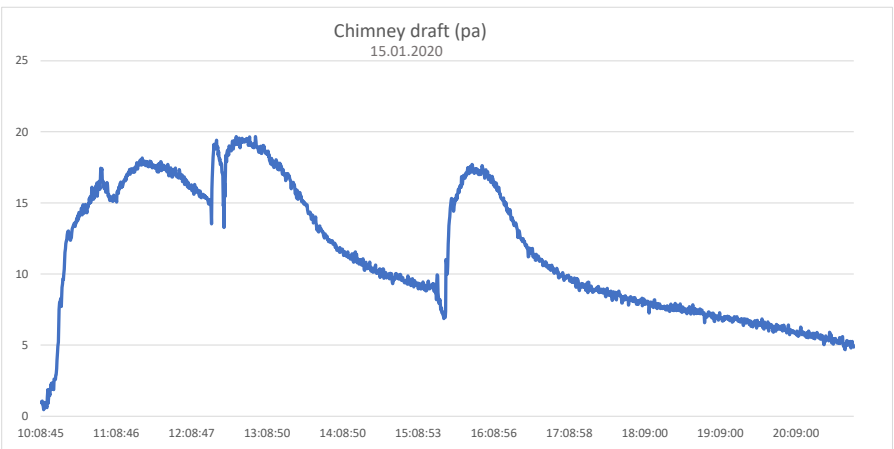
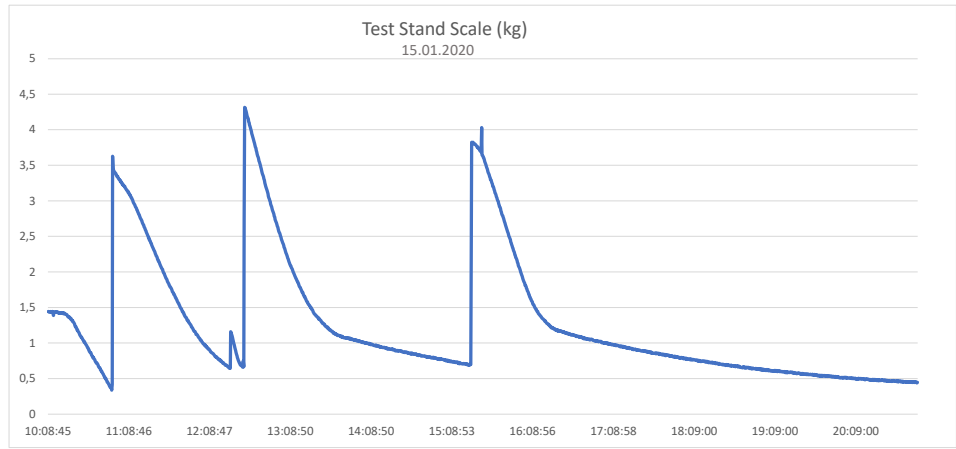
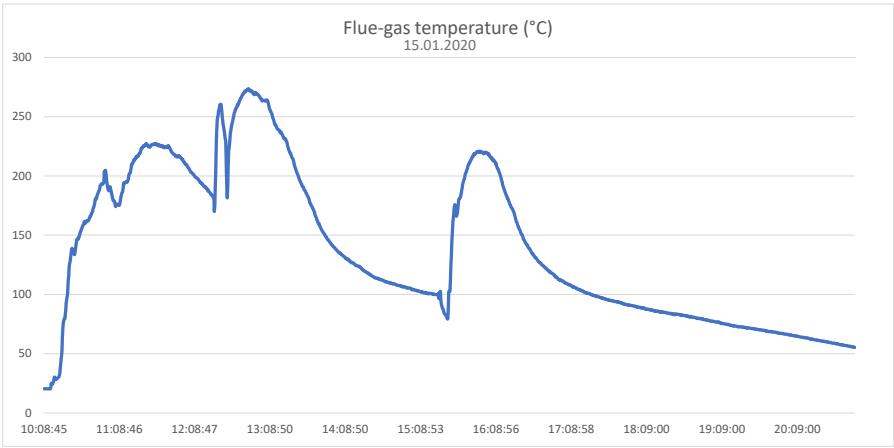
3.charge 12:33:47

4.charge 15:23:17

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,810	16,9	-
1.Charge	3,166	19,8	5
2.charge	0,524	15,8	7
3.Charge	3,680	16,2	5
4.charge	3,136	-	6
5.Charge	-	-	-



Select Test Session Date: **16.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 08:25:44


1.charge 08:59:44

2.charge 10:05:26

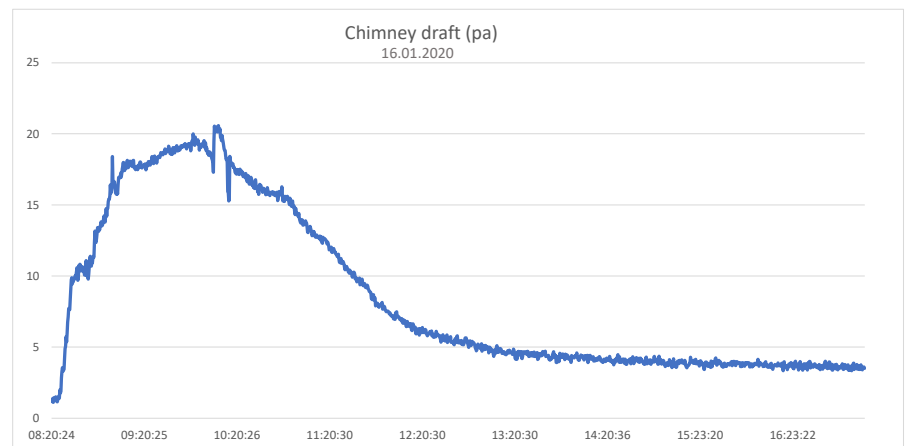
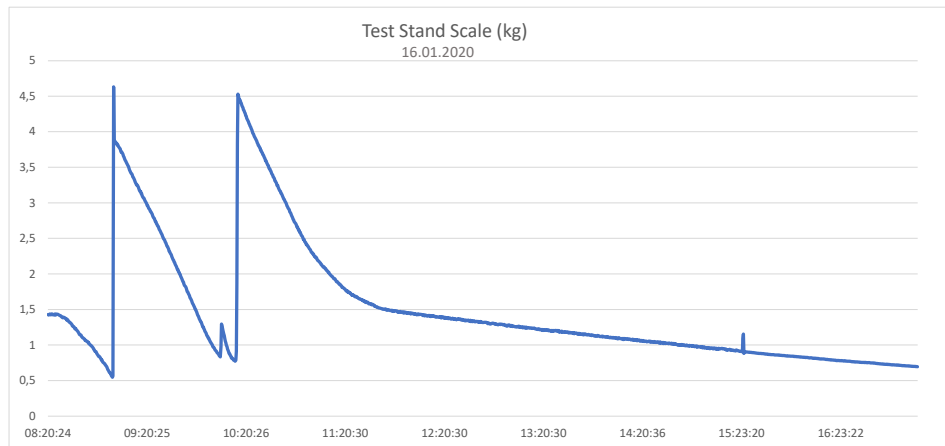
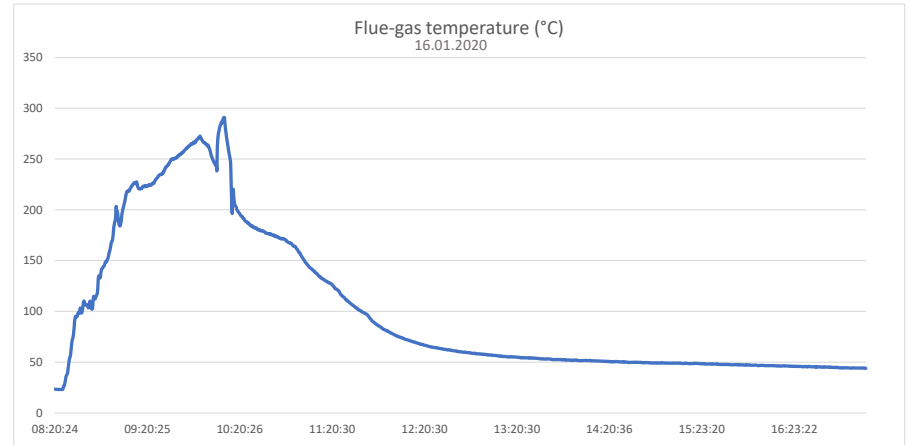
3.charge 10:14:27

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,579	~10	-
Start-up	0,800	17,1	-
1.Charge	3,429	17,8	5
2.charge	0,480	17,9	8
3.Charge	3,780	16,9	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **17.01.2020**

Wood species: Beech

Kindling + Start-up load: 10:44:04

1.charge: 11:12:44


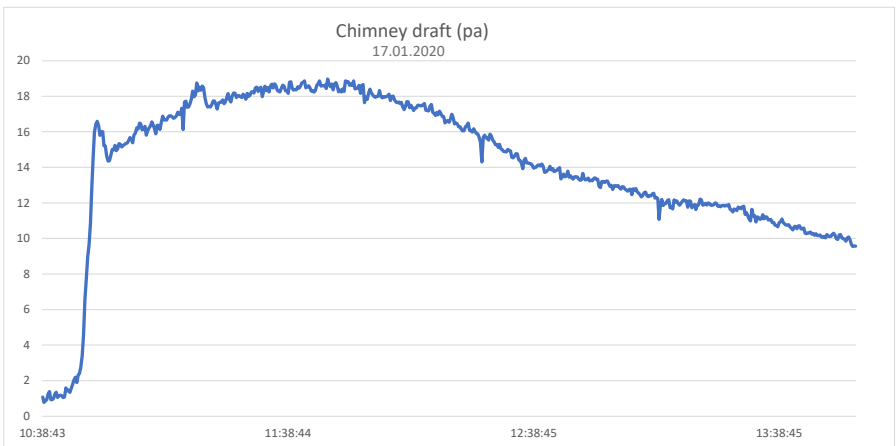
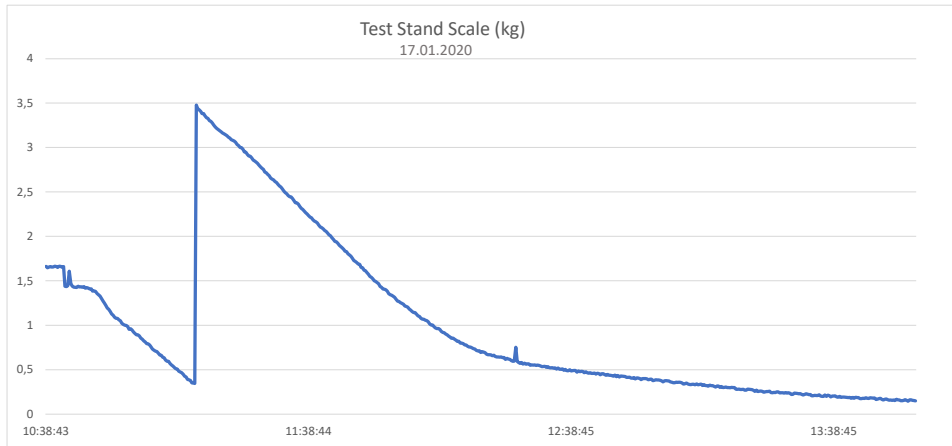
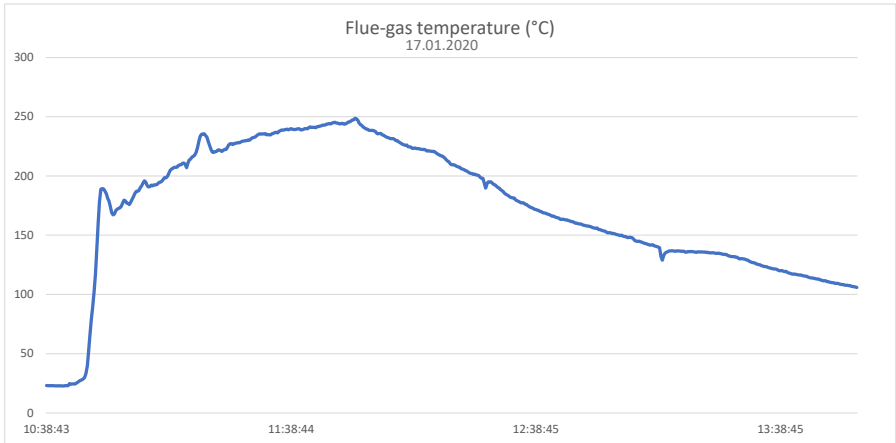
2.charge: -

3.charge: -

4.charge: -

5.charge: -

	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,579	≈10	-
Start-up	0,806	16,9	-
1.Charge	3,147	16,9	5
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-





Select Test Session Date: **20.01.2020**

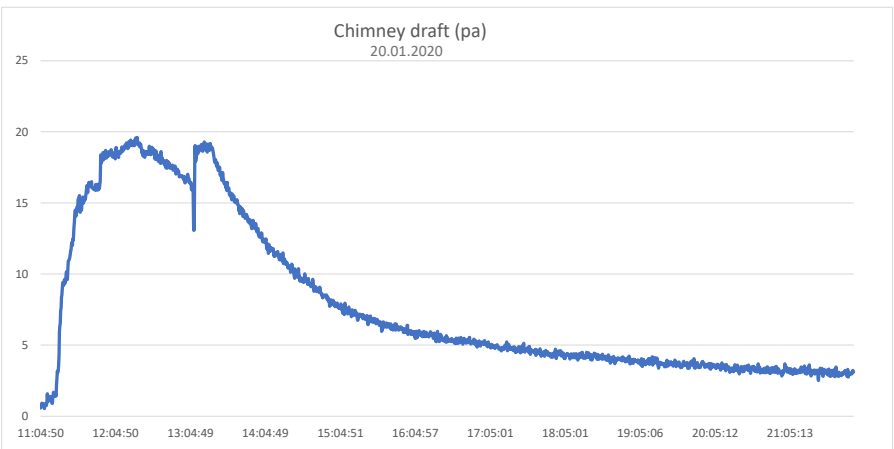
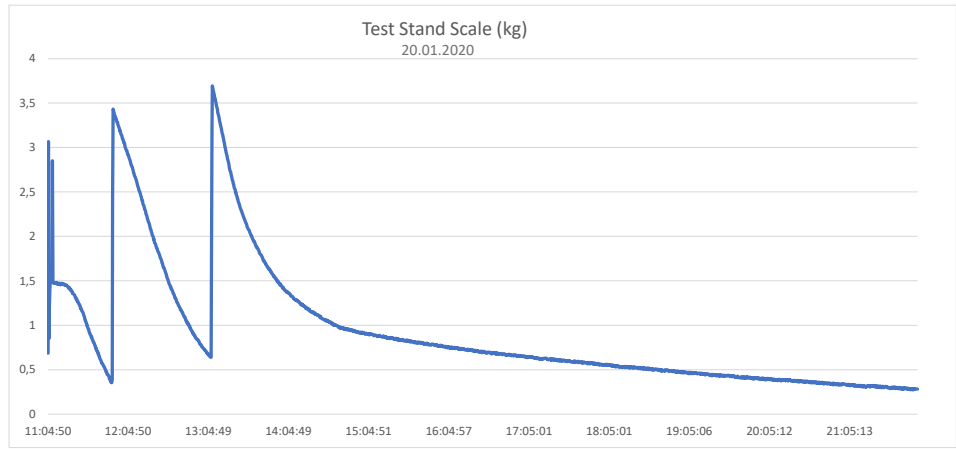
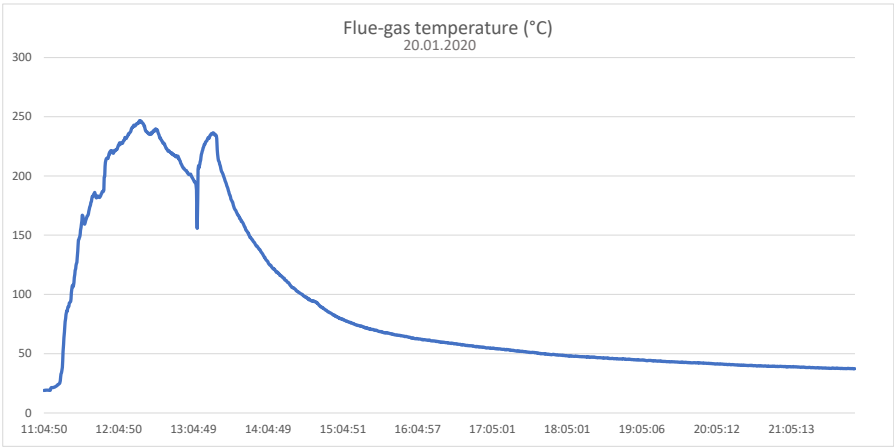
Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load	11:10:09
1.charge	11:52:49
2.charge	13:07:09
3.charge	-
4.charge	-
5.charge	-



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,842	15,8	-
1.Charge	3,142	15,9	5
2.charge	3,074	16,1	5
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **21.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 09:56:33


1.charge 10:29:13

2.charge 11:45:34

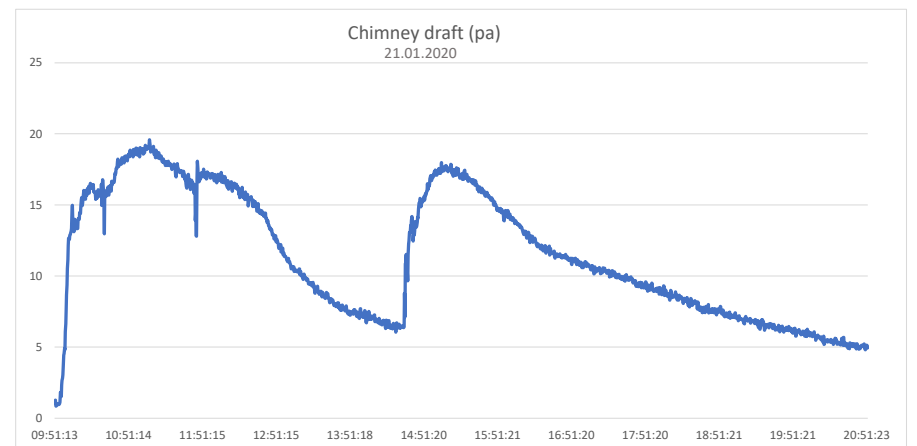
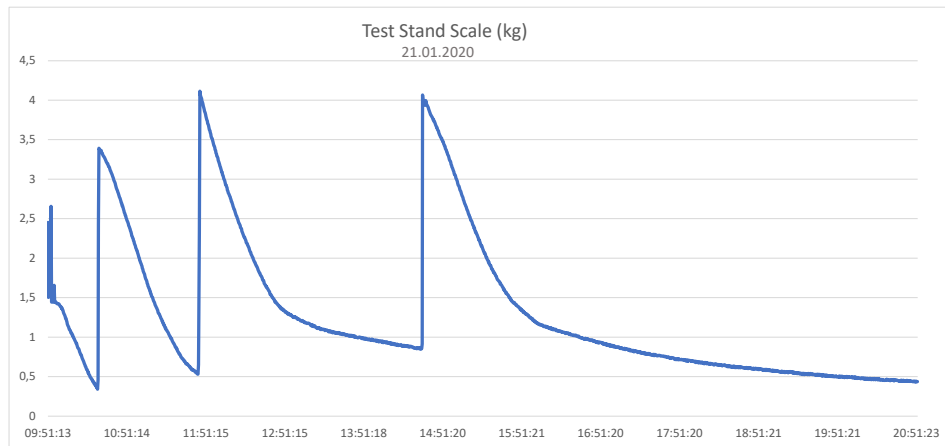
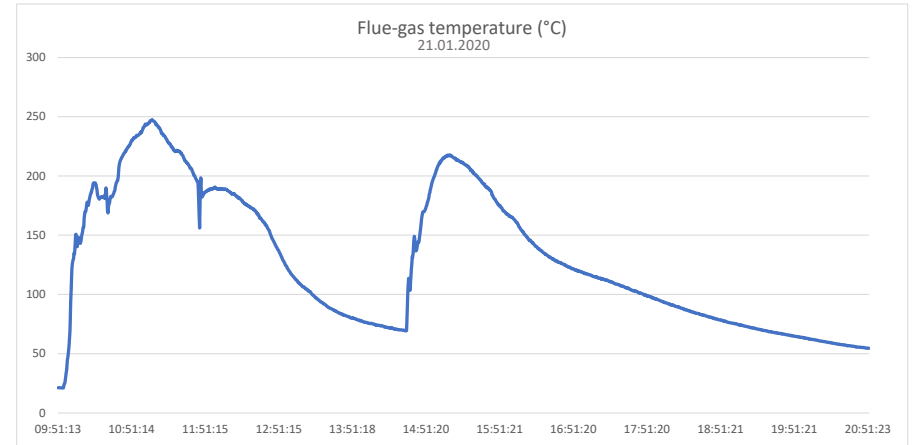
3.charge 14:36:21

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,816	18,4	-
1.Charge	3,092	18,3	5
2.charge	3,580	18,3	5
3.Charge	3,146	18,8	2
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **22.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 10:08:07


1.charge 10:46:27

2.charge 12:02:50

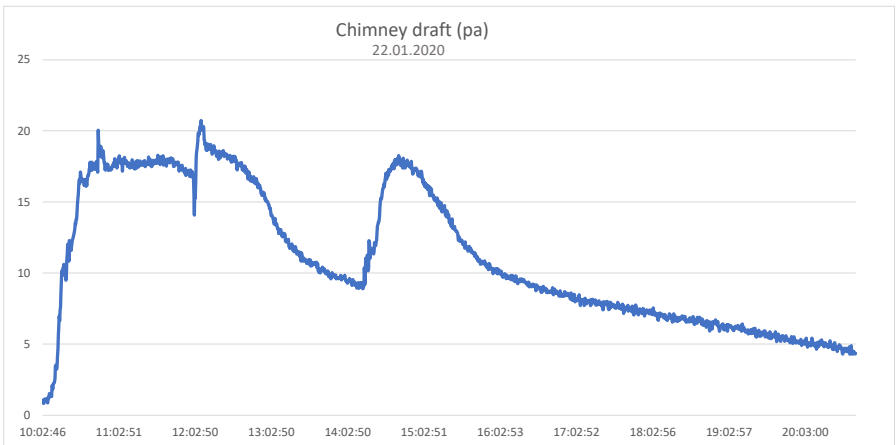
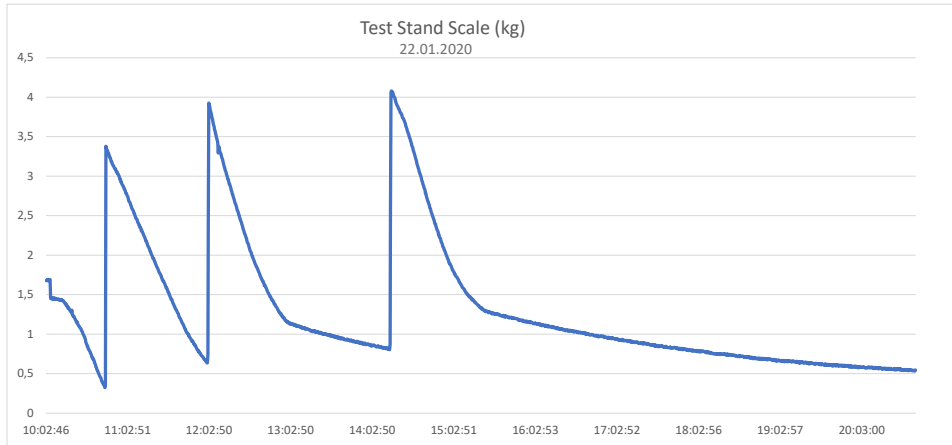
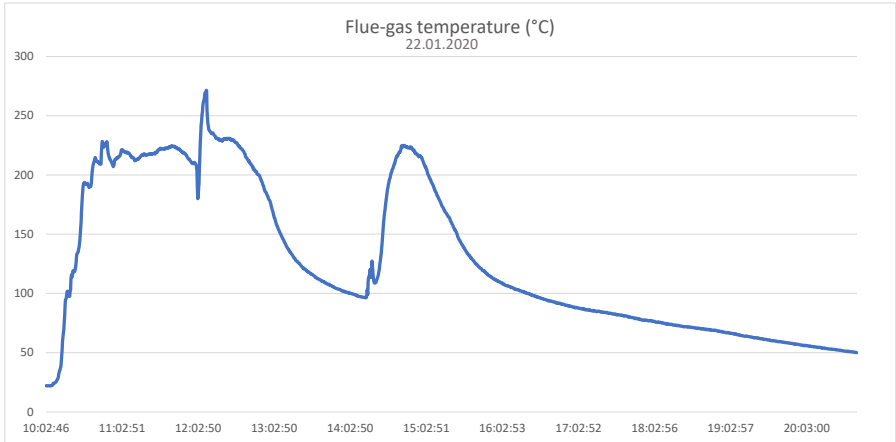
3.charge 14:16:50

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,821	17,8	-
1.Charge	3,092	15,3	5
2.charge	3,296	17,7	5
3.Charge	3,284	18,3	4
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **23.01.2020**

Wood species: Beech

Time (hh:mm:ss)

Kindling + Start-up load 09:56:05


1.charge 10:24:25

2.charge 11:34:45

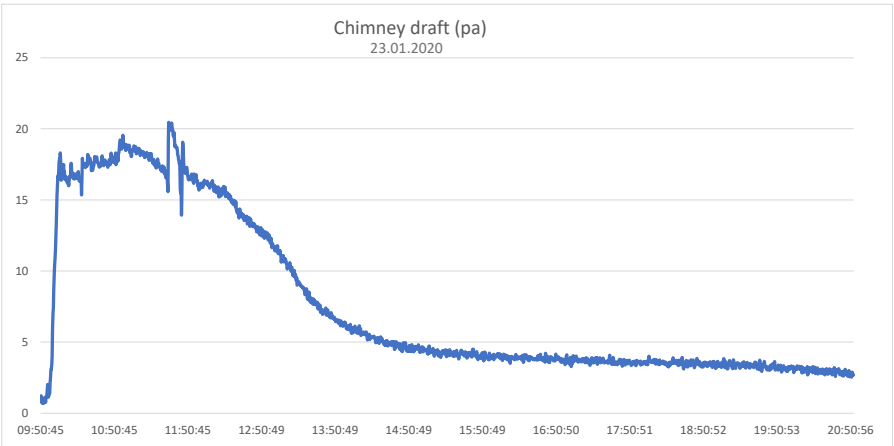
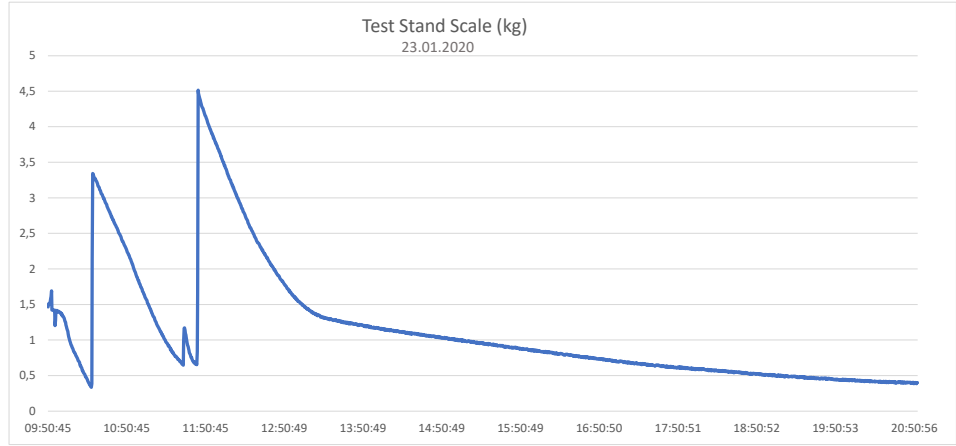
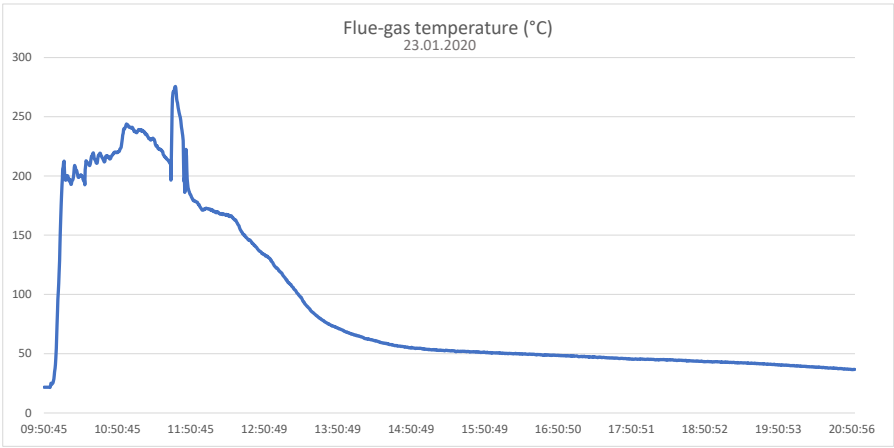
3.charge 11:44:25

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,784	15,6	-
1.Charge	3,055	15	5
2.charge	0,562	15,8	6
3.Charge	3,826	15,4	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **24.01.2020**

Kindling + Start-up load Time (hh:mm:ss) 11:22:05

1.charge 11:52:44


2.charge -

3.charge -

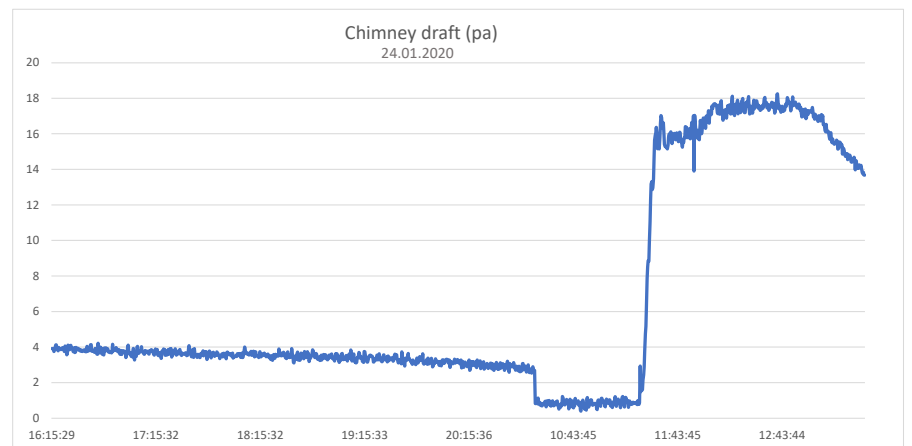
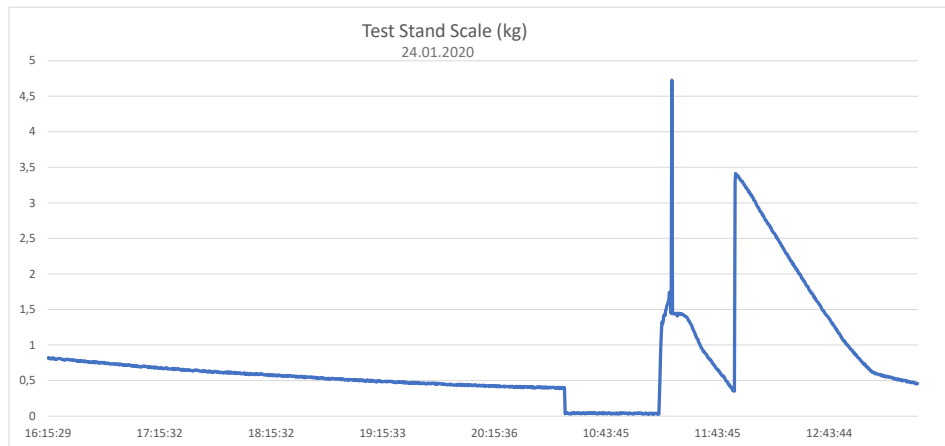
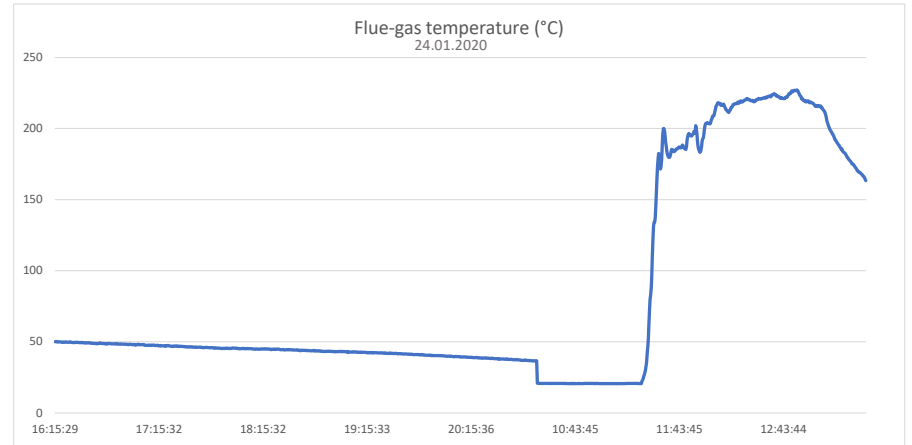
4.charge -

5.charge -

Wood species: Beech



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,810	17,7	-
1.Charge	3,100	18,5	4
2.charge	-	-	-
3.Charge	-	-	-
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: 27.01.2020

Wood species: Beech

Kindling + Start-up load 10:34:24


1.charge 11:17:46

2.charge 12:31:49

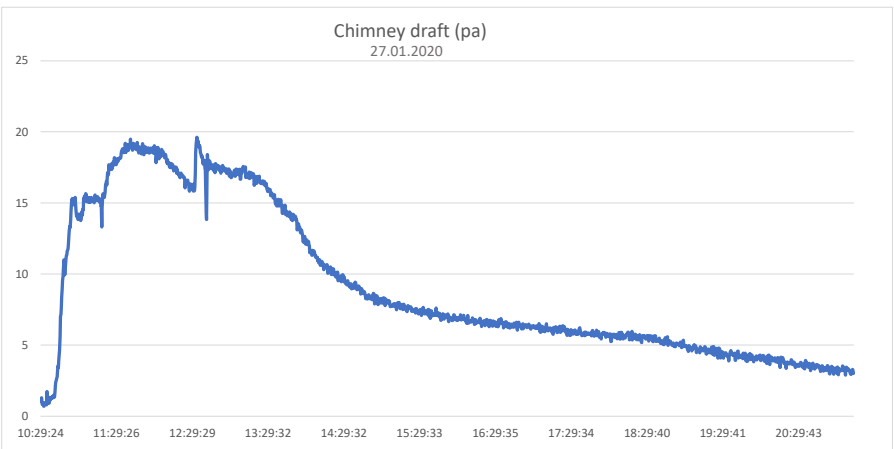
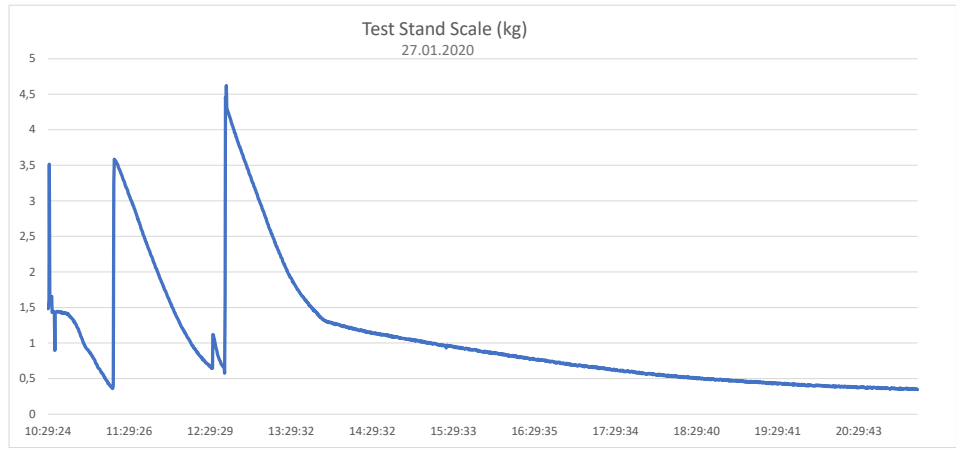
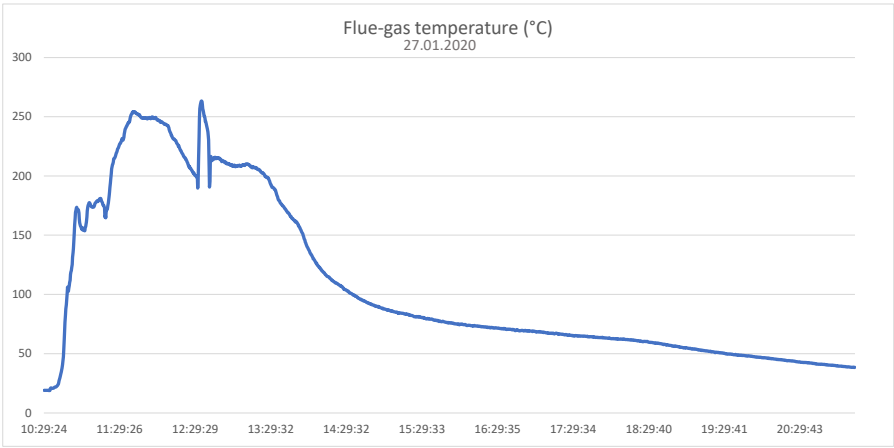
3.charge 12:40:08

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,580	~10	-
Start-up	0,808	18,3	-
1.Charge	3,256	18,8	5
2.charge	0,490	19	7
3.Charge	3,706	19	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **28.01.2020**

Wood species: Beech

Kindling + Start-up load: 10:28:54


1.charge: 11:01:13

2.charge: 12:15:58

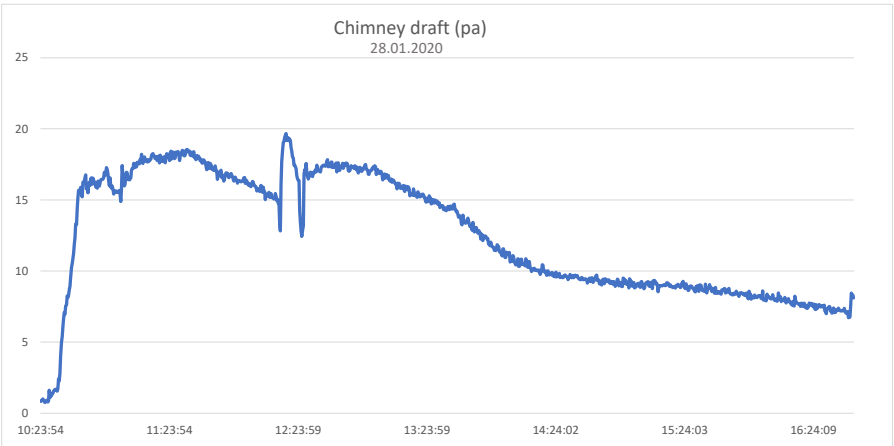
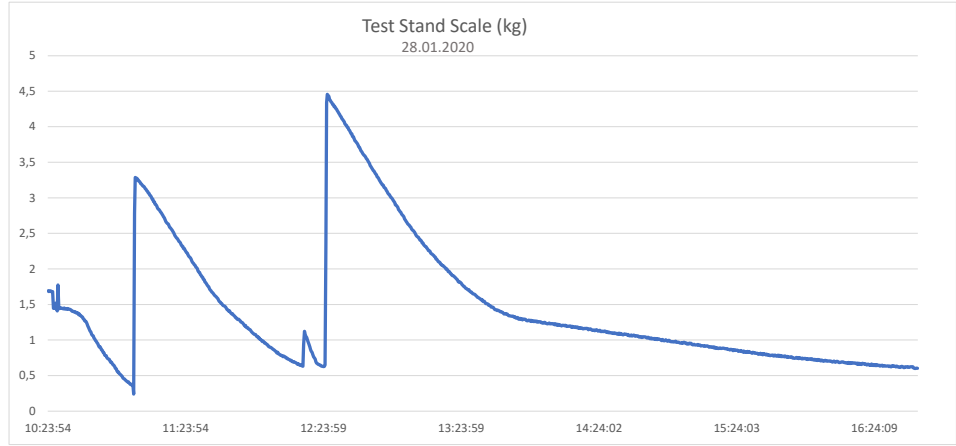
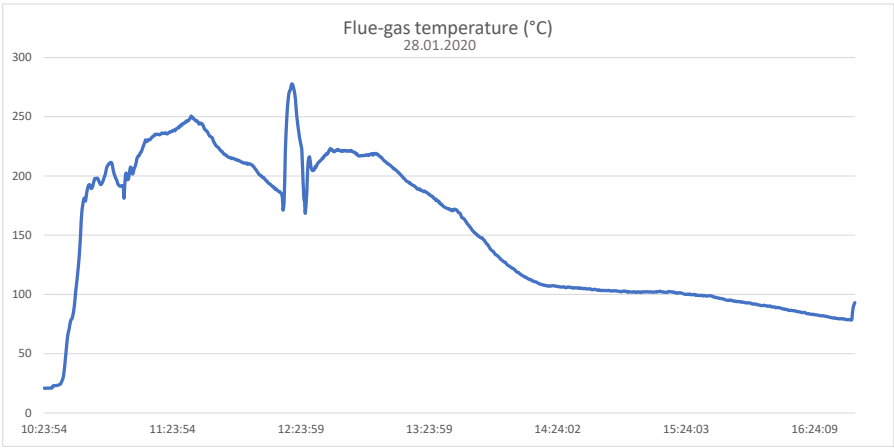
3.charge: 12:24:38

4.charge: -

5.charge: -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,600	~10	-
Start-up	0,800	19,5	-
1.Charge	2,986	19,8	5
2.charge	0,484	20	6
3.Charge	3,830	20,2	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **29.01.2020**

Time (hh:mm:ss) **10:49:34** Wood species: **Beech**

Kindling + Start-up load 10:49:34


1.charge 11:24:35

2.charge 12:59:54

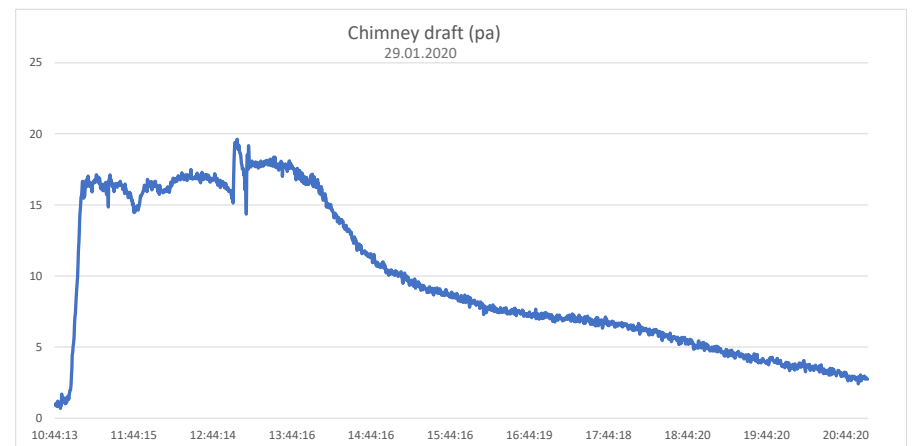
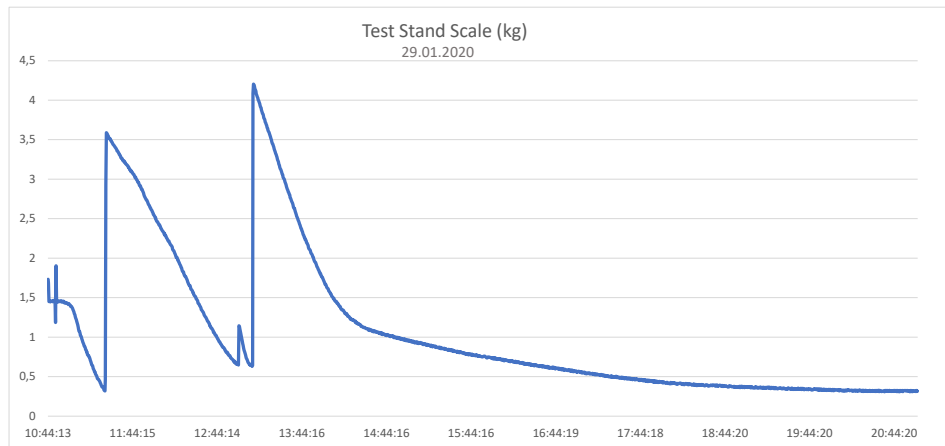
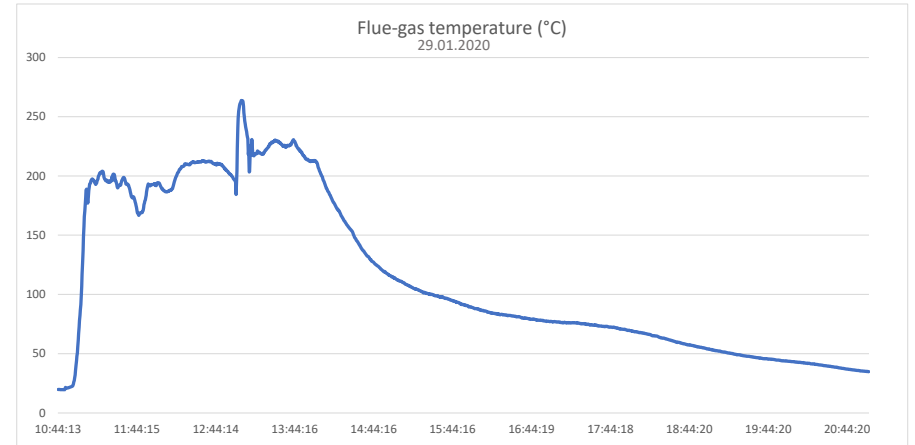
3.charge 13:09:15

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,590	~10	-
Start-up	0,814	18,9	-
1.Charge	3,324	18,9	4
2.charge	0,515	18,1	5
3.Charge	3,610	15,8	5
4.charge	-	-	-
5.Charge	-	-	-



Select Test Session Date: **30.01.2020**

Time (hh:mm:ss) **Wood species: Beech**

Kindling + Start-up load 11:00:28


1.charge 11:49:08

2.charge 13:35:08

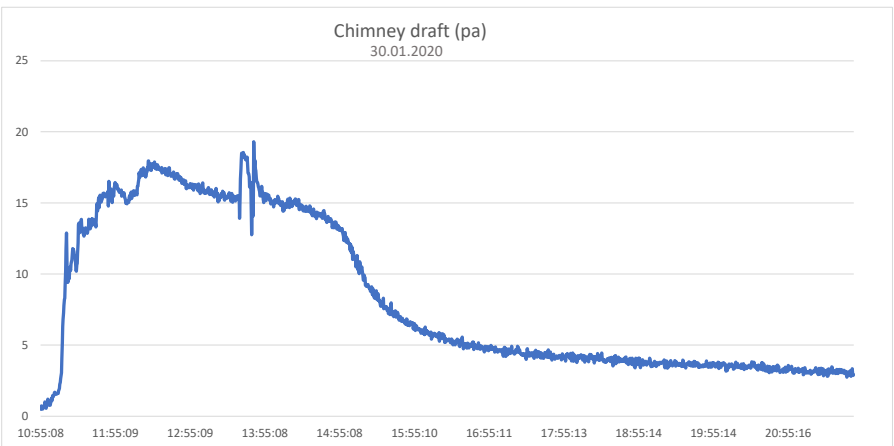
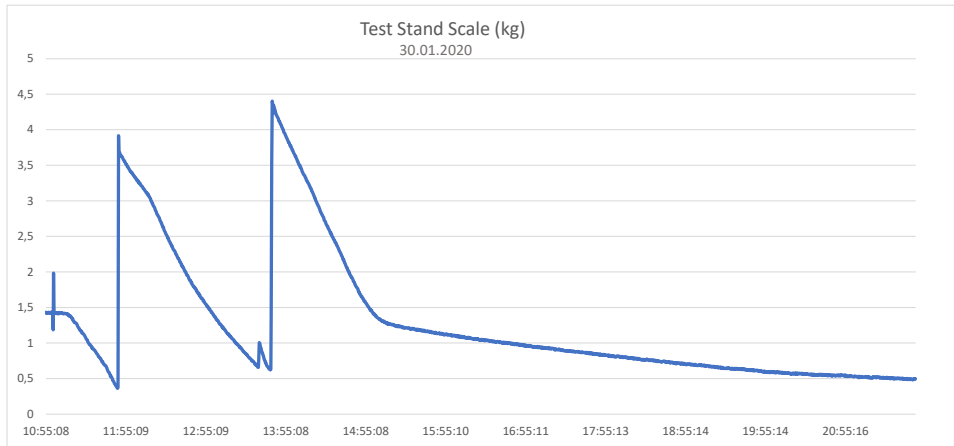
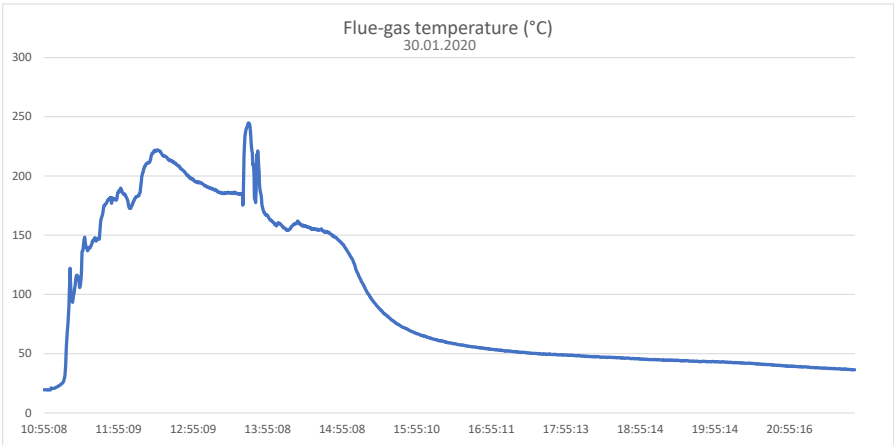
3.charge 13:44:08

4.charge -

5.charge -



	weight (kg)	moisture (wet basis %)	No. of pieces
Kindling	0,599	~10	-
Start-up	0,775	16,9	-
1.Charge	3,354	16,9	4
2.charge	0,360	20,2	4
3.Charge	3,785	19,7	5
4.charge	-	-	-
5.Charge	-	-	-



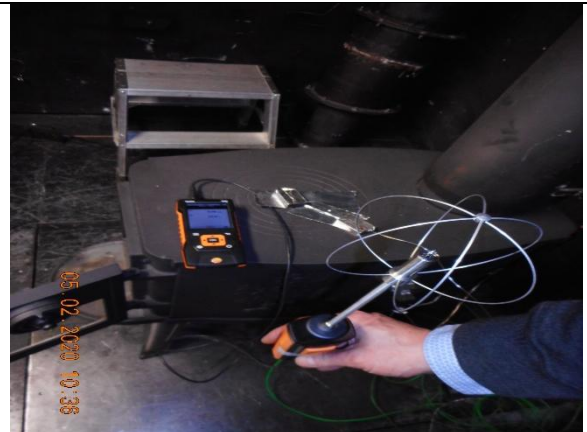
Annex 3

Title: Sequence of images, course of testing the 5th February 2020

Pages total: 3, excl this cover page



1) Leakage check of pitot tube



2) Measurement of air velocity prior to test



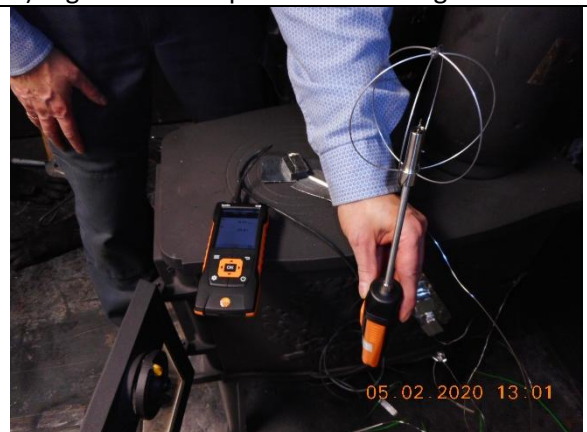
3) High fire fuel load of 5 logs of beech wood



4) High fire start-up fuel and kindling



5) Check of High fire load fuel moisture (wb)



6) Measurement of air velocity prior to test



7) Morsø 2B with surface temp TC on test rig

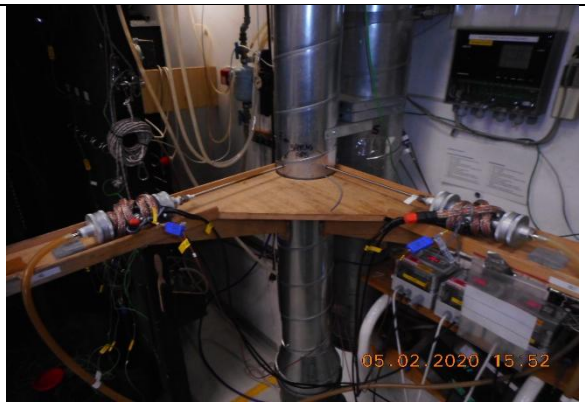


8) Arrangement of CS+HF fuel load

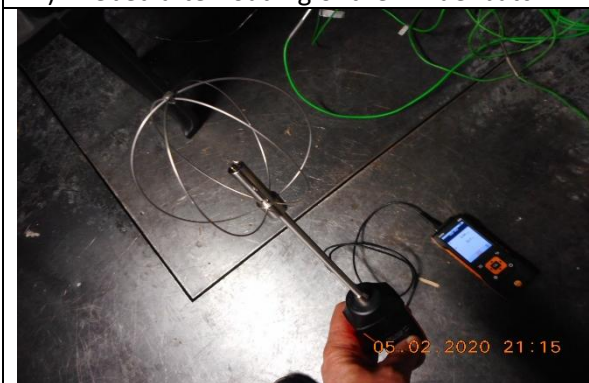




17) Firebed after loading of the LF fuel batch



18) Dual sampling arrangement



19) Measurement of air velocity, end of LF test



20) Test accomplished at basic firebed 650 g



20) Set of filters from the Low fire test, the 5th of February

Annex 4

Title: Sequence of images, course of testing the 6th February 2020

Pages total: 2, excl this cover page





9) Bed of embers at the end of the High fire test



10) Start of the Medium fire test



11) Measurement of air velocity at the beginning of the Medium fire test



12) Measurement of air velocity at the end of the Medium fire test



13) MF test accomplished at basic firebed of 650 grams.



14) Sealing of the cold stove the 7th of February

Annex 5

Title: HF1 Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
 Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
 Values to be input manually

Imperial units 1

Appendix 5
 HF1 5. February

For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10,000	lb/ft ³		
Usable Firebox Volume	0,69246	ft ³		
Total Nom. Load Wt. Target	6,925	lb		
Total Load Wt. Allowable Range	6,600 to 7,300	lb		
Core Target Wt. Allowable Range	3,100 to 4,500	lb		
Remainder Load Wt. Allowable Range	2,400 to 3,800	lb		
			Mid-Point	
Core Load Pc. Wt. Allowable Range	1,000 to 1,700	lb		1,350
Remainder Load Pc. Wt. Allowable Range	0,700 to 3,800	lb		2,250
	Pc. #			
Core Load Piece Wt. Actual	1 1,358	lb	In Range	
	2 1,338	lb	In Range	
	3 1,329	lb	In Range	
Core Load Total. Wt. Actual	4,03	lb	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 1,984	lb	In Range	
(1 to 3 Pcs.)	2 0,915	lb	In Range	
	3	lb	NA	
Remainder Load Tot. Wt. Act	2,899	lb	In Range	
Total Load Wt. Actual	6,925	lb	In Range	
Core % of Total Wt.	58%		In Range	45-65%
Remainder % of Total Wt.	42%		In Range	35-55%
Actual Load % of Nominal Target	100%		In Range	95-105%
Actual Fuel Load Density	10,0	lb/ft ³		
<u>Kindling and Start-up Fuel</u>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)	1,385	lb		
Actual Kindling Wt.	1,283	lb	In Range	18,5%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	2,077	lb		
Actual Start-up Fuel Wt.	1,795	lb	In Range	25,9%
Allowable Residual Start-up Fuel Wt. Range	0,692 to 1,385	lb		Mid-Point
Actual Residual Start-up Fuel Wt.	0,772	lb	In Range	1,039
Total Wt. All Fuel Added (wet basis)	10,00	lb		
<u>High Fire Test Run End Point Range</u>				
	Low		High	Mid-Point
Based on Fuel Load Wt. (w/tares)	0,623	to	0,762	lb
Actual Fuel Load Ending Wt.	0,661	lb	In Range	

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
19,8	19	20,9	19,9	In Range	1,133	lb 0,514 kg
18,3	20,6	19,2	19,4	In Range	1,121	lb 0,509 kg
19,2	19,6	19,6	19,5	In Range	1,113	lb 0,505 kg
19,4	20,2	19,4	19,7	In Range	1,658	lb 0,752 kg
19,6	21,1	23,9	21,5	In Range	0,753	lb 0,341 kg
			NA	NA	NA	NA kg
			19,9	In Range		
Total Load Ave. MC % (wet basis)				16,6		
Total Test Load Weight (dry basis)					5,777	lb 2,621 kg
<u>Kindling Moisture (%-dry basis)</u>						
10	10	10	10,0	In Range	1,166	lb 0,529 kg
<u>Start-up Fuel Moisture Readings (%-dry basis)</u>						
19,6	22,1	21,9	21,2	In Range	1,481	lb 0,672 kg
Total Wt. All Fuel Added (dry basis)					8,425	lb 3,82 kg
Total Wt. All Fuel Burned (dry basis)					6,991	lb 3,171 kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
 Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
 Values to be input manually

Metric units 2

Appendix 5
 HF1 5. February

For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	160,185	kg/m ³		
Usable Firebox Volume	0,01961	m ³		
Total Nom. Load Wt. Target	3,141	kg		
Total Load Wt. Allowable Range	3,000 to 3,300	kg		
Core Target Wt. Allowable Range	1,400 to 2,000	kg		
Remainder Load Wt. Allowable Range	1,100 to 1,700	kg		
			Mid-Point	
Core Load Pc. Wt. Allowable Range	0,500 to 0,800	kg	0,650	
Remainder Load Pc. Wt. Allowable Range	0,300 to 1,700	kg	1,000	
	Pc. #			
Core Load Piece Wt. Actual	1 0,616	kg	In Range	
	2 0,607	kg	In Range	
	3 0,603	kg	In Range	
Core Load Total. Wt. Actual	1,83	kg	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 0,900	kg	In Range	
(1 to 3 Pcs.)	2 0,415	kg	In Range	
	3	kg	NA	
Remainder Load Tot. Wt. Act	1,315	kg	In Range	
Total Load Wt. Actual	3,141	kg	In Range	
Core % of Total Wt.	58%		In Range	45-65%
Remainder % of Total Wt.	42%		In Range	35-55%
Actual Load % of Nominal Target	100%		In Range	95-105%
Actual Fuel Load Density	160,2	kg/m ³		
<u>Kindling and Start-up Fuel</u>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)	0,628	kg		
Actual Kindling Wt.	0,582	kg	In Range	18,5%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	0,942	kg		
Actual Start-up Fuel Wt.	0,814	kg	In Range	25,9%
Allowable Residual Start-up Fuel Wt. Range	0,314 to 0,628	kg		Mid-Point
Actual Residual Start-up Fuel Wt.	0,350	kg	In Range	0,471
Total Wt. All Fuel Added (wet basis)	4,54	kg		
<u>High Fire Test Run End Point Range</u>				
	Low		High	Mid-Point
Based on Fuel Load Wt. (w/tares)	0,283	to	0,346	kg
Actual Fuel Load Ending Wt.	0,300	kg	In Range	

Fuel Piece Moisture Reading (%-dry basis)									
1	2	3	Ave.		Pc. Wt. Dry Basis				
19,8	19	20,9	19,9	In Range	1,133	lb	0,514	kg	
18,3	20,6	19,2	19,4	In Range	1,121	lb	0,509	kg	
19,2	19,6	19,6	19,5	In Range	1,113	lb	0,505	kg	
19,4	20,2	19,4	19,7	In Range	1,658	lb	0,752	kg	
19,6	21,1	23,9	21,5	In Range	0,753	lb	0,341	kg	
			NA	NA	NA	lb	NA	kg	
			19,9	In Range					
Total Load Ave. MC % (wet basis)				16,6					
Total Test Load Weight (dry basis)					→	5,777	lb	2,621	kg
<u>Kindling Moisture (%-dry basis)</u>									
10	10	10	10,0	In Range	0,529	lb	0,240	kg	
<u>Start-up Fuel Moisture Readings (%-dry basis)</u>									
19,6	22,1	21,9	21,2	In Range	0,672	lb	0,305	kg	
Total Wt. All Fuel Added (dry basis)					→	6,978	lb	3,17	kg
Total Wt. All Fuel Burned (dry basis)					→	6,328	lb	2,870	kg

Annex 6

Title: LF Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Imperial units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft ³ - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12,000	lb/ft ³		
Usable Firebox Volume	0,69246	ft ³		
Total Nom. Load Wt. Target	8,310	lb		
Total Load Wt. Allowable Range	7,894 to 8,725	lb		
Core Target Wt. Allowable Range	3,739 to 5,401	lb		
Remainder Load Wt. Allowable Range	2,908 to 4,570	lb		
			Mid-Point	
Core Load Fuel Pc. Wt. Allowable Range	1,246 to 2,077	lb		1,662
Remainder Load Pc. Wt. Allowable Range	0,831 to 2,493	lb		1,662
	Pc. #			
Core Load Piece Wt. Actual	1 1,567	lb	In Range	
	2 1,504	lb	In Range	
	3 1,567	lb	In Range	
Core Load Total. Wt. Actual	4,64	lb	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 2,240	lb	In Range	
(2 or 3 Pcs.)	2 1,272	lb	In Range	
	3	lb	NA	
Remainder Load Piece Weight Ratio - Small/Large	57%		In Range	≤ 67%
Remainder Load Tot. Wt. Act	3,512	lb	In Range	
Total Load Wt. Actual	8,150	lb	In Range	
Core % of Total Wt.	57%		In Range	45-65%
Remainder % of Total Wt.	43%		In Range	35-55%
Actual Load % of Nominal Target	98%		In Range	95-105%
Actual Fuel Load Density	11,770	lb/ft ³		
Allowable Charcoal Bed Wt. Range (lb)	0,865 to 1,580			Mid-Point
Actual Charcoal Bed Wt.	1,433	lb	In Range	1,223
Actual Fuel Load Ending Wt.	0,000	lb	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.	8,150	lb		

Fuel Piece Moisture Reading (%-dry basis)					Pc. Wt. Dry Basis				
1	2	3	Ave.						
20,1	20,8	21,7	20,9	In Range	1,297	lb	0,588	kg	
20,4	22	20,1	20,8	In Range	1,244	lb	0,564	kg	
18,6	19,5	19,2	19,1	In Range	1,316	lb	0,597	kg	
24,4	22,2	20,8	22,5	In Range	1,829	lb	0,830	kg	
22,6	20,2	22,3	21,7	In Range	1,045	lb	0,474	kg	
			NA	NA	NA	lb	NA	kg	
Total Load Ave. MC % (dry basis)				21,1	In Range				
Total Load Ave. MC % (wet basis)				17,4					
Total Test Load Weight (dry basis)						6,732	lb	3,053	kg
Total Fuel Weight Burned During Test Run (dry basis)						6,732	lb	3,053	kg

Metric units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft ³ - Low and Medium Fire				
Nominal Required Load Density (wet basis)	192,222	kg/m ³		
Usable Firebox Volume	0,01961	m ³		
Total Nom. Load Wt. Target	3,769	kg		
Total Load Wt. Allowable Range	3,581 to 3,958	kg		
Core Target Wt. Allowable Range	1,696 to 2,450	kg		
Remainder Load Wt. Allowable Range	1,319 to 2,073	kg		
			Mid-Point	
Core Load Fuel Pc. Wt. Allowable Range	0,565 to 0,942	kg		0,754
Remainder Load Pc. Wt. Allowable Range	0,377 to 1,131	kg		0,754
	Pc. #			
Core Load Piece Wt. Actual	1 0,711	kg	In Range	
	2 0,682	kg	In Range	
	3 0,711	kg	In Range	
Core Load Total. Wt. Actual	2,10	kg	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 1,016	kg	In Range	
(2 or 3 Pcs.)	2 0,577	kg	In Range	
	3	kg	NA	
Remainder Load Piece Weight Ratio - Small/Large	57%		In Range	≤ 67%
Remainder Load Tot. Wt. Act	1,593	kg	In Range	
Total Load Wt. Actual	3,697	kg	In Range	
Core % of Total Wt.	57%		In Range	45-65%
Remainder % of Total Wt.	43%		In Range	35-55%
Actual Load % of Nominal Target	98%		In Range	95-105%
Actual Fuel Load Density	188,543	kg/m ³		
Allowable Charcoal Bed Wt. Range (kg)	0,420 to 0,689			Mid-Point
Actual Charcoal Bed Wt.	0,650	kg	In Range	0,555
Actual Fuel Load Ending Wt.	0,000	kg	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.	3,697	kg		

Fuel Piece Moisture Reading (%-dry basis)									
1	2	3	Ave.		Pc. Wt. Dry Basis				
20,1	20,8	21,7	20,9	In Range	1,297	lb	0,588	kg	
20,4	22	20,1	20,8	In Range	1,244	lb	0,564	kg	
18,6	19,5	19,2	19,1	In Range	1,316	lb	0,597	kg	
24,4	22,2	20,8	22,5	In Range	1,829	lb	0,830	kg	
22,6	20,2	22,3	21,7	In Range	1,045	lb	0,474	kg	
			NA	NA	NA	lb	NA	kg	
Total Load Ave. MC % (dry basis)				21,1	In Range				
Total Load Ave. MC % (wet basis)				17,4					
Total Test Load Weight (dry basis)						6,731	lb	3,053	kg
Total Fuel Weight Burned During Test Run (dry basis)						6,731	lb	3,053	kg

Annex 7

Title: HF2 Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
 Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
 Values to be input manually

Imperial units 1

Appendix 7
 HF2 6. February

For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10,000	lb/ft ³		
Usable Firebox Volume	0,69246	ft ³		
Total Nom. Load Wt. Target	6,925	lb		
Total Load Wt. Allowable Range	6,600	to 7,300	lb	
Core Target Wt. Allowable Range	3,100	to 4,500	lb	
Remainder Load Wt. Allowable Range	2,400	to 3,800	lb	
				Mid-Point
Core Load Pc. Wt. Allowable Range	1,000	to 1,700	lb	1,350
Remainder Load Pc. Wt. Allowable Range	0,700	to 3,800	lb	2,250
	Pc. #			
Core Load Piece Wt. Actual	1	1,457	lb	In Range
	2	1,310	lb	In Range
	3	1,292	lb	In Range
Core Load Total. Wt. Actual		4,06	lb	In Range
	Pc. #			
Remainder Load Piece Wt.	1	1,969	lb	In Range
(1 to 3 Pcs.)	2	0,930	lb	In Range
	3		lb	NA
Remainder Load Tot. Wt. Act		2,899	lb	In Range
Total Load Wt. Actual		6,958	lb	In Range
Core % of Total Wt.		58%		In Range 45-65%
Remainder % of Total Wt.		42%		In Range 35-55%
Actual Load % of Nominal Target		100%		In Range 95-105%
Actual Fuel Load Density		10,0	lb/ft ³	
<u>Kindling and Start-up Fuel</u>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)		1,392	lb	
Actual Kindling Wt.		1,279	lb	In Range 18,4%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		2,087	lb	
Actual Start-up Fuel Wt.		1,790	lb	In Range 25,7%
Allowable Residual Start-up Fuel Wt. Range	0,696	to 1,392	lb	Mid-Point
Actual Residual Start-up Fuel Wt.		0,772	lb	In Range 1,044
Total Wt. All Fuel Added (wet basis)		10,03	lb	
<u>High Fire Test Run End Point Range</u>				
Based on Fuel Load Wt. (w/tares)	Low	0,626	to 0,765	High lb Mid-Point 0,696
Actual Fuel Load Ending Wt.		0,661	lb	In Range

Fuel Piece Moisture Reading (%-dry basis)									
1	2	3	Ave.		Pc. Wt. Dry Basis				
18,2	22,8	20,8	20,6	In Range	1,208	lb	0,548	kg	
18,2	21	18,8	19,3	In Range	1,097	lb	0,498	kg	
19,8	22,8	18,4	20,3	In Range	1,074	lb	0,487	kg	
19	22	20,2	20,4	In Range	1,635	lb	0,742	kg	
19,2	21,6	19,5	20,1	In Range	0,775	lb	0,351	kg	
			NA	NA	NA	lb	NA	kg	
			20,2	In Range					
Total Load Ave. MC % (wet basis)				16,8					
Total Test Load Weight (dry basis)					→	5,789	lb	2,626	kg
<u>Kindling Moisture (%-dry basis)</u>									
10	10	10	10,0	In Range	1,162	lb	0,527	kg	
<u>Start-up Fuel Moisture Readings (%-dry basis)</u>									
20,8	19,8	20,2	20,3	In Range	1,488	lb	0,675	kg	
Total Wt. All Fuel Added (dry basis)					→	8,440	lb	3,83	kg
Total Wt. All Fuel Burned (dry basis)					→	7,007	lb	3,178	kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
 Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
 Values to be input manually

Metric units 2

Appendix 7
 HF2 6. February

For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	160,185	kg/m ³		
Usable Firebox Volume	0,01961	m ³		
Total Nom. Load Wt. Target	3,141	kg		
Total Load Wt. Allowable Range	3,000 to 3,300	kg		
Core Target Wt. Allowable Range	1,400 to 2,000	kg		
Remainder Load Wt. Allowable Range	1,100 to 1,700	kg		
			Mid-Point	
Core Load Pc. Wt. Allowable Range	0,500 to 0,800	kg	0,650	
Remainder Load Pc. Wt. Allowable Range	0,300 to 1,700	kg	1,000	
	Pc. #			
Core Load Piece Wt. Actual	1	0,661 kg	In Range	
	2	0,594 kg	In Range	
	3	0,586 kg	In Range	
Core Load Total. Wt. Actual		1,84 kg	In Range	
	Pc. #			
Remainder Load Piece Wt.	1	0,893 kg	In Range	
(1 to 3 Pcs.)	2	0,422 kg	In Range	
	3		NA	
Remainder Load Tot. Wt. Act		1,315 kg	In Range	
Total Load Wt. Actual		3,156 kg	In Range	
Core % of Total Wt.		58%	In Range	45-65%
Remainder % of Total Wt.		42%	In Range	35-55%
Actual Load % of Nominal Target		100%	In Range	95-105%
Actual Fuel Load Density		161,0 kg/m ³		
<u>Kindling and Start-up Fuel</u>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)		0,631 kg		
Actual Kindling Wt.		0,580 kg	In Range	18,4%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		0,947 kg		
Actual Start-up Fuel Wt.		0,812 kg	In Range	25,7%
Allowable Residual Start-up Fuel Wt. Range	0,316 to 0,631	kg		Mid-Point
Actual Residual Start-up Fuel Wt.		0,350 kg	In Range	0,473
Total Wt. All Fuel Added (wet basis)		4,55 kg		
<u>High Fire Test Run End Point Range</u>				
Based on Fuel Load Wt. (w/tares)	Low 0,284 to High 0,347	kg		Mid-Point 0,316
Actual Fuel Load Ending Wt.		0,300 kg	In Range	

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
18,2	22,8	20,8	20,6	In Range	1,208 lb	0,548 kg
18,2	21	18,8	19,3	In Range	1,097 lb	0,498 kg
19,8	22,8	18,4	20,3	In Range	1,074 lb	0,487 kg
19	22	20,2	20,4	In Range	1,635 lb	0,742 kg
19,2	21,6	19,5	20,1	In Range	0,775 lb	0,351 kg
			NA	NA	NA lb	NA kg
			20,2	In Range		
Total Load Ave. MC % (wet basis)				16,8		
Total Test Load Weight (dry basis)					5,789 lb	2,626 kg
<u>Kindling Moisture (%-dry basis)</u>						
10	10	10	10,0	In Range	0,527 lb	0,239 kg
<u>Start-up Fuel Moisture Readings (%-dry basis)</u>						
20,8	19,8	20,2	20,3	In Range	0,675 lb	0,306 kg
Total Wt. All Fuel Added (dry basis)					6,992 lb	3,17 kg
Total Wt. All Fuel Burned (dry basis)					6,342 lb	2,876 kg

Annex 8

Title: MF Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Metric units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft ³ - Low and Medium Fire				
Nominal Required Load Density (wet basis)	192,222	kg/m ³		
Usable Firebox Volume	0,01961	m ³		
Total Nom. Load Wt. Target	3,769	kg		
Total Load Wt. Allowable Range	3,581 to 3,958	kg		
Core Target Wt. Allowable Range	1,696 to 2,450	kg		
Remainder Load Wt. Allowable Range	1,319 to 2,073	kg		
			Mid-Point	
Core Load Fuel Pc. Wt. Allowable Range	0,565 to 0,942	kg		0,754
Remainder Load Pc. Wt. Allowable Range	0,377 to 1,131	kg		0,754
	Pc. #			
Core Load Piece Wt. Actual	1 0,771	kg	In Range	
	2 0,725	kg	In Range	
	3 0,699	kg	In Range	
Core Load Total. Wt. Actual	2,20	kg	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 1,042	kg	In Range	
(2 or 3 Pcs.)	2 0,618	kg	In Range	
	3	kg	NA	
Remainder Load Piece Weight Ratio - Small/Large	59%		In Range	≤ 67%
Remainder Load Tot. Wt. Act	1,660	kg	In Range	
Total Load Wt. Actual	3,855	kg	In Range	
Core % of Total Wt.	57%		In Range	45-65%
Remainder % of Total Wt.	43%		In Range	35-55%
Actual Load % of Nominal Target	102%		In Range	95-105%
Actual Fuel Load Density	196,600	kg/m ³		
Allowable Charcoal Bed Wt. Range (kg)	0,436 to 0,721			Mid-Point
Actual Charcoal Bed Wt.	0,650	kg	In Range	0,578
Actual Fuel Load Ending Wt.	0,000	kg	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.	3,855	kg		

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
19,4	20,1	20	19,8	In Range	1,418	0,643
19,2	21,5	20,1	20,3	In Range	1,329	0,603
19,8	20,1	19,4	19,8	In Range	1,287	0,584
19,9	21,3	19,3	20,2	In Range	1,912	0,867
19,6	20,3	19,2	19,7	In Range	1,138	0,516
			NA	NA	NA	NA
Total Load Ave. MC % (dry basis)				20,0	In Range	
Total Load Ave. MC % (wet basis)				16,6		
Total Test Load Weight (dry basis)					7,084	3,213
Total Fuel Weight Burned During Test Run (dry basis)					7,084	3,213

Metric units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft ³ - Low and Medium Fire				
Nominal Required Load Density (wet basis)	192,222	kg/m ³		
Usable Firebox Volume	0,01961	m ³		
Total Nom. Load Wt. Target	3,769	kg		
Total Load Wt. Allowable Range	3,581 to 3,958	kg		
Core Target Wt. Allowable Range	1,696 to 2,450	kg		
Remainder Load Wt. Allowable Range	1,319 to 2,073	kg		
			Mid-Point	
Core Load Fuel Pc. Wt. Allowable Range	0,565 to 0,942	kg		0,754
Remainder Load Pc. Wt. Allowable Range	0,377 to 1,131	kg		0,754
	Pc. #			
Core Load Piece Wt. Actual	1 0,771	kg	In Range	
	2 0,725	kg	In Range	
	3 0,699	kg	In Range	
Core Load Total. Wt. Actual	2,20	kg	In Range	
	Pc. #			
Remainder Load Piece Wt.	1 1,042	kg	In Range	
(2 or 3 Pcs.)	2 0,618	kg	In Range	
	3	kg	NA	
Remainder Load Piece Weight Ratio - Small/Large	59%		In Range	≤ 67%
Remainder Load Tot. Wt. Act	1,660	kg	In Range	
Total Load Wt. Actual	3,855	kg	In Range	
Core % of Total Wt.	57%		In Range	45-65%
Remainder % of Total Wt.	43%		In Range	35-55%
Actual Load % of Nominal Target	102%		In Range	95-105%
Actual Fuel Load Density	196,600	kg/m ³		
Allowable Charcoal Bed Wt. Range (kg)	0,436 to 0,721			Mid-Point
Actual Charcoal Bed Wt.	0,650	kg	In Range	0,578
Actual Fuel Load Ending Wt.	0,000	kg	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.	3,855	kg		

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
19,4	20,1	20	19,8	In Range	1,418	0,643
19,2	21,5	20,1	20,3	In Range	1,329	0,603
19,8	20,1	19,4	19,8	In Range	1,287	0,584
19,9	21,3	19,3	20,2	In Range	1,912	0,867
19,6	20,3	19,2	19,7	In Range	1,138	0,516
			NA	NA	NA	NA
Total Load Ave. MC % (dry basis)				20,0	In Range	
Total Load Ave. MC % (wet basis)				16,6		
Total Test Load Weight (dry basis)					7,084	3,213
Total Fuel Weight Burned During Test Run (dry basis)					7,084	3,213

Annex 9

Title: Manufacturers instruction for testing procedure

Pages total: 3, excl this cover page

Manufacturers instruction for testing procedure according to ASTM E3053-17 Morsø 2B Standard 2020 High Fire Procedure

Test Fuel:

Recommended test fuel species is beech.

The guidelines of the Cordwood standard E3053-17 are followed in regards of moisture content and weight ratios for kindling, startup, core and sub loads.

The nominal length for High Burn core and sub load is 13" (33 cm.)

The usable firebox volume is 0.692460 ft³ (0,0196082 m³)

Kindling and Startup:

The Start-up load is added to the kindling load. Ignited together in the same batch.

A "top-down" approach is used when igniting the fire.

The firebox is deep and narrow. To make things simple keep the length of kindling and start-up pieces just about the same length as the minimum width of the firebox.



Left to right:

- Startup load. Consist of 6-8 pieces. Weight of each pieces varies from 100-150 grams. Diameter 3 cm to 5 cm.
- Kindling, medium size. Consist of pieces with a weight of 30-60 grams. Diameter 1 cm to 2 cm.
- Kindling, small size. Consist of pieces with a weight up to 20 grams. Diameter approximate 0.5 cm



Start-up load at the bottom, distributed in two layers. Each layer is perpendicular to each other. Next, on top of the startup load, the medium sized kindling is distributed in two to three layers. These layers are also perpendicular to each other. Finally, the smallest kindling pieces is placed loosely on top, all in the same direction, stove front to stove back.

On top of the wood, place one or two fire-starters. Re-arrange a couple of the top kindling pieces so they support the fire-starters on the sides. This will prevent the fire-starters from falling off and ease ignition of the wood.

Keep a $\approx 2''$ distance from the load to the baffle. If there is too much wood in the stack to comply with this, then take the remaining kindling pieces and lay next to the main stack.

Load ignition

Set the air controller at maximum setting and fully open the stove door.

Build the start-up and kindling wood-stack as described. The wood-stack should be centered in the middle of the hearth.

Ignite one of the fire-starters with a gas torch.

Close the door immediately after ignition

High Fire loading and ignition:

The charcoal bed for the High Fire should be at the lower end of the allowable range. But keep an eye on the charcoal bed, don't wait to the very end of the range, if the charcoal bed seems to burn out and getting too cold.



High Fire Load sample
Nominal length 13''



High Fire Load sample
Arrangement

The High Fire fuel load consist of five pieces. The preferred configuration of the load is a bottom layer of three pieces and second layer on top with two pieces. The load should be stacked compact without much air between each piece.

It is important that the fuel load height is kept below the path of the secondary air outlet stream (baffle plate)

Start the High Fire by fully open the stove door. Keep the air controller setting at maximum. If the burnt Kindling and Start-up wood-stack hasn't collapsed completely, even out the charcoal pieces with a poker. The bigger charcoal pieces should be poked to the front end of the hearth. Next load the fuel, keep a distance between fuel load and the back wall of the firebox of approximately 0.5''-1'' (1.25 cm-2.5 cm).

The load should ignite rapidly

When the fire is steady close the door. This will take approximately 1 minute. Keep air controller fully open.

The High Fire should be stopped at the lower end of the allowable weight range.

Manufacturers instruction for testing procedure
according to ASTM E3053-17
Morsø 2B Standard Medium and Low Fire Procedure

Test Fuel:

Recommended test fuel species is beech.

The guidelines of the Cordwood standard E3053-17 are followed in regards of moisture content and weight ratios for kindling, startup, core and sub loads.

The nominal length for Low and Medium Burn core and sub load is 13" (33 cm.)

The usable firebox volume is 0.692460 ft³ (0,0196082 m³)

Low and Medium Fire loading and ignition:

The Low and Medium Fire test is much like the High Fire, regarding both test procedure and load arrangement.

The Low/Medium Fire fuel load consist of five pieces. The preferred configuration of the load is a bottom layer of three pieces and second layer on top with two pieces. The load should be stacked compact without much air between each piece.

It is important that the fuel load height is kept below the path of the secondary air outlet stream (baffle plate)

Start the Low/Medium Fire by fully open the stove door. Keep the air controller setting at maximum. Even out the charcoal pieces on the hearth with a poker. Next load the fuel, keep a distance between fuel load and the back wall of the firebox of approximately 0.5"-1" (1.25 cm-2.5 cm).

The load should ignite rapidly.

When the fire is steady close the door. This will take approximately 1-2 minute.

Adjust and set the primary air controller at latest, half a minute before the allowable timeframe closes. The Low Fire setting is ¾ turn on the air controller valve. Medium Fire setting is 1½ turn on the air controller valve.

Low and Medium Fire Test Run Completion-The test run is completed when the scale indicates the remaining weight of the test fuel load is 0.0 lb. (0.00 kg) or less for 30 s OR if at least 90 % of the test fuel load weight has been consumed and there is no measurable weight loss (<0.1 lb (0.05 kg) or 1.0 % of the test fuel load weight, whichever is greater) for at least 30 min.

Annex 10

Title: Manufacturers description of the wood heater

Pages total: 1, excl this cover page

WOOD HEATER INFORMATION

Appliance Manufacturer: Morsø Jernstøberi A/S

Wood Stove Model: 2B Standard 2020

Type: Freestanding, radiant-type wood fired room heater.

WOOD HEATER DESCRIPTION

Materials of Construction: The unit is constructed primarily of cast iron with a stainless-steel secondary combustion air supplying baffle. The firebox is lined with molded vermiculite firebricks. The feed door has a 150 mm by 130 mm glass panel and an 8 mm diameter fiberglass gasket.

Air Introduction System: Air enters the firebox through a spin-draft located at the front of the appliance at the top of the fuel-loading door. Secondary air enters the appliance through the upper back and supplies a three-step, tiered hollow baffle.

Combustion Control Mechanisms: The combustion air inlet is controlled by a spin-draft located at the top of the fuel-loading door in the center of the appliance. Only the primary combustion air is adjustable, the secondary combustion air is fixed.

Combustor: N/A

Internal Baffles: A hollow, tiered baffle with a cast iron extension baffle is mounted in the upper portion of the firebox. The flame path is forced to the front of the firebox where it travels up through the opening between the baffle and primary air manifold. A ceramic wool blanket is employed on the top of the baffle.

Other Features: None

Flue Outlet: The 5" diameter flue outlet is located at the rear top end of the appliance.

Annex 11

Title: Chimney configuration

Pages total: 1, excl this cover page

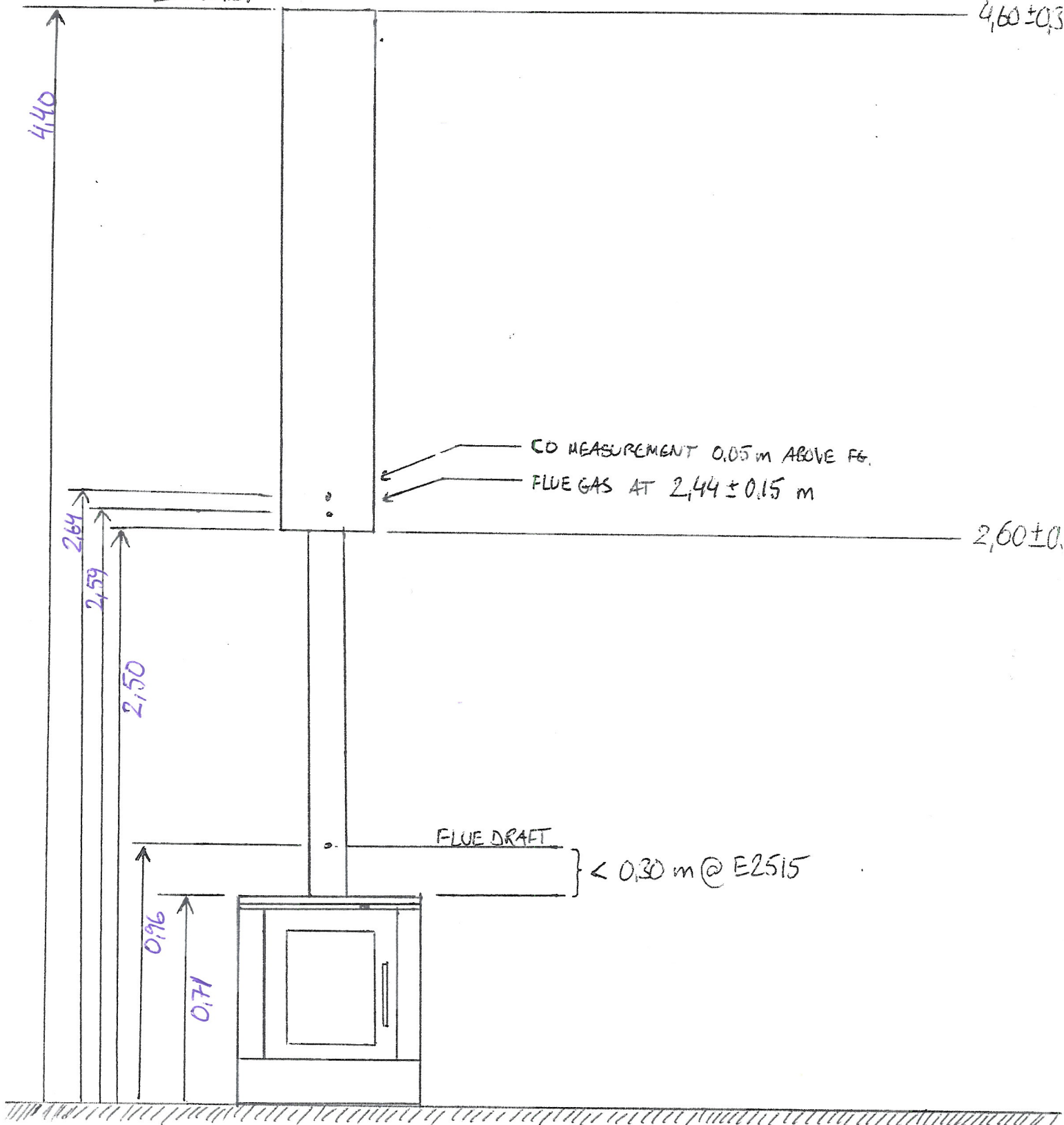
EPA TEST FLUE/CHIMNEY

STOVE: MORSØ 2B Std. 2020

DATE OF TEST: 5. FEBRUARY 2020

NOMINAL
MEASUREMENT

ACTUAL MEAS.



Annex 13

Title: Calibration certificates

Pages total: 79, excl this cover page

Internt kalibreringscertifikat vedr. kalibrering af vægte i DTI's laboratorier					Afdeling: DTI/ Energi	Laboratorium: ELAB
Obligatorisk for vægte, som anvendes til vejninger, der er omfattet af DTI's DANAKs akkrediteringer, bortset fra akkreditering nr. 200. Certifikatet må i uddrag kun gengives, såfremt DTI's kvalitetschef har godkendt uddraget.					Afdelingsnummer: 270	Certifikatnummer: ELAB-38-2019
Dato for kalibrering/klassificering af lodder: 12.11.2014/F1 09.04.2014 /M2 + ukendte 15x20kg fra murværk, 300kg i alt	Dato for modtagelse af lodder: 16.09.2019	Dato for kalibreringens udførelse: 18.09.2019	Certifikatdato: 23.09.2019	Vedr. akkr. Nr.: 300	Sidenummer: Side 1 af 1	
Identifikation den kalibrerede vægt: 270-A-1638, KC 600, 600kg, Stand C				Ansvarlig:	Antal bilag:	
Vægtens max-kapacitet: 600kg	Vægtens deling i 1. range: d =1g	Vægtens deling i 2. range:	Vægtens kalibreringsværdi i 1. range: e =	Vægtens kalibreringsværdi i 2. range:	Vægtens serienummer:	
Kontrol af nivellering, nulpunkt og taraindretning					Temperatur: 22	
Ved kalibreringens start:						
Viser vægten nul i ubelastet tilstand?			x ja			
Er taraindretningen frakoblet?			x ja			
Står vægten stabilt og vandret?			x ja			
Vejep prøve					Overholdt: <input checked="" type="checkbox"/> Ja <input type="checkbox"/> Nej	
Belastningspunkt B	Visning, opvejning; I	Visning, nedvejning; I	Evt. tillægslast; opvejning/nedvejning	Fejlvisning, opvejning; F	Fejlvisning, nedvejning; F	
0,0 kg	0,000	0,000		0	0	
1,0 kg	1,000	1,002		0	0,002	
6,0 kg	6,001	6,003		0,001	0,003	
16,0 kg	16,002	16,004		0,002	0,004	
100,0 kg	99,990	99,992		-	-	
106,0 kg	105,988	105,991		-0,002	-0,001	
116,0 kg	115,989	115,990		-0,001	-0,002	
200,0 kg	199,928	199,940		-	-	
206,0 kg	205,927	205,920		-0,001	-0,020	
300,0 kg	299,901	299,904		-	-	
306,0 kg	305,901	305,901		0,000	-0,003	
Undersøgelse af repetérbarhed					Overholdt: <input checked="" type="checkbox"/> Ja <input type="checkbox"/> Nej	
Ca. 10 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning	
40,0 kg	40,005	40,004	40,004	40,005	40,004	
Ca. 80 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning	
80,0 kg	79,999	79,999	79,999	79,999	79,998	
Prøvning af excentricitet					Overholdt: <input checked="" type="checkbox"/> Ja <input type="checkbox"/> Nej	
Ca. 33 % af Max	1. vejning (HB)	2.vejning (VB)	3.vejning (VT)	4.vejning (HT)	DIFF	
120,0 kg	119,942	119,974	119,965	119,952	0,032kg	
Metodegrundlag: Institutprocedure nr. 900-6.0-1	Sporbarhed på anvendte lodder (oplys certifikatnummer og dato): 200-P-22776 (F1) og 200-P-22557 (M2)			Kalibreringen er udført af: KMSA	Godkendt af:	

Grøn

Kalibrering af løse termofølere i EPA stand E

Måleskema til kontrol af termofølere i stand E (EPA)

Dato: 17-09-2019 Udført af: KMSA

Brændeovnsprøvestand: E (c) Emne Id nr.: 145092

Certifikat nr.: ELAB-38-2019

Kalibrator ref.: 270-A-0912 (Jofra) #nye korr.
kopieret fra øverste filterrækker

PC indgang	Sand temp.	Vist temp.	Fejl	(Brugt ved Kalibrering)		(Ny valgt korr.)		Ber. Uden korr.	Ber. Ny korr.	Ber. Ny fejl.	Krav	
				Aktuel Korrektion Konst.	1. gard	Ny Korrektion Konst.	1. grad					
Rum temp.	-1	30	30,04	0,04	0,1	1	0,1	1	29,9	30,0	0,0	1
Filter-1-H A	-2	30	29,78	-0,22	0,1	1	0,3	1	29,7	30,0	0,0	1
Filter-2-D1 A	-3	30	29,82	-0,18	0,1	1	0,3	1	29,7	30,0	0,0	1
Filter-3-D2 A	-4	30	29,67	-0,33	0,2	1	0,6	1	29,5	30,1	0,1	1
Filter-4-R A	-5	30	29,49	-0,51	0,2	1	0,5	1	29,3	29,8	-0,2	1
Køler-1-H	-6	30	29,71	-0,29	0,2	1	0,5	1	29,5	30,0	0,0	1
Køler-2-D	-7	30	29,51	-0,49	0,4	1	0,9	1	29,1	30,0	0,0	1
Gasm-H	-8	30	29,64	-0,36	0,4	1	0,8	1	29,2	30,0	0,0	1
Gasm-D	-9	30	29,58	-0,42	0,4	1	0,8	1	29,2	30,0	0,0	1
Gasm-R	-10	30	29,67	-0,33	0,2	1	0,5	1	29,5	30,0	0,0	1
Gas-Disp	-11	30	29,66	-0,34	0,3	1	0,6	1	29,4	30,0	0,0	1
Løs føler tilknyttet		30	29,9	-0,1	0,1	1			29,8	0,0	-30,0	2
Filter-1-H B	-2	30	29,68	-0,32	0,1	1	0,3	1	29,6	29,9	-0,1	1
Filter-2-D1 B	-3	30	29,7	-0,3	0,1	1	0,3	1	29,6	29,9	-0,1	1
Filter-3-D2 B	-4	30	29,49	-0,51	0,2	1	0,6	1	29,3	29,9	-0,1	1
Filter-4-R B	-5	30	29,78	-0,22	0,2	1	0,5	1	29,6	30,1	0,1	1

12.09.2018 Kalibrering, Se særskilt kal. Dokument

12.09.2018 Kalibrering, Se særskilt kal. Dokument

ikke monteret (ikke til stede i logger-opsætning)

Kalibrering af løse termofølere i brændeovnsprøvestand B, C og D

Måleskema til kontrol af termofølere i stand B, C og D

Dato: 16-09-2019 Udført af: KMSA
 Brændeovnsprøvestand: C Emne Id nr.: 134396
 Certifikat nr.: ELAB-38-2019
 Kalibrator ref.: 270-A-0912 (Jofra) #Ny indtastet 2019

PC indgang	Sand temp.	Vist temp.	Fejl	(Brugt ved Kalibrering)		(Ny valgt korr.)		Ber. Uden korr.	Ber. Ny korr.	Ber. Ny fejl.	Krav
				Aktuel Korrektion Konst.	1. gard	Ny Korrektion Konst.	1. grad				
Rum temp.	30	30,1	0,1	0	1	-0,1	1	30,1	30,0	0,0	1,5
Br.rum	85	84,5	-0,5	0,9	1	1,4	1	83,6	85,0	0,0	2
Konv.	85	83,5	-1,5	0	1	1,5	1	83,5	85,0	0,0	3
Gasmåler	85	85,3	0,3	0	1	0	1	85,3	85,3	0,3	2
Disp-T1	85	84,7	-0,3	0	1	0,3	1	84,7	85,0	0,0	2
Disp-T2	85	85,2	0,2	0	1	-0,2	1	85,2	85,0	0,0	2
Disp-T3	85	84,5	-0,5	0	1	0,5	1	84,5	85,0	0,0	2
Disp-T4	85	85,5	0,5	0	1	-0,5	1	85,5	85,0	0,0	2
Disp-T5	85	85,4	0,4	0	1	-0,4	1	85,4	85,0	0,0	2
Disp-K6	85	85,7	0,7	0	1	-0,7	1	85,7	85,0	0,0	2
Disp-K7	85	84,4	-0,6	0	1	0,6	1	84,4	85,0	0,0	2
Disp-K8	85	85,8	0,8	0	1	-0,8	1	85,8	85,0	0,0	2
Disp T Bag (disponibel-T)	85	85	0	0	1	0	1	85,0	85,0	0,0	2
Disp T side	#1/T	#1/T	#1/T			0		#1/T	#1/T	#1/T	2
Disp 1K	#1/T	#1/T	#1/T			0		#1/T	#1/T	#1/T	2
Disp 2K	#1/T	#1/T	#1/T			0		#1/T	#1/T	#1/T	2
Røg EN	85	85,4	0,4	0	1	-1	1	85,4	84,4	-0,6	5
Røg EN	250	251,6	1,6	0	1	-1	1	251,6	250,6	0,6	5
Røg EN	350	351,3	1,3	0	1	-1	1	351,3	350,3	0,3	5
NS røg	85	83,7	-1,3	-1,9	1	-1,3	1	85,6	84,3	-0,7	2
NS røg	250	249,3	-0,7	-1,9	1	-1,3	1	251,2	249,9	-0,1	2
NS røg	350	349,4	-0,6	-1,9	1	-1,3	1	351,3	350,0	0,0	2
Før Kat.	85	86,5	1,5	1,5	1	-1,3	1	85,0	83,7	-1,3	3
Før Kat.	250	254,1	4,1	1,5	1	-1,3	1	252,6	251,3	1,3	3
Før Kat.	350	354	4	1,5	1	-1,3	1	352,5	351,2	1,2	3
Ovf. Top	85	84,4	-0,6	-1	1	-0,5	1	85,4	84,9	-0,1	1
Ovf. Top	250	249,4	-0,6	-1	1	-0,5	1	250,4	249,9	-0,1	1
Ovf. Top	350	349,6	-0,4	-1	1	-0,5	1	350,6	350,1	0,1	1
Ovf. Bag	85	83,9	-1,1	1,5	1	2,1	1	82,4	84,5	-0,5	1
Ovf. Bag	250	249,3	-0,7	1,5	1	2,1	1	247,8	249,9	-0,1	1
Ovf. Bag	350	349,7	-0,3	1,5	1	2,1	1	348,2	350,3	0,3	1
Ovf. Side-1	85	82	-3	-2	0,99	1,4	0,99	84,8	85,4	0,4	1
Ovf. Side-1	250	247,2	-2,8	-2	0,99	1,4	0,99	251,7	250,6	0,6	1
Ovf. Side-1	350	346	-4	-2	0,99	1,4	0,99	351,5	349,4	-0,6	1
Ovf. Side-2	85	83,7	-1,3	0,5	1	1,8	1	83,2	85,0	0,0	1
Ovf. Side-2	250	249	-1	0,5	1	1,8	1	248,5	250,3	0,3	1
Ovf. Side-2	350	348,4	-1,6	0,5	1	1,8	1	347,9	349,7	-0,3	1
Ovf. Bund	85	82,1	-2,9	-2	0,99	0,5	0,99	84,9	84,6	-0,4	1
Ovf. Bund	250	248	-2	-2	0,99	0,5	0,99	252,5	250,5	0,5	1
Ovf. Bund	350	347,1	-2,9	-2	0,99	0,5	0,99	352,6	349,6	-0,4	1



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8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-E-20811

Side 1 af 3
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Datalogger

Fabrikat:	Hewlett Packard A/S	Model:	34970A
Serienr.:	MY44006319	Kundemærke:	270-A-1992
Område:	mV, V, mA	Klasse:	-
Inddeling:	0,001 mV / 0,00001 V / 0,0001 V	Type:	-
Udgangssignal:	-	Diameter:	-
Tilbehør:	-		

Rekvisitionsnr.: MXB

Periode: Modtaget: 09-09-2019 Kalibreret: **10-09-2019**

Procedure: D1-7.1 & D1-7.3

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Javier I. Camacho, 72 20 25 92, jcam@teknologisk.dk

**Godkendt og
digitalt signeret
30-09-2019 af:**

Jan Nielsen
Cand. Scient



DANAK
CAL Reg.nr. 200

TERMOMETRILABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019-09-10

Certifikat : 200-E-20811

Side:

2 af 3

KALIBRERINGS CERTIFIKAT

Voltmeter: Udført på kabel mrk.1 i logger kanal 201

Område	Referenceværdi (Indstilling)	Aflæsning	Fejl	Usikkerhed
100 mV	0,000 mV	0,000 mV	1,0E-07 V	5,9E-07 V
100 mV	100,000 mV	100,004 mV	4,0E-06 V	2,8E-06 V
1 V	0,00000 V	0,00000 V	0,0E-06 V	5,8E-06 V
1 V	1,00000 V	1,00003 V	3,5E-05 V	1,3E-05 V
10 V	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
10 V	1,0000 V	1,0000 V	2,0E-05 V	5,9E-05 V
10 V	2,0000 V	2,0000 V	4,0E-05 V	6,2E-05 V
10 V	5,0000 V	5,0001 V	9,8E-05 V	8,8E-05 V
10 V	10,0000 V	10,0002 V	1,9E-04 V	1,3E-04 V

Kalibrering af mA loggere

Område & Input 10 V 20 mA	Referenceværdi	Aflæsning	Fejl	Usikkerhed
Kabel: 12 Kanal: 112	0,0000 V 2,0000 V	0,0000 V 1,9999 V	0,0E-05 V -0,6E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 13 Kanal: 113	0,0000 V 2,0000 V	0,0000 V 2,0004 V	0,0E-05 V 4,4E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 26 Kanal: 301	0,0000 V 2,0000 V	0,0000 V 2,0001 V	0,0E-05 V 1,3E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 27 Kanal: 302	0,0000 V 2,0000 V	0,0000 V 2,0003 V	0,0E-05 V 2,8E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 28 Kanal: 303	0,0000 V 2,0000 V	0,0000 V 2,0008 V	0,0E-05 V 7,7E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 29 Kanal: 304	0,0000 V 2,0000 V	0,0000 V 2,0006 V	0,0E-05 V 5,8E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 30 Kanal: 305	0,0000 V 2,0000 V	0,0000 V 1,9998 V	0,0E-05 V -2,4E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 31 Kanal: 306	0,0000 V 2,0000 V	0,0000 V 1,9997 V	0,0E-05 V -3,5E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 32 Kanal: 307	0,0000 V 2,0000 V	0,0000 V 1,9995 V	0,0E-05 V -5,0E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 33 Kanal: 308	0,0000 V 2,0000 V	0,0000 V 1,9995 V	0,0E-05 V -5,1E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 34 Kanal: 309	0,0000 V 2,0000 V	0,0000 V 1,9990 V	0,0E-05 V -10,0E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 35 Kanal: 310	0,0000 V 2,0000 V	0,0000 V 1,9991 V	0,0E-05 V -9,1E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 36 Kanal: 311	0,0000 V 2,0000 V	0,0000 V 2,0000 V	0,0E-05 V 0,4E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 37 Kanal: 312	0,0000 V 2,0000 V	0,0000 V 2,0007 V	0,0E-05 V 7,0E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 38 Kanal: 313	0,0000 V 2,0000 V	0,0000 V 1,9995 V	0,0E-05 V -5,0E-04 V	5,8E-05 V 1,9E-04 V
Kabel: 39 Kanal: 314	0,0000 V 2,0000 V	0,0000 V 2,0004 V	0,0E-05 V 3,7E-04 V	5,8E-05 V 1,9E-04 V

TERMOMETRILABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019-09-10

Certifikat : 200-E-20811

Side:

3 af 3

KALIBRERINGS CERTIFIKAT

Kalibrering af TC Type K : Udført på logger kanal 202 (*)

Input	Referenceværdi (Simuleret TC-Temp.)	Aflæsning	Fejl	Usikkerhed
0,0000 mV	0,0 °C	0,3 °C	3,0E-01 °C	1,2E-01 °C
4,0920 mV	100,0 °C	100,3 °C	2,8E-01 °C	1,3E-01 °C
8,1385 mV	200,0 °C	200,3 °C	3,4E-01 °C	1,3E-01 °C
16,3971 mV	400,0 °C	400,3 °C	3,0E-01 °C	1,2E-01 °C
24,9055 mV	600,0 °C	600,3 °C	2,8E-01 °C	1,3E-01 °C

Kalibrering af TC Type T : Udført på logger kanal 203 (*)

Input	Referenceværdi (Simuleret TC-Temp.)	Aflæsning	Fejl	Usikkerhed
0,0000 mV	0,0 °C	0,0 °C	0,0E-01 °C	1,2E-01 °C
2,0357 mV	50,0 °C	50,0 °C	0,0E-01 °C	1,2E-01 °C
4,2785 mV	100,0 °C	100,0 °C	0,0E-01 °C	1,2E-01 °C
6,7041 mV	150,0 °C	150,0 °C	0,0E-01 °C	1,2E-01 °C
9,2881 mV	200,0 °C	200,0 °C	0,0E-01 °C	1,2E-01 °C

(*) Thermocouple Test med ekstern cold junction v. 0 °C - elektromotorisk kraft defineret i DS/EN 60584-1:2014

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Rumtemperatur: 23 °C ± 1 °C

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

	KONTROL AF TRYKMÅLERE
CP	Test af kontinuerligt registrerende trykmålere
Side 1 af 1	Udstedt af: ELAB



Logbog/kontrol – Autotran 700/ACI tryktransmittere

Emne nr.: Id nr.: 148231 (0-60Pa)

Placering: Stand C, Pd

Dato: 16-09-2019

Certifikat nr.: ELAB-38-2019

Signatur: MXB

Ref. Udstyr: 270-A-2406 TSI

Ca. Målepunkt [Pa] (0-25,4Pa)	Ca. Målepunkt [Pa] (0-60Pa)	Reference [Pa] (1 decimal)	Aflæst tryk [Pa] (1 decimal)	Fejl [Pa]
0	0	0,0	0,0	
4	5	5,0	5,0	
8	10	10,4	10,3	
12	15	15,2	15,0	
16	20	20,5	20,2	
20	40	40,0	39,6	
24	55	55,2	54,9	

Grøn OK

 DANISH TECHNOLOGICAL INSTITUTE	KONTROL AF TRYKMÅLERE	
CP	Test af kontinuerligt registrerende trykmålere	
Side 1 af 1	Udstedt af: ELAB	

Logbog/kontrol – Autotran 700/ACI tryktransmittere

Emne nr.: Id nr. 94839 (0-254Pa)

Placering: Stand C, Ps

Dato: 16-09-2019

Certifikat nr.: ELAB-38-2019

Signatur: MXB

Ref. Udstyr: 270-A-2406 TSI

Ca. målepunkt [Pa] (0-25,4Pa)	Ca. målepunkt [Pa] (0-250 Pa)	Reference [Pa] (1 decimal)	Aflæst tryk [Pa] (1 decimal)	Fejl [Pa]
0	0	0,0	-0,2	
4	5	4,8	4,7	
8	10	10,0	9,9	
12	20	20,6	20,3	
16	50	51,7	51,3	
20	100	104,0	104,5	
24	240	242,0	243,0	

Grøn



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-T-22933

Side 1 af 3
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Tørblok kalibrator

Fabrikat:	JOFRA	Model:	650 SE
Serienr.:	901326	Kundemærke:	270-A-912
Område:	30 - 500°C	Inddeling:	0,1 °C
Tilbehør:	1 stk. indstats. Mærket "B 1/4".		

Rekvissionsnr.: MXB

Periode: Modtaget: 22-08-2019 Kalibreret: **27-08-2019**

Procedure: D1-5.1

Bemærkninger: Kalibreringen er foretaget med en referenceføler med en diameter på 5,8 mm. Der benyttes et isoleringsrør som placeres omkring referenceføleren, ovenpå blokken. Røret er foret med mineraluld og har en højde på ca. 150 mm (Ø 25 mm). Mellem blokken og isoleringsrør er der isoleret med mineraluld. Aksial inhomogenitet og temperaturinstabilitet for kalibratoren er undersøgt i overensstemmelse med EURAMET cg-13 Version 3.0 (02/2015). Radial inhomogenitet ikke undersøgt pga. indsatsens udformning.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Bjørn Kjærsgaard Nielsen, 72203534, bjni@teknologisk.dk

**Godkendt og
digitalt signeret
27-08-2019 af:**

Søren Andersen

Søren Lindholt Andersen
Konsulent, Ph.d.



DANAK
CAL Reg.nr. 200

TEMPERATURLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-T-22933

Side 2 af 3

KALIBRERINGSCERTIFIKAT
Resultater

Kalibrator mærket: 270-A-912

Reference- værdi °C	Aflæsning °C	Fejl °C	Usikkerhed °C	Note
29,98	30,00	0,02	0,26	
85,05	85,00	-0,05	0,26	
150,12	150,00	-0,12	0,26	
250,16	250,00	-0,16	0,26	
350,19	350,00	-0,19	0,26	
500,20	500,00	-0,20	0,26	

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

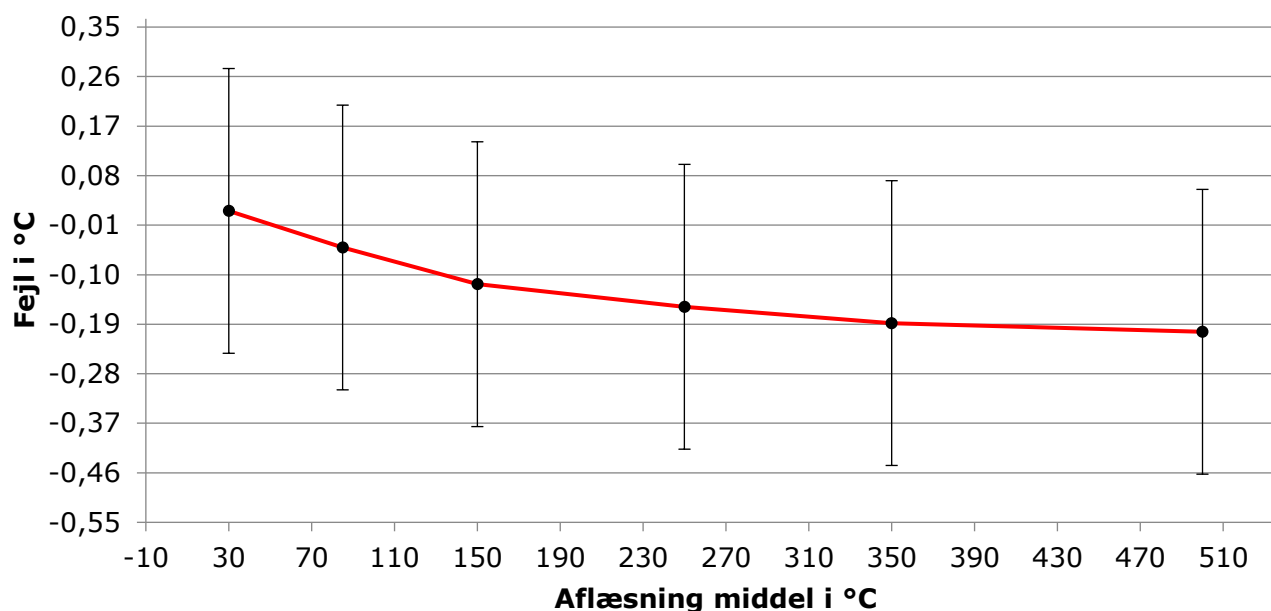
Certifikat nr.: 200-T-22933

Side 3 af 3

KALIBRERINGSCERTIFIKAT

Fejlkurve

Kalibrator mærket: 270-A-912



Kun de markerede punkter er målt.

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Alle temperaturer er i henhold til ITS90

Kalibreringsforhold:

Rumtemperatur: $23,8 \text{ °C} \pm 2,2 \text{ °C}$
Relativ fugtighed: $63,1 \text{ \%rh} \pm 7,1 \text{ \%rh}$
Barometerstand: $1021,5 \text{ mbar} \pm 2,6 \text{ mbar}$

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Internt kalibreringscertifikat vedr. kalibrering af vægte i DTI's laboratorier					Afdeling: DTI/ Energi	Laboratorium: ELAB
Obligatorisk for vægte, som anvendes til vejninger, der er omfattet af DTI's DANAK akkrediteringer, bortset fra akkreditering nr. 200. Certifikatet må i uddrag kun gengives, såfremt DTI's kvalitetschef har godkendt uddraget.					Afdelingsnummer: 270	Certifikatnummer: ELAB-38-2019
Dato for kalibrering/klassificering af lodder: 12.11.2014/FI og 09.04.2014/M2	Dato for modtagelse af lodder: 16.09.2019	Dato for kalibreringens udførelse: 16.09.2019	Certifikatdato: 16.09.2019	Vedr. akkr. Nr.: 300	Sidenummer: Side 1 af 1	
Identifikation den kalibrerede vægt: Mettler Toledo - 270-A-1989				Ansvarlig:	Antal bilag:	
Vægtens max-kapacitet: 15kg	Vægtens deling i 1. range: d = 1g	Vægtens deling i 2. range:	Vægtens kalibreringsværdi i 1. range: e =	Vægtens kalibreringsværdi i 2. range:	Vægtens serienummer: 2738141	
Kontrol af nivellering, nulpunkt og taraindretning					Temperatur: 22,4	
Ved kalibreringens start:						
Viser vægten nul i ubelastet tilstand?			x ja			
Er taraindretningen frakoblet?			x ja			
Står vægten stabilt og vandret?			x ja			
Vejeprove					Overholdt Ja Nej X*	
Belastningspunkt B - kg	Visning, opvejning; I	Visning, nedvejning; I	Evt. tillægslast;a opvejning/nedne jning	Fejlvisning, opvejning; F	Fejlvisning, nedvejning; F	
0,000	0,000	0,000		-	-	
0,005	0,005	0,005		-	-	
0,050	0,050	0,050		-	-	
0,200	0,200	0,200		-	-	
0,500	0,499	0,500		-0,001g	-	
1,000	0,999	0,999		-0,001g	-0,001g	
2,000	1,999	1,999		-0,001g	-0,001g	
7,000	6,994	6,994		-0,006g	-0,006g	
12,000	11,988	11,989		-0,012g	-0,011g	
Undersøgelse af repeterbarhed					Overholdt xJa □Nej	
Ca. 10 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning	
1,000kg	0,999	0,999	0,999	0,999	0,999	
Ca. 80 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning	
10,000kg	9,991	9,991	9,991	9,991	9,991	
Prøvning af excentricitet					Overholdt xJa □Nej	
Ca. 33 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	Diff.:	
5,000kg	4,995	4,995	4,996	4,996	0,001kg	
Metodegrundlag: Institutprocedure nr. 900-6.0-1	Sporbarhed på anvendte lodder (oplys certifikatnummer og dato): 200-P-22776 (F1) og 200-P-22557 (M2)			Kalibreringen er udført af: REHV	Godkendt af:	

GUL

*krav EN 5/10 gram hhv. under/over 7,5kg overskredet med 1g (under 7,5kg) og 2g (over 7,5kg).

Y:\Labspace\LAB2C_Labspace\Kalibrering Arbejdskopi\2019\EPA-Certifikater 3Kv 2019\09-Mettler Toledo, 270-A-1989, 15kg.docx



TEKNOLOGISK INSTITUT

Teknologiparken
Kongsvangs Allé 29
8000 Aarhus C
Tlf. +45 72 20 20 00

info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR:

200-A-162-1230

Side 1 af 2
Antal bilag: 0

Rekvirent: Teknologisk Institut
Kongsvang Allé 29,
8000 Aarhus
Att.: Max Bjerum

Emne:

Type:	Digital Vægt	Kundemærke:	7084
Fabrikat:	Mettler Toledo	Måleområde:	0-220 g
Model:	XS 204	Serienr.:	B042079566

Modtaget dato: 14-10-2019

Kalibreringsdato: 14-10-2019

Testmetode: Auto D1-10.1

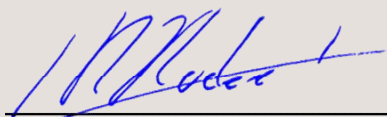
Kalibreringssted: Teknologisk Institut, Kongsvang Allé 29 - 0

Sporbarhed: Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

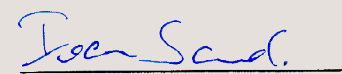
Bemærkninger: Resultatet af kalibreringen fremgår af de efterfølgende sider

Vilkår: Kalibreringen er udført i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt dette.

Dato: 14-10-2019


Lars H. Hudecek - Faglig Ansvarlig

Udført af:

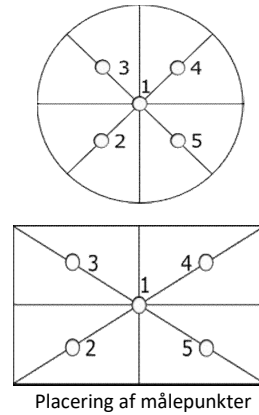

Ivan Sand - Automobilteknik



Måleresultater:

Ekcentrisk belastning

Position	Deling	1	2	3	4	5
	[g]	[g]	[g]	[g]	[g]	[g]
Visning	0,0001	49,9999	49,9999	50,0000	50,0000	49,9999
Fejl		0,0000	0,0000	0,0001	0,0001	0,0000
Største Fejl:		0,0001				



Repeterbarhed

Anvendt masse	Deling	Målt				
[g]	[g]	1	2	3	4	5
		[g]	[g]	[g]	[g]	[g]
100,0000	0,0001	99,9998	99,9998	99,9998	99,9998	99,9998
200,0000	0,0001	199,9996	199,9996	199,9996	199,9996	199,9996

Linearitet

Reference masse	Deling	Målt		I middel	Fejl	Udv. måle- usikkerhed	Dæknings faktor
		l1	l2				
[g]	[g]	[g]	[g]	[g]	[g]	[g]	
0,001000	0,0001	0,0010	0,0010	0,001000	0,000000	0,000064	2,00
0,050000	0,0001	0,0500	0,0500	0,050000	0,000000	0,000079	2,00
0,500000	0,0001	0,5000	0,5000	0,500000	0,000000	0,00012	2,00
5,000001	0,0001	5,0000	5,0000	5,000000	-0,00001	0,00022	2,00
20,00002	0,0001	20,0000	20,0000	20,000000	-0,00002	0,00036	2,00
50,00006	0,0001	49,9999	49,9999	49,999900	-0,00016	0,00052	2,00
100,00012	0,0001	99,9998	99,9998	99,999800	-0,00032	0,00093	2,00
150,0002	0,0001	149,9997	149,9997	149,999700	-0,0005	0,0014	2,00
220,0003	0,0001	219,9995	219,9995	219,999500	-0,0008	0,0022	2,00

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren k, som for en t-fordeling, med det relevante antal frihedsgrader, giver en dæknings sandsynlighed på ca. 95%

Omgivelser:

Temperatur	21,6 ± 1 °C
Luftfugtighed	43 ± 5 %RH
Lufttryk	1011 ± 5 hPa
Beregnet Luftdensitet	1,190 ± 0,012 kg/m3



KALIBRERINGSCERTIFIKAT - Revision 1

CERTIFIKATNR.:

200-L-21243 Rev 1

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Lufthastighedsmåler, Anemometer

Fabrikat:	Testo	Serienr.:	61503580
Kundemærke:	176529	Område:	0 - 0,7 m/s
Inddeling:	0,01 m/s	Type:	Varmetrådsanemometer
Udgangssignal:	m/s		
Tilbehør:	Displayenhed: Testo, id nr. 176529-Display, serie nr. 83010838		

Periode: Modtaget: 09-09-2019 Kalibreret: **12-09-2019**

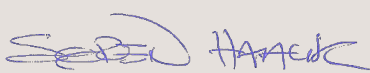
Procedure: D1-2

Bemærkninger: Erstatte certifikat nr. 200-L-21243 af 12.09.2019.
Udstedelsesårsag: Ændring af kunde ID

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

**Godkendt og
digitalt signeret
08-10-2019 af:**



Søren Haack
Konsulent



DANAK
CAL Reg.nr. 200

LUFTLABORATORIET
TEKNOLOGISK INSTITUT

Dato: 2019.09.12

Cert nr: 200-L-21243

Side: 2 af 4

KALIBRERINGS CERTIFIKAT
ANEMOMETER

Måleområde: 0 - 0,7 m/s

Luft temperatur °C	Luft massefylde kg/m ³	Reference hastighed m/s	Emnets visning m/s	Fejl m/s	Usikkerhed m/s
22,42	1,196	0,050	0,07	0,020	0,023
22,42	1,196	0,202	0,21	0,008	0,023
22,42	1,196	0,403	0,41	0,007	0,023
22,42	1,196	0,605	0,60	-0,005	0,023
22,42	1,196	0,706	0,69	-0,016	0,023
22,42	1,196	0,706	0,69	-0,016	0,023
22,42	1,196	0,605	0,60	-0,005	0,023
22,42	1,196	0,403	0,40	-0,003	0,023
22,42	1,196	0,202	0,21	0,008	0,023
22,52	1,196	0,050	0,07	0,020	0,023

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.12

Cert nr: 200-L-21243

Side: 3 af 4

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,4 ± 0,6
Relativ luftfugtighed (%) :	54 ± 10
Barometerstand (mbar) :	1020,1 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren $k = 2$, som for en normalfordeling svarer til en dækningsandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-04/2.

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

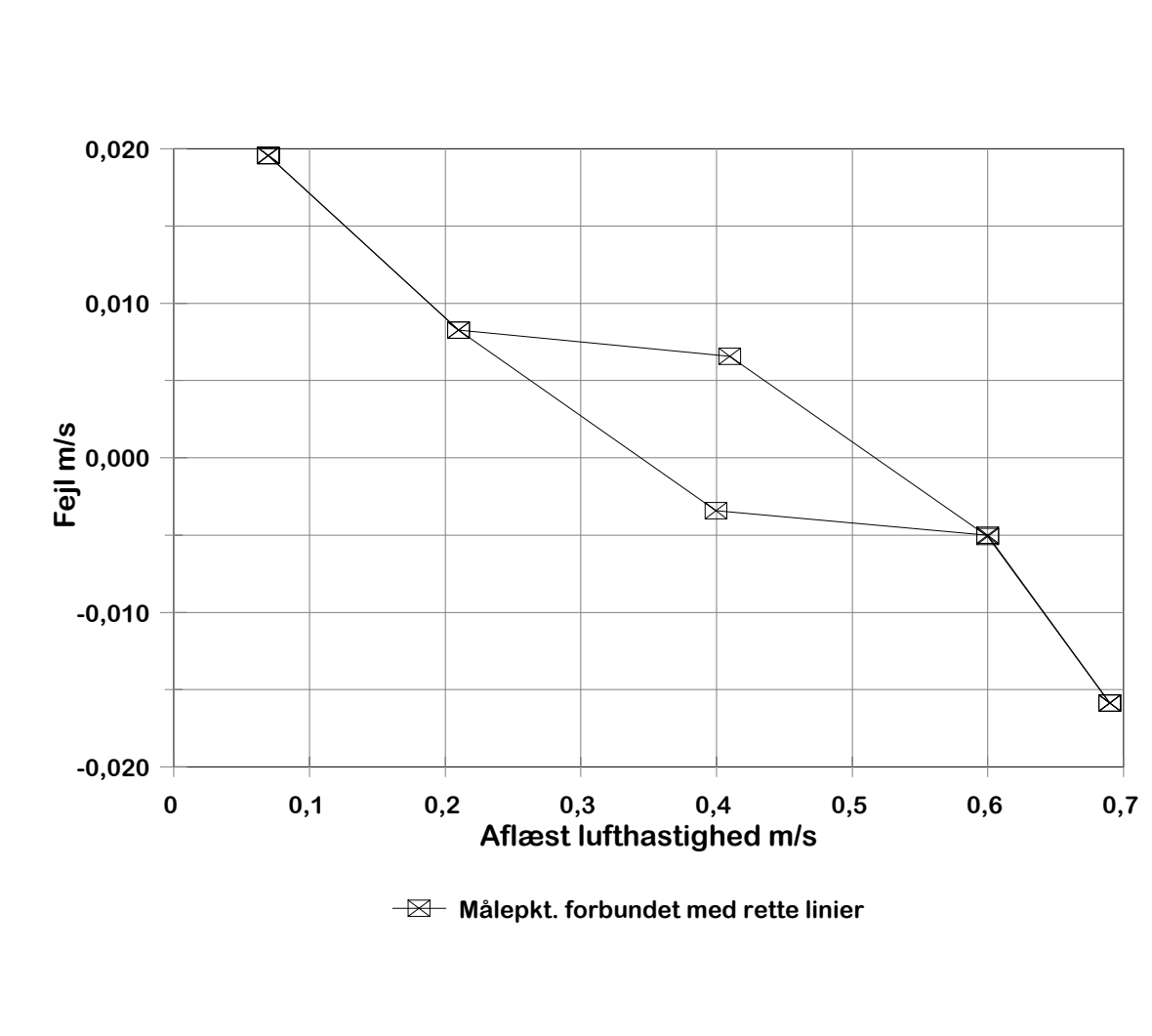
Dato : 2019.09.12

Cert nr 200-L-21243

Side : 4 af 4

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand hastighed = Aflæst - Fejl (med fortegn)

Usikkerhed: 0,023 m/s til 0,023 m/s



**TEKNOLOGISK
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Teknologiparken
Kongsvang Allé 29
Bygning 14
8000 Aarhus C
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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-24979

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Mikromanometer

Fabrikat:	TSI	Model:	8705-M-GB
Serienr.:	56050491	Kundemærke:	270-A-2406
Område:	-1245 - 3735 Pa	Inddeling:	0,1 Pa
Type:	DP-CALC		

Rekvissionsnr.: MXB

Periode: Modtaget: 03-09-2019 Kalibreret: **05-09-2019**

Procedure: D1-3.2

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Javier I. Camacho, 72 20 25 92, jcam@teknologisk.dk

**Godkendt og
digitalt signeret
05-09-2019 af:**

Kenn Øholm
Konsulent, tekniker



DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24979

Side 2 af 4

KALIBRERINGSCERTIFIKAT

Målinger

Måleområde: -1245 - 3735 Pa

Reference Op 1 Pa	Aflæsning Pa	Reference Ned 1 Pa	Aflæsning Pa	Reference Op 2 Pa	Aflæsning Pa	Reference Ned 2 Pa	Aflæsning Pa
0,00	0,0	0,00	-0,1	0,00	0,0	0,00	-0,1
2,01	2,0	2,04	1,9	1,97	1,9	2,01	1,9
9,99	10,0	10,00	9,9	9,97	10,0	9,96	9,9
19,68	19,7	20,27	20,4	19,81	19,9	20,28	20,4
29,78	29,9	30,31	30,5	29,75	29,9	30,26	30,4
99,72	100,4	100,17	101,1	99,72	100,5	100,20	101,1
199,75	201,5	200,03	201,8	199,81	201,5	199,97	202,0
300,27	302,7	300,29	303,2	300,29	302,9	300,20	303,0

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24979

Side 3 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Måleområde: -1245 - 3735 Pa

Reference middelværdi Pa	Aflæsning middelværdi Pa	Opløsning Pa	Hysteresese Pa	Fejl Pa	Usikkerhed Pa
0,00	-0,05	0,1	0,07	-0,05	0,11
2,01	1,93	0,1	0,06	-0,08	0,10
9,98	9,95	0,1	0,11	-0,03	0,14
20,01	20,09	0,1	0,03	0,07	0,09
30,03	30,17	0,1	0,02	0,14	0,09
99,95	100,79	0,1	0,17	0,84	0,22
199,89	201,71	0,1	0,17	1,81	0,23
300,26	302,96	0,1	0,31	2,69	0,35

Maks. hysteresese: 0,310 Pa
Maks. fejl: 2,690 Pa
Maks. relativ fejl
i forhold til måleområdet: 0,054 %

TRYKLABORATORIET

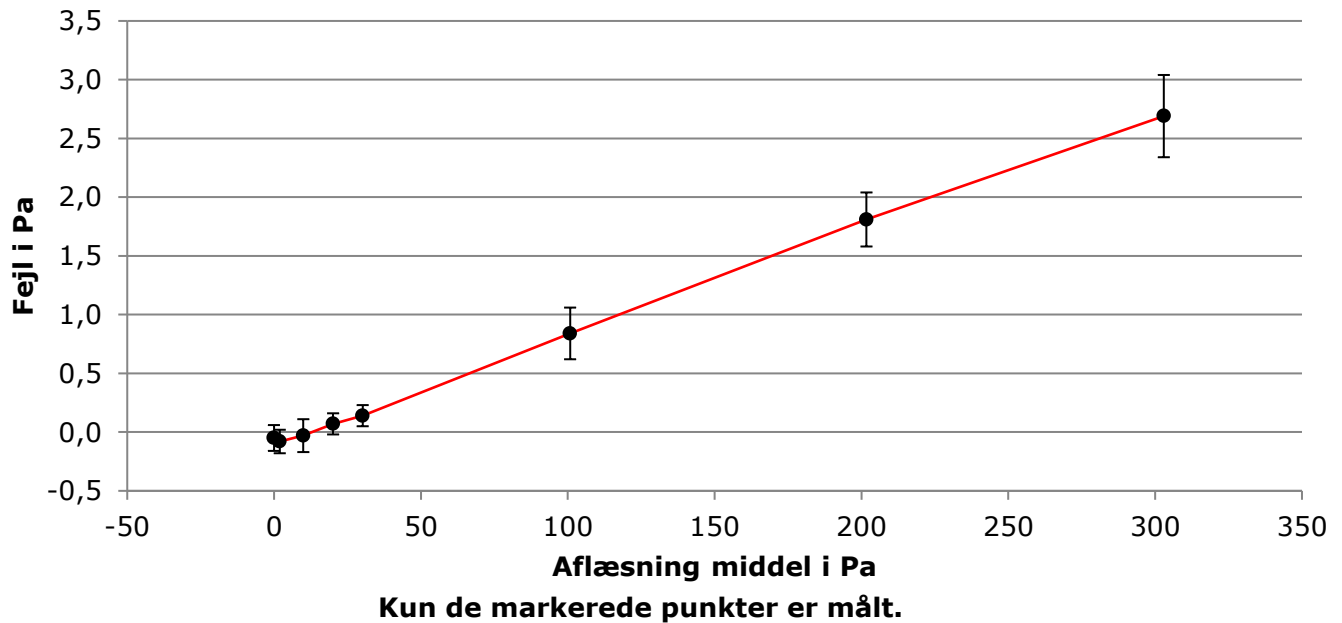
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24979

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve



Bemærkninger:

Alle værdier under 'Op' og 'Ned' er afrundede middelværdier af 10 målinger (rådata). Værdierne under 'Fejl' er ligeledes afrundede middelværdier af samme rådata (evt. 2 gange, dvs. 20 eller 40 målinger). Der kan derfor forekomme uoverensstemmelse mellem måleresultater og fejl, da alle tal afrundes til 2 betydende cifre, jf. EA4/02.

Fejl = aflæsningsværdi - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20,3 °C ± 0,4 °C
Relativ fugtighed:	62,7 %rh ± 6,6 %rh
Barometerstand:	1005,3 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



**TEKNOLOGISK
INSTITUT**

Teknologiparken
Kongsvang Allé 29
Bygning 14
8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-U-23314

Side 1 af 5
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Relativ fugtmåler, Luft fugtighed og Rum temperatur i ELAB

Fabrikat:	Thermoguard	Model:	57713
Serienr.:	OK + 02457265	Kundemærke:	142357
Område:	0 - 100 %RH / -40 - +80 °C	Inddeling:	0,1 %RH / 0,1 °C
Tilbehør:	Føler S/N: OK+02427057		

Rekvissionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **19-09-2019**

Procedure: D1-6.1

Bemærkninger: Aflæsning er foretaget vha. software.
Kalibrering er foretaget i to-trykgenerator.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Mette Pedersen, 72 20 12 32, mo@teknologisk.dk

**Godkendt og
digitalt signeret
19-09-2019 af:**

Peter Friis Østergaard
Seniorspecialist, PhD



DANAK
CAL Reg.nr. 200

FUGTLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-U-23314

Side 2 af 5

KALIBRERINGS CERTIFIKAT
Resultater

Reference- værdi °C	Reference- værdi %rh	Aflæsning %rh	Fejl %rh	Usikkerhed %rh	Note
18,02	45,06	46,60	1,54	0,37	
22,02	15,12	18,40	3,28	0,17	
22,05	45,23	45,80	0,57	0,36	
22,07	80,37	78,30	-2,07	0,59	
28,18	45,43	46,25	0,82	0,36	

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET

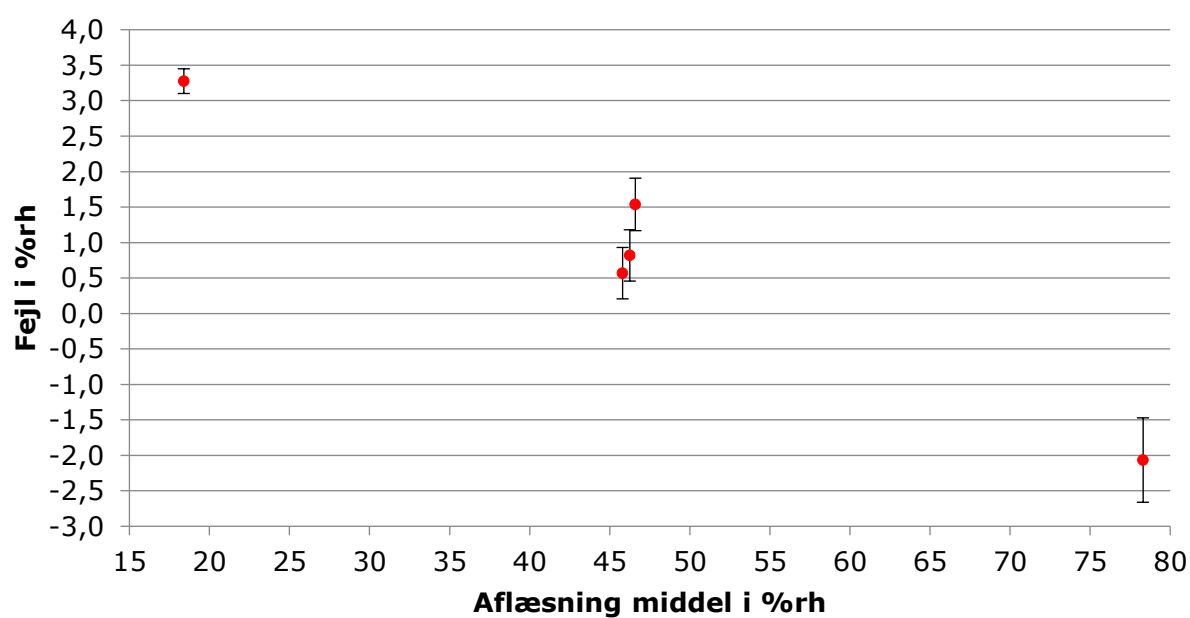
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-U-23314

Side 3 af 5

KALIBRERINGS CERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-U-23314

Side 4 af 5

KALIBRERINGS CERTIFIKAT
Resultater

Reference- værdi °C	Aflæsning værdi °C	Fejl °C	Usikkerhed °C	Note
18,016	17,90	-0,116	0,089	
22,054	21,95	-0,104	0,088	
28,178	28,10	-0,078	0,088	

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET

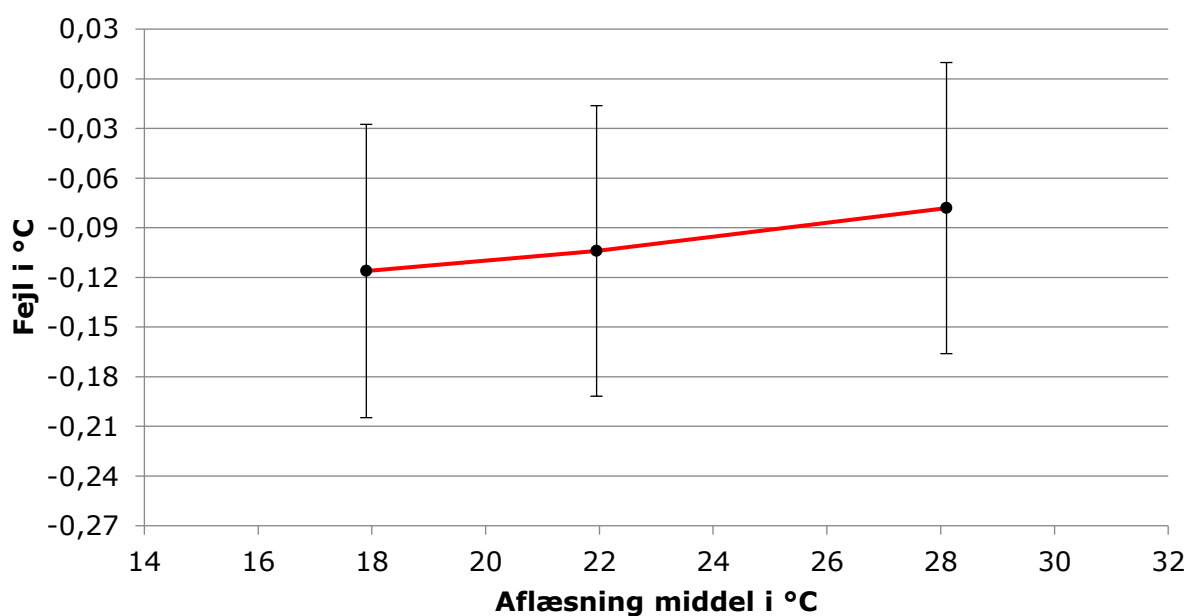
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-U-23314

Side 5 af 5

KALIBRERINGS CERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k = 2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Rumtemperatur: $22\text{ °C} \pm 3\text{ °C}$

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



**TEKNOLOGISK
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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-24829

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Pressometri
Kenn Øholm
Kongsvang Allé 29
8000 Århus C

Emne: Barometer

Fabrikat:	Ahlborn	Model:	Almemo FD A612-SA
Serienr.:	08120625	Kundemærke:	270-A-2617
Område:	700 - 1050 mbar abs	Inddeling:	0,1 mbar abs
Tilbehør:	Displayenhed: Ahlborn, Almemo 2490, Kundemærke: 270-A-2618.		

Periode: Modtaget: 21-03-2019 Kalibreret: **09-04-2019**

Procedure: D1-6.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og
digitalt signeret
09-04-2019 af:

Mette Pedersen
Kvalitets & måletekniker



DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24829

Side 2 af 4

KALIBRERINGSCERTIFIKAT

Målinger

Måleområde: 700 - 1050 mbar a

Reference Op 1 mbar a	Aflæsning mbar a	Reference Ned 1 mbar a	Aflæsning mbar a	Reference Op 2 mbar a	Aflæsning mbar a	Reference Ned 2 mbar a	Aflæsning mbar a
949,982	950,2	949,982	950,2	949,982	950,2	949,982	950,2
969,983	970,2	969,983	970,2	969,983	970,2	969,983	970,2
989,984	990,1	989,984	990,1	989,984	990,1	989,984	990,1
1.009,985	1.010,0	1.009,985	1.010,0	1.009,985	1.010,0	1.009,985	1.010,0
1.029,986	1.029,9	1.029,986	1.029,9	1.029,986	1.029,9	1.029,986	1.029,9
1.049,987	1.049,6	1.049,987	1.049,6	1.049,987	1.049,6	1.049,987	1.049,6

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24829

Side 3 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Måleområde: 700 - 1050 mbar a

Reference middelværdi mbar a	Aflæsning middelværdi mbar a	Opløsning mbar a	Hysteresese mbar a	Fejl mbar a	Usikkerhed mbar a
949,982	950,200	0,1	0,000	0,218	0,096
969,983	970,200	0,1	0,000	0,217	0,096
989,984	990,100	0,1	0,000	0,116	0,097
1.009,985	1.010,000	0,1	0,000	0,015	0,097
1.029,986	1.029,900	0,1	0,000	-0,086	0,097
1.049,987	1.049,600	0,1	0,000	-0,387	0,098

Maks. hysteresese: 0,000 mbar a
Maks. fejl: -0,387 mbar a
Maks. relativ fejl
i forhold til måleområdet: 0,11 %

TRYKLABORATORIET

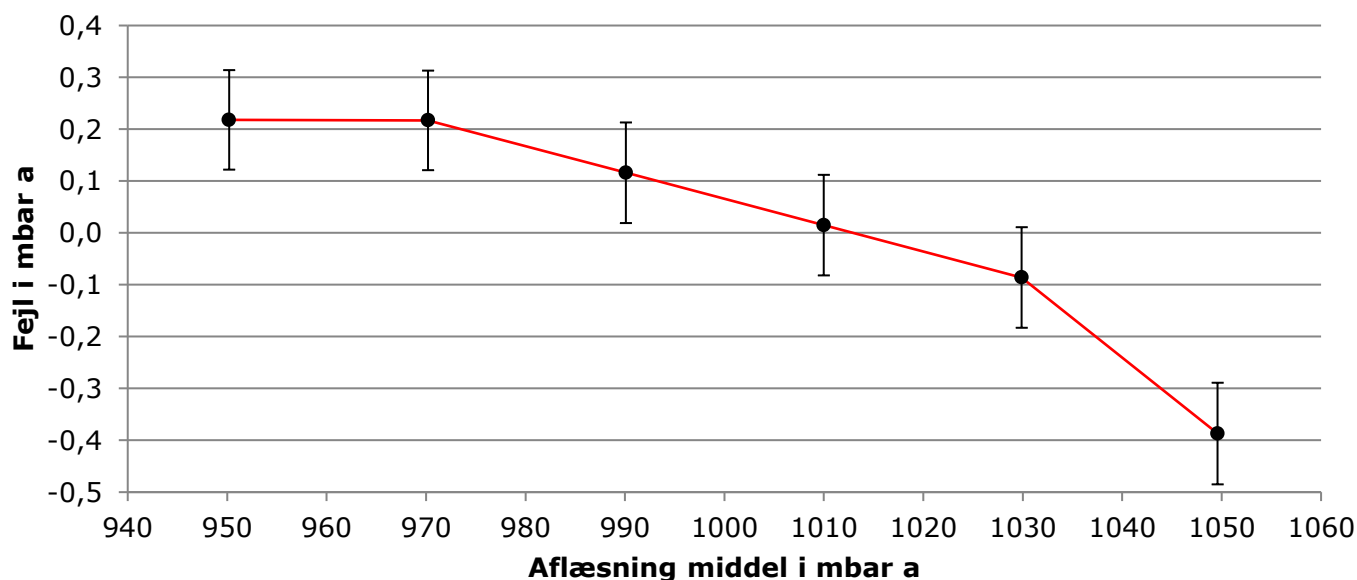
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24829

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	$20,5\text{ °C} \pm 0,3\text{ °C}$
Relativ fugtighed:	$44,4\text{ \%rh} \pm 4,4\text{ \%rh}$
Barometerstand:	$1019,7\text{ mbar} \pm 2,0\text{ mbar}$

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



Kalibreringscertifikat

Task nr.: 119-28038
Certifikat nr.: 9.8-21127
Side: 1 af 3

OBJEKT:

Prøveemne: Masseflowmåler
Fabrikat: Red-y
Id nr. Hel
Serie nr.: 198703
Størrelse: 10 nl/min N2

REKVIRENT:

Teknologisk Institut
Kongsvang Allé 29
8000 Århus C
Att.: Max Bjerrum

SKALA//SKALAINDELING: 0 - 10 nl/min // 0,1 nl/min

PRØVNINGSBETINGELSER:

Prøvningsmetode/medie: Gennemstrømning med nitrogen.
Middelbarometerstand: 1006 mbar
Omgivelsestemperatur: 20 ± 1 °C

PRØVNINGSOMFANG:

Kalibrering ved : 2,5; 5,0; 7,5 og 10 nl/min
Resultater opgives i nl/min
(1 nl/min = 1 l/min ved 0 °C, og 1013,25 mbar.)

KALIBRERING iht.:

FORCE instruktion nr. 60.2.02.

KALIBRERINGSDATO:

2019-09-17

KALIBRERINGSRESULTAT:

Resultater, se side 2.

SPORBARHED:

Prøveanlæg: FORCE nr.: C02-006 Se side 3.

BEMÆRKNINGER:

Teknisk vurdering: Ingen bemærkninger.

UDSTEDELSESDATO:

2019-10-01


Preben Bendt Toftdahl Jensen
Opgaveansvarlig


Flemming Grud Madsen
Underskriftsberettiget

Task nr.: 119-28038
 Certifikat nr.: 9.8-21127
 Side: 2 af 3



OBJEKT:

Prøveemne: Masseflowmåler
 Fabrikat: Red-y
 Id nr. Hel
 Serie nr.: 198703
 Størrelse: 10 nl/min N2

Qmax: 10 nl/min
 Qmin: 0 nl/min
 Scale division: 0,1 nl/min

Referenceværdier

Udstyr under kalibrering

Sandt flow nl/min	Ucmc ±nl/min	Vist flow nl/min	Standard- usikkerhed nl/min	Fejl Relativ %	Ekspanderet usikkerhed ±%	Dæknings- faktor (k)	Tryk mbara	Tempera- tur °C
10,027	0,017	10,00	0,03	-0,27	0,50	1,65	1009,4	20,4
7,485	0,013	7,50	0,03	0,20	0,65	1,65	1009,2	20,4
4,952	0,008	5,00	0,03	0,98	0,97	1,65	1009,1	20,4
2,4883	0,0042	2,50	0,03	0,47	1,92	1,65	1009,1	20,4

"Ucmc" er 0,17% af "Sandt flow".

"Vist flow" er middelværdi af visninger aflæst i målerens display. Antallet af aflæsninger var 11.

I "Standardusikkerhed" er et bidrag fra standardafvigelsen knyttet til "Vist flow" samt et bidrag fra aflæsningernes afrundingsfejl. Standardafvigelsen var nul i alle flowpunkter.

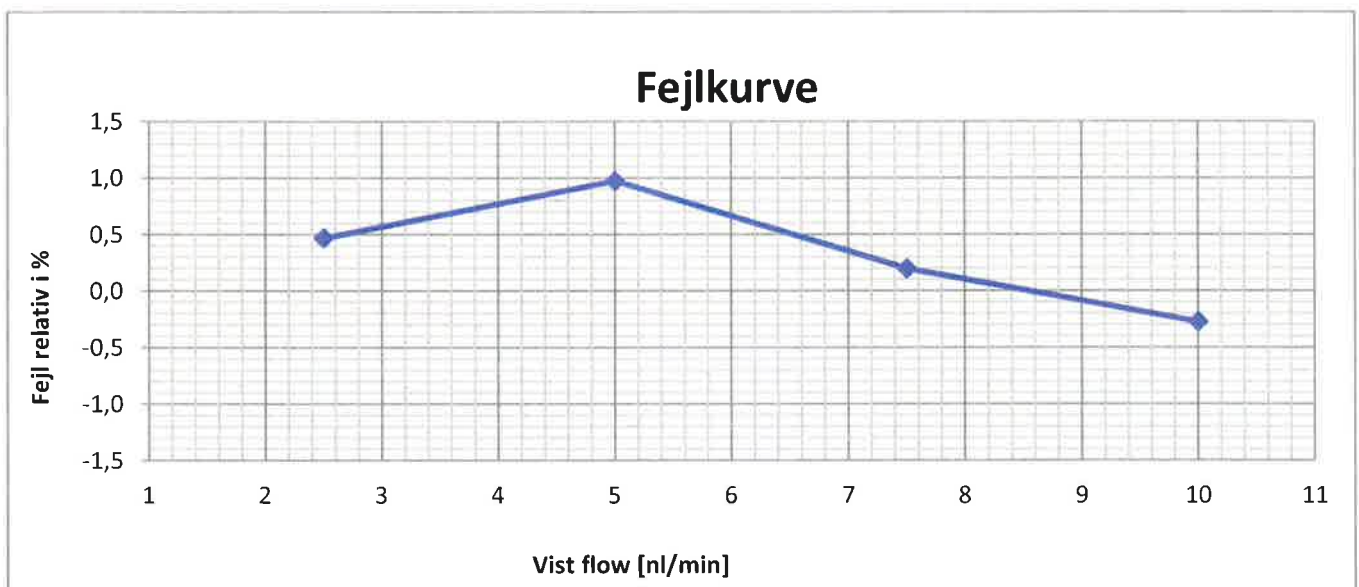
"Fejl relativ" blev beregnet med formlen: ("Vist flow" - "Sandt flow")/"Sandt flow"x100.

Summen af bidrag i måleusikkerhed fra måleevnen "Ucmc" og fra standardafvigelsen knyttet til "Vist flow" divideret med bidraget fra afrundingsfejlen i aflæsningerne er 0,3 eller mindre. Det viser at "Fejl Relativ" er omtrent firkantfordelt. Dækningsfaktoren er derfor 1,65.

"Ekspanderet usikkerhed" blev beregnet med formlen:

$$\frac{k}{\text{"Sandt flow"}} \times \sqrt{\left(\frac{\text{"Ucmc"}}{2}\right)^2 + \text{"Standardusikkerhed"}^2} \times 100$$

"Temperatur" og "Tryk" blev målt efter måler.



Målepunkter er forbundet med rette linier

Task nr.: 119-28038
Certifikat nr.: 9.8-21127
Side: 3 af 3

LABORATORIETS KONTROLUDSTYR

De med x mærkede arbejdsnormaler er anvendt til kalibreringen.

Arbejdsnormaler: FORCE nr: Sporbarhed:

Anlæg: FORCE nr. C02-006.

	Small tube 1-750 ml/min	A00-070	Trescal
	Medium tube 1-10000 ml/min	A00-069	Trescal
x	Big tube 1-50000 ml/min	A00-068	Trescal

Øvrigt udstyr:

x	Temperaturmålere	A70xxx	kalibreres i.h.t. instruktioner
x	Trykmålere	A80xxx	kalibreres i.h.t. instruktioner

Laboratoriets måleevne:

I beregningen af måleevnen U_{cmc} er medtaget alle betydende bidrag bortset fra målerens standardafvigelse og afrundingsfejl, som medtages i beregningen af den rapporterede ekspanderede usikkerhed.

Måleevnen U_{cmc} er: $\pm 0,17\%$ relativ.

Ekspanderet usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k , således at dæknings sandsynlighed svarer til ca. 95 %.

* VSL, Holland via FORCE Technology's nationale referencelaboratorium i Vejen.

End of certificate.



Kalibreringscertifikat

Task nr.: 119-28038
Certifikat nr.: 9.8-21126
Side: 1 af 3

OBJEKT:

Prøveemne: Masseflowmåler
Fabrikat: Red-y
Id nr. 144239 / Delt
Serie nr.: 198691
Størrelse: 10 nl/min N2

REKVIRENT:

Teknologisk Institut
Kongsvang Allé 29
8000 Århus C
Att.: Max Bjerrum

SKALA//SKALAINDELING: 0 - 10 nl/min // 0,1 nl/min

PRØVNINGSBETINGELSER:

Prøvningsmetode/medie: Gennemstrømning med nitrogen.
Middelbarometerstand: 1005 mbar
Omgivelsestemperatur: 20 ± 1 °C

PRØVNINGSOMFANG:

Kalibrering ved : 2,5; 5,0; 7,5 og 10 nl/min
Resultater opgives i nl/min
(1 nl/min = 1 l/min ved 0 °C, og 1013,25 mbar.)

KALIBRERING iht.:

FORCE instruktion nr. 60.2.02.

KALIBRERINGSDATO:

2019-03-17

KALIBRERINGSRESULTAT:

Resultater, se side 2.

SPORBARHED:

Prøveanlæg: FORCE nr.: C02-006 Se side 3.

BEMÆRKNINGER:

Teknisk vurdering: Ingen bemærkninger.

UDSTEDELSESDATO:

2019-10-01


Preben Bendt Toftdahl Jensen
Opgaveansvarlig


Flemming Grud Madsen
Underskriftsberettiget

Task nr.: 119-28038
 Certifikat nr.: 9.8-21126
 Side: 2 af 3



OBJEKT:

Prøveemne: Masseflowmåler
 Fabrikat: Red-y
 Id nr. 144239 / Delt
 Serie nr.: 198691
 Størrelse: 10 nl/min N2

Qmax: 10 nl/min
 Qmin: 0 nl/min
 Scale division: 0,1 nl/min

Referenceværdier

Udstyr under kalibrering

Sandt flow nl/min	Ucmc ±nl/min	Vist flow nl/min	Standard- usikkerhed nl/min	Fejl Relativ %	Ekspanderet usikkerhed ±%	Dæknings- faktor (k)	Tryk mbara	Tempera- tur °C
10,003	0,017	10,00	0,03	-0,03	0,50	1,65	1009,4	20,3
7,465	0,013	7,50	0,03	0,47	0,65	1,65	1009,2	20,3
4,9899	0,0085	5,00	0,03	0,20	0,96	1,65	1009,0	20,3
2,4891	0,0042	2,50	0,03	0,44	1,92	1,65	1008,9	20,3

"Ucmc" er 0,17% af "Sandt flow".

"Vist flow" er middelværdi af visninger aflæst i målerens display. Antallet af aflæsninger var 11.

I "Standardusikkerhed" er et bidrag fra standardafvigelsen knyttet til "Vist flow" samt et bidrag fra aflæsningernes afrundingsfejl. Standardafvigelsen var nul i alle flowpunkter.

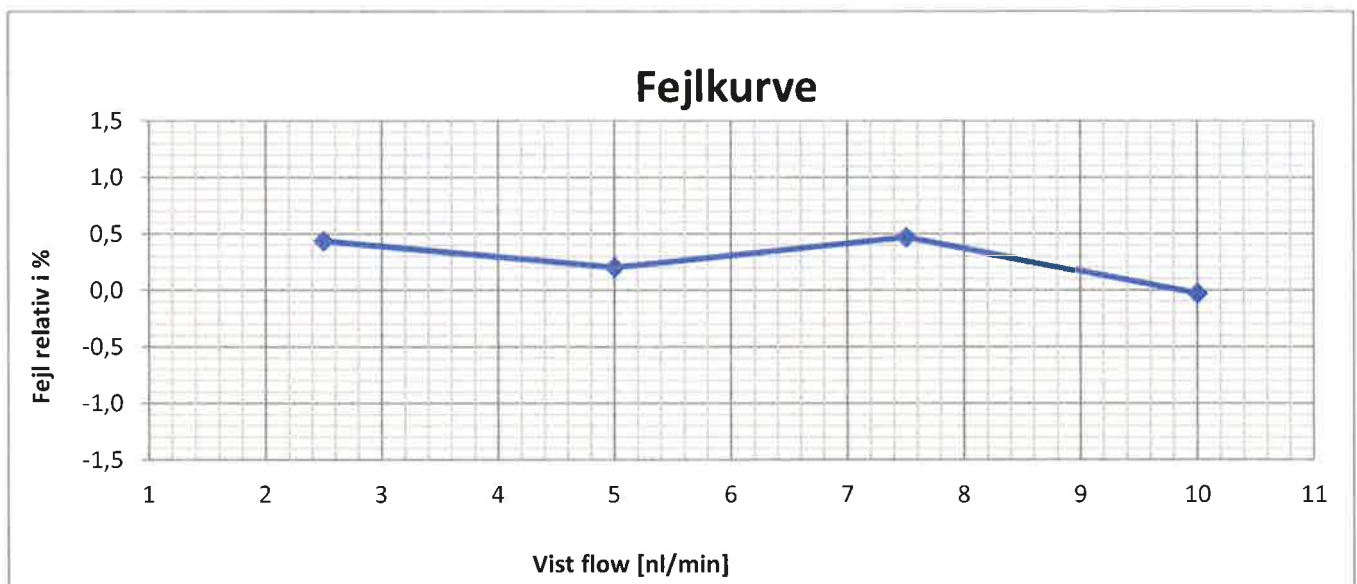
"Fejl relativ" blev beregnet med formlen: ("Vist flow" - "Sandt flow")/"Sandt flow"x100.

Summen af bidrag i måleusikkerhed fra måleevnen "Ucmc" og fra standardafvigelsen knyttet til "Vist flow" divideret med bidraget fra afrundingsfejlen i aflæsningerne er 0,3 eller mindre. Det viser at "Fejl Relativ" er omtrent firkantfordelt. Dækningsfaktoren er derfor 1,65.

"Ekspanderet usikkerhed" blev beregnet med formlen:

$$\frac{k}{\text{"Sandt flow"}} \times \sqrt{\left(\frac{\text{"Ucmc"}}{2}\right)^2 + \text{"Standardusikkerhed"}^2} \times 100$$

"Temperatur" og "Tryk" blev målt efter måler.



Målepunkter er forbundet med rette linier

Task nr.: 119-28038
Certifikat nr.: 9.8-21126
Side: 3 af 3

LABORATORIETS KONTROLUDSTYR

De med x mærkede arbejdsnormaler er anvendt til kalibreringen.

Arbejdsnormaler: FORCE nr: Sporbarhed:

Anlæg: FORCE nr. C02-006.

	Small tube 1-750 ml/min	A00-070	Trescal
	Medium tube 1-10000 ml/min	A00-069	Trescal
x	Big tube 1-50000 ml/min	A00-068	Trescal

Øvrigt udstyr:

x	Temperaturmålere	A70xxx	kalibreres i.h.t. instruktioner
x	Trykmålere	A80xxx	kalibreres i.h.t. instruktioner

Laboratoriets måleevne:

I beregningen af måleevnen U_{cmc} er medtaget alle betydende bidrag bortset fra målerens standardafvigelse og afrundingsfejl, som medtages i beregningen af den rapporterede ekspanderede usikkerhed.

Måleevnen U_{cmc} er: $\pm 0,17\%$ relativ.

Ekspanderet usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k , således at dæknings sandsynlighed svarer til ca. 95 %.

* VSL, Holland via FORCE Technology's nationale referencelaboratorium i Vejen.

End of certificate.

Kontrol af flowmåler for Rumblank.

Dato: 23-09-2019
Id nr.: 144257

Int.: MXB
Cert nr.: ELAB-39-2019

Ref.: Id nr. 144239 (Delt)
T_rum: **24**

Flowmeter Rumblank l/m	Ref. Delt. nl/m	Faktor	Ref. d.d. 24 °C l/m	Korrektion
6	5,2	1,0879	5,7	-0,3
7	6,1		6,6	-0,4
8	7,1		7,7	-0,3

Korrigeres efter certifikat.

**TEKNOLOGISK
INSTITUT**

Teknologiparken
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Bygning 14
8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-T-22943

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Termometer, Modstandstermometer

Fabrikat:	Kamstrup A/S	Model:	81 41221101002100085
Serienr.:	-	Kundemærke:	270-A-1629 BUND KANAL
Område:	0 - 100 °C	Type:	Pt-100 med FlexTop transmitter
Udgangssignal:	4 - 20 mA	Diameter:	8 mm.

Rekvissionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **20-09-2019**

Procedure: D1-2.2

Bemærkninger: Kalibreringen er foretaget i væskebade ved sammenligning med referenceføler. Føleren er neddyppet til og med forskruningens gevindstykke. Kalibreret i området 20 – 95° celsius.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Bjørn Kjærsgaard Nielsen, 72203534, bjni@teknologisk.dk

**Godkendt og
digitalt signeret
30-09-2019 af:**

Søren Lindholt Andersen
Konsulent, Ph.d.



DANAK
CAL Reg.nr. 200

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-T-22943

Side 2 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Føler mærket: 270-A-1629 BUND KANAL

4 - 20 mA ~ 0 - 100 °C

Reference- værdi °C	Reference- værdi mA	Aflæsning mA	Fejl mA	Usikkerhed mA	Note
19,9986	7,1998	7,2163	0,0166	0,0039	
44,9953	11,1992	11,2366	0,0374	0,0048	
65,0061	14,4010	14,4363	0,0353	0,0053	
94,9924	19,1988	19,2199	0,0212	0,0064	

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Aflæsning - referenceværdi.

TEMPERATURLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-T-22943

Side 3 af 4

KALIBRERINGSCERTIFIKAT
Resultater

Føler mærket: 270-A-1629 BUND KANAL

4 - 20 mA ~ 0 - 100 °C

Reference- værdi °C	Aflæsning mA	Beregnet °C	Fejl °C	Usikkerhed °C	Note
19,999	7,216	20,102	0,103	0,025	
44,995	11,237	45,229	0,234	0,030	
65,006	14,436	65,227	0,221	0,033	
94,992	19,220	95,125	0,132	0,040	

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Beregnet - referenceværdi.

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

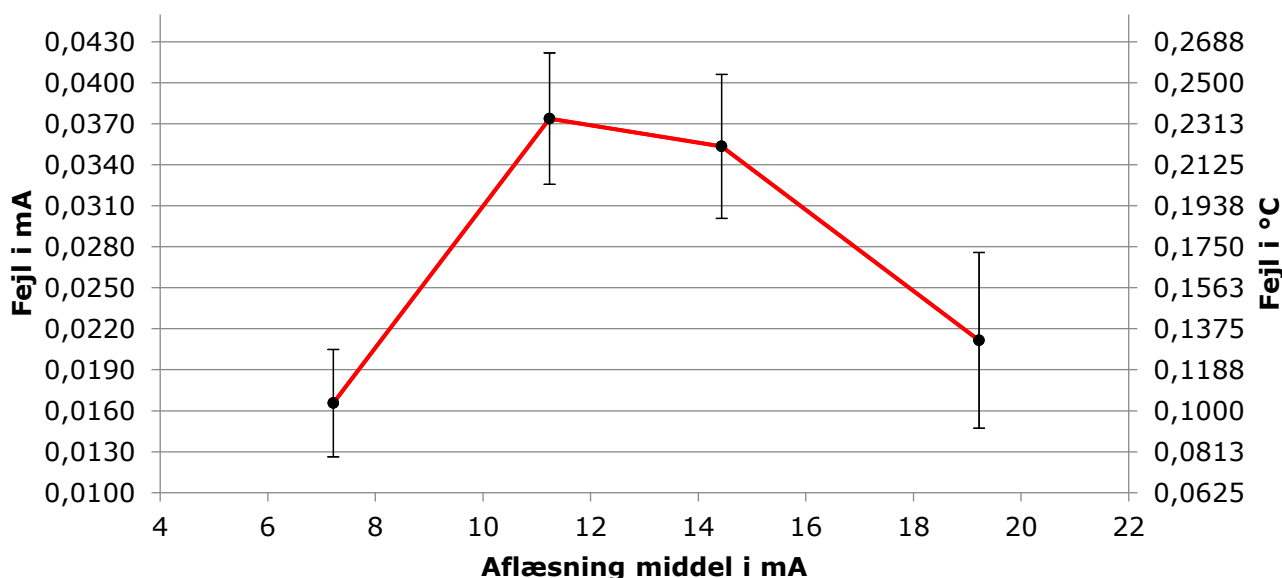
Certifikat nr.: 200-T-22943

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve

Føler mærket: 270-A-1629 BUND KANAL



Kun de markerede punkter er målt.

Bemærkninger:

Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Alle temperaturer er i henhold til ITS90

Kalibreringsforhold:

Rumtemperatur: $22,7 \text{ °C} \pm 1,4 \text{ °C}$
Relativ fugtighed: $40,2 \text{ \%rh} \pm 9,3 \text{ \%rh}$
Barometerstand: $1022,9 \text{ mbar} \pm 5,1 \text{ mbar}$

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



**TEKNOLOGISK
INSTITUT**

Teknologiparken
Kongsvang Allé 29
Bygning 14
8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-L-21246

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**
Fabrikat: Brooks Serienr.: **P20438;
0112030/489315001;
B2110016701**
Kundemærke: **Id nr. 83013** Område: 0 - 21 m³/h
Udgangssignal: Skala

Rekvisitionsnr.: MXB

Periode: Modtaget: 23-09-2019 Kalibreret: **23-09-2019**

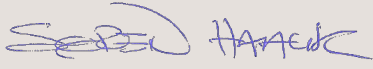
Procedure: D2-1

Bemærkninger: Rør nr. 1: 0,09 - 0,9 m³/h
Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar
Måleren er aflæst midt på kugle.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

**Godkendt og
digitalt signeret
24-09-2019 af:**


Søren Haack
Konsulent



DANAK
CAL Reg.nr. 200

LUFTLABORATORIET
TEKNOLOGISK INSTITUT

Cert. nr.: 200-L-21246

Side: 2 af 4

KALIBRERINGS CERTIFIKAT
LUFTFLOWMÅLER

Måleområde: 0,09 - 0,9 m³/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m ³ /h	Reference flow m ³ n/h	Emnets visning m ³ n/h	Fejl m ³ n/h	Usikkerhed m ³ n/h
22,62	1603,90	0,07	0,11	0,12	0,01	0,01
22,62	1584,70	0,15	0,24	0,24	0,00	0,01
22,62	1567,60	0,25	0,38	0,38	-0,00	0,01
22,62	1548,90	0,40	0,60	0,58	-0,02	0,02
22,62	1523,70	0,53	0,79	0,76	-0,03	0,02
22,62	1509,60	0,64	0,94	0,90	-0,04	0,02
22,62	1511,90	0,64	0,94	0,90	-0,04	0,02
22,62	1528,30	0,53	0,79	0,76	-0,03	0,02
22,62	1547,30	0,39	0,59	0,58	-0,01	0,02
22,62	1570,50	0,25	0,38	0,38	-0,00	0,01
22,62	1586,70	0,15	0,24	0,24	0,00	0,01
22,62	1605,90	0,07	0,11	0,12	0,01	0,01

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.23

Cert. nr: 200-L-21246

Side: 3 af 4

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,6 ± 0,6
Relativ luftfugtighed (%) :	52 ± 10
Barometerstand (mbar) :	1015,3 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren $k = 2$, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

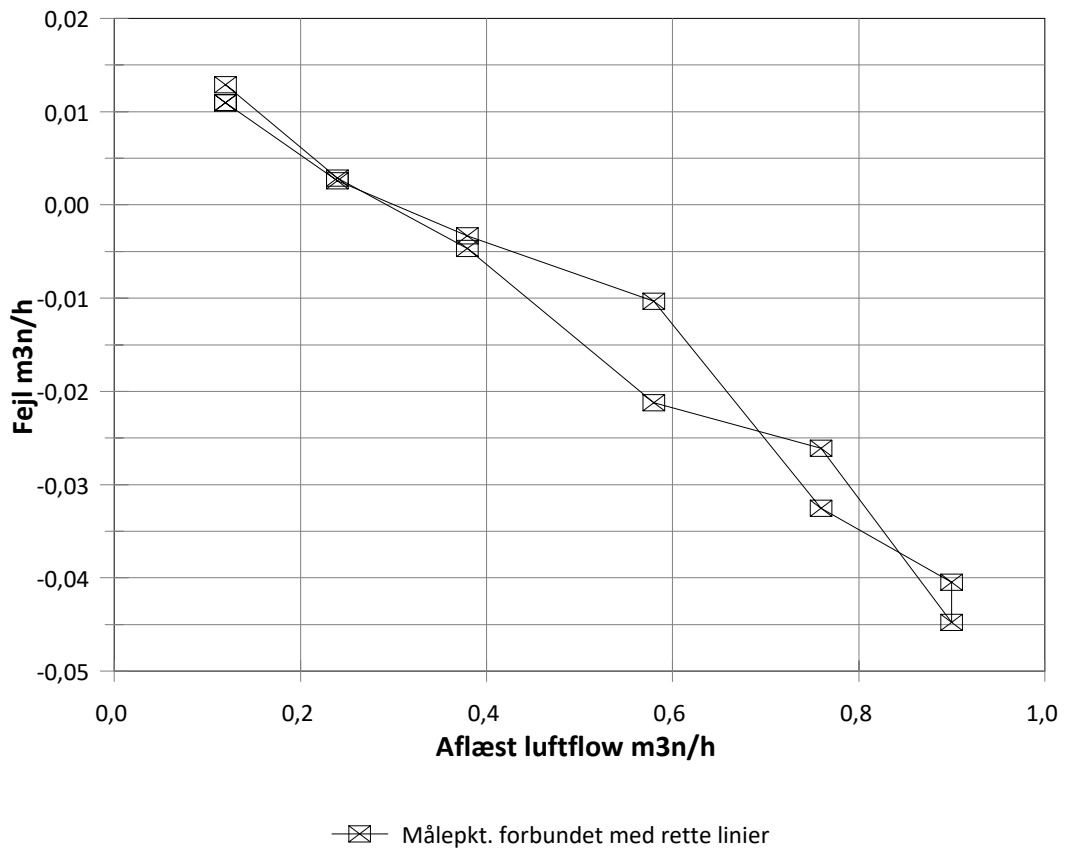
Dato: 2019.09.23

Cert. nr.: 200-L-21246

Side : 4 af 4

KALIBRERINGS CERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,01 m³n/h til

0,02 m³n/h

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Kongsvang Allé 29
Bygning 14
8000 Aarhus C
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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-L-21247

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**
Fabrikat: Brooks Serienr.: **P20438;
0112030/489315001;
B2110016701**
Kundemærke: **Id nr. 83013** Område: 0 - 21 m³/h
Udgangssignal: Skala

Rekvisitionsnr.: MXB

Periode: Modtaget: 23-09-2019 Kalibreret: **23-09-2019**

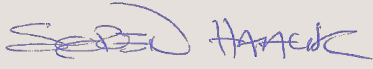
Procedure: D2-1

Bemærkninger: Rør nr. 2: 0,5 - 5 m³/h
Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

**Godkendt og
digitalt signeret
24-09-2019 af:**


Søren Haack
Konsulent



DANAK
CAL Reg.nr. 200

LUFTLABORATORIET
TEKNOLOGISK INSTITUT

Cert. nr.: 200-L-21247

Side: 2 af 4

KALIBRERINGS CERTIFIKAT
LUFTFLOWMÅLER

Måleområde: 0,5 - 5 m³/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m ³ /h	Reference flow m ³ n/h	Emnets visning m ³ n/h	Fejl m ³ n/h	Usikkerhed m ³ n/h
22,42	1560,80	0,63	0,97	0,80	-0,17	0,09
22,42	1547,60	0,71	1,08	1,00	-0,08	0,09
26,06	1502,90	1,09	1,58	1,50	-0,08	0,09
22,62	1851,20	1,37	2,48	2,50	0,02	0,08
22,62	1785,50	2,05	3,59	3,50	-0,09	0,09
22,62	1728,20	2,64	4,46	4,25	-0,21	0,11
22,62	1678,40	3,17	5,21	5,00	-0,21	0,12
22,62	1678,40	3,16	5,19	5,00	-0,19	0,12
22,62	1704,50	2,68	4,46	4,25	-0,21	0,11
22,62	1808,30	2,00	3,54	3,50	-0,04	0,09
22,62	1878,80	1,36	2,49	2,50	0,01	0,08
22,42	1504,00	1,08	1,59	1,50	-0,09	0,09
22,42	1551,50	0,71	1,07	1,00	-0,07	0,09
22,42	1561,40	0,61	0,94	0,80	-0,14	0,09

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.23

Cert. nr: 200-L-21247

Side: 3 af 4

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,5 ± 0,6
Relativ luftfugtighed (%) :	51 ± 10
Barometerstand (mbar) :	1015,5 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren $k = 2$, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato:

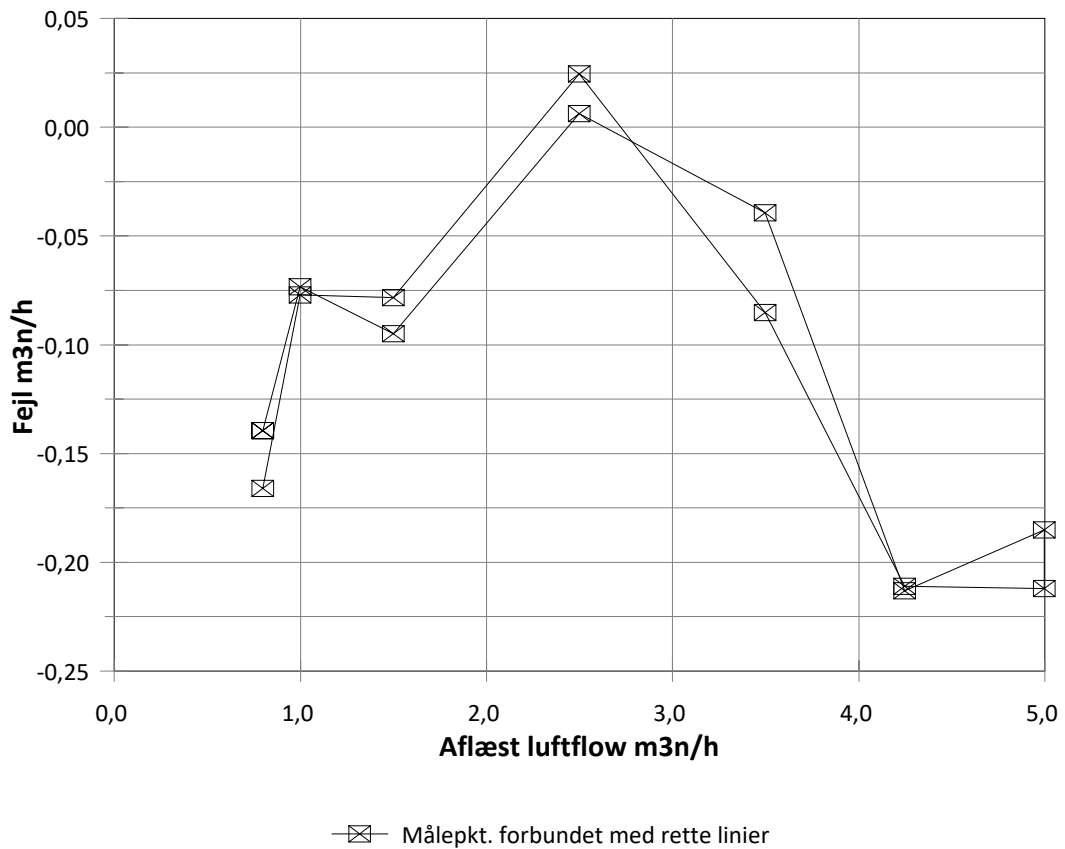
2019.09.23

Cert. nr.: 200-L-21247

Side : 4 af 4

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,08 m³n/h til

0,12 m³n/h

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Teknologiparken
Kongsvang Allé 29
Bygning 14
8000 Aarhus C
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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-L-21244

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**
Fabrikat: Brooks Serienr.: **P20438;
0112030/489315001;
B2110016701**
Kundemærke: **Id nr. 83013** Område: 0 - 21 m³/h
Udgangssignal: Skala

Rekvisitionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **23-09-2019**

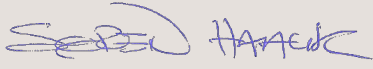
Procedure: D2-1

Bemærkninger: Rør nr. 3: 2,7 - 21 m³/h Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

**Godkendt og
digitalt signeret
24-09-2019 af:**


Søren Haack
Konsulent



DANAK
CAL Reg.nr. 200

LUFTLABORATORIET
TEKNOLOGISK INSTITUT

Cert. nr.: 200-L-21244

Side: 2 af 4

KALIBRERINGS CERTIFIKAT
LUFTFLOWMÅLER

Måleområde: 2,7 - 21 m³/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m ³ /h	Reference flow m ³ n/h	Emnets visning m ³ n/h	Fejl m ³ n/h	Usikkerhed m ³ n/h
22,32	3772,52	0,77	2,83	3,50	0,67	0,04
22,32	3574,82	1,94	6,80	7,00	0,20	0,07
22,32	3362,12	3,46	11,38	11,00	-0,38	0,11
22,32	3121,02	4,89	14,93	14,50	-0,43	0,15
22,32	2857,32	6,62	18,53	17,50	-1,03	0,20
22,32	2860,22	6,57	18,39	17,50	-0,89	0,20
22,32	3143,62	5,05	15,55	14,50	-1,05	0,16
22,32	3390,22	3,42	11,36	11,00	-0,36	0,11
22,32	3607,22	1,89	6,66	7,00	0,34	0,07
22,32	3799,62	0,74	2,74	3,50	0,76	0,04

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.23

Cert. nr: 200-L-21244

Side: 3 af 4

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,3 ± 0,6
Relativ luftfugtighed (%) :	51 ± 10
Barometerstand (mbar) :	1015,6 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren $k = 2$, som for en normalfordeling svarer til en dæknings sandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato:

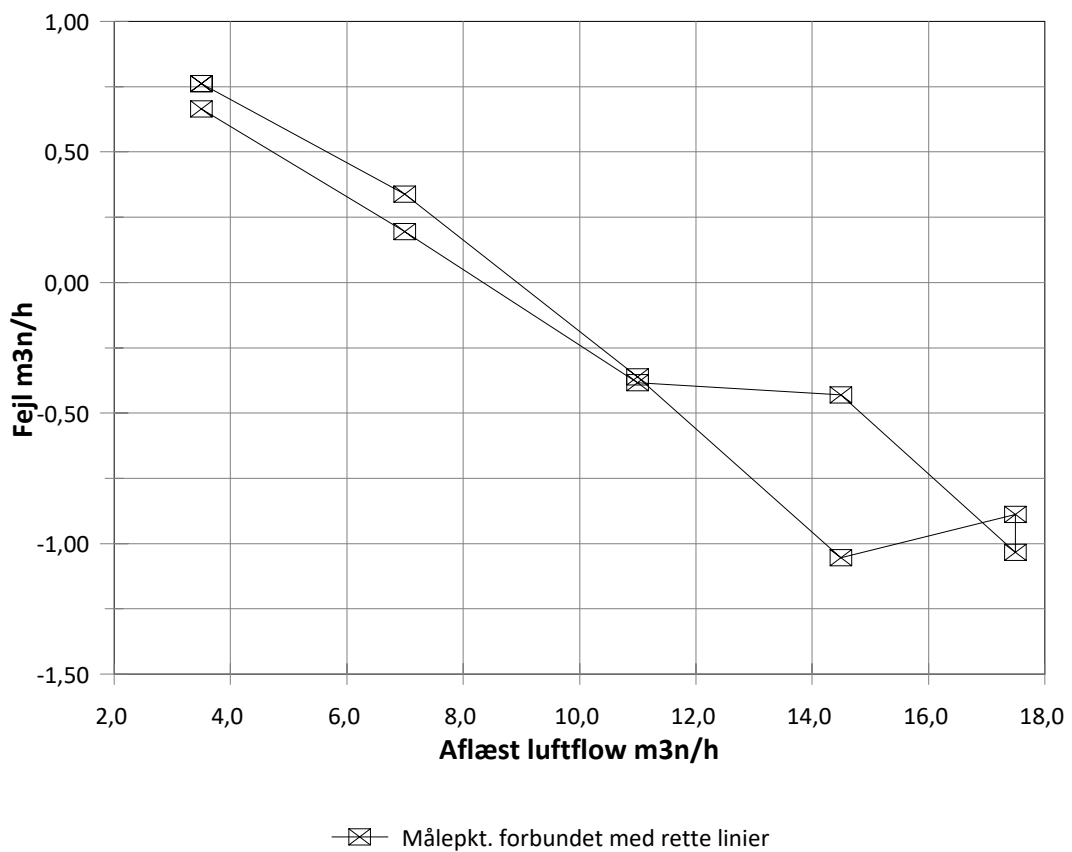
2019.09.23

Cert. nr.: 200-L-21244

Side : 4 af 4

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,04 m³n/h til

0,20 m³n/h

Kalibrering Humimeter, Fugtmåler

Måleskema til kontrol af Fugtmåler(EPA)

Dato: 17-09-2019

Udført af: REHV

Emne Id nr.: 145070

Certifikat nr.: ELAB-38-2019

Kalibrator ref.: 148135 (test block)

Fremgangsmetode: Fugtmåler kontrolleres op imod test block fra samme producent. Er visningen indenfor range er grundkalibrering OK.
https://www.youtube.com/watch?v=wmGgFWhd_Yk

- 1- Sørg for der ikke er fugt på nålene.
- 2- Tænd og aflæs rumtemperatur: 21,5 (range 20-26°C)
- 3- Find "Test Block"
- 4- Test side 1 "22,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med
- 5- Noter hvad apparatet måler: 22,3% (range 21,5-22,5%)
- 6- Test side 2 "41,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med
- 7- Noter hvad apparatet måler: 41,6% (range 39,5-42,0%)
- 8- Er visningerne uden for det anbefalede range kan punkter sidst i denne video følges, alternativt sendes apparat til kalibrering.
- 9- Apparat bruges normalt kun som rettesnor for fugtniveau, ikke til endelig fugtangivelse. Til endeligt fugtangivelse benyttes oven i mellemgang.

Kalibrering Humimeter, Fugtmåler

Måleskema til kontrol af Fugtmåler(EPA)

Dato: 17-09-2019

Udført af: REHV

Emne Id nr.: 176783

Certifikat nr.: ELAB-38-2019

Kalibrator ref.: 148135 (test block)

Fremgangsmetode: Fugtmåler kontrolleres op imod test block fra samme producent. Er visningen indenfor range er grundkalibrering OK.
https://www.youtube.com/watch?v=wmGgFWhd_Yk

- 1- Sørg for der ikke er fugt på nålene.
- 2- Tænd og aflæs rumtemperatur: 20,5 (range 20-26°C)
- 3- Find "Test Block"
- 4- Test side 1 "22,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med
- 5- Noter hvad apparatet måler: 22,3% (range 21,5-22,5%)
- 6- Test side 2 "41,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med
- 7- Noter hvad apparatet måler: 41,5% (range 39,5-42,0%)
- 8- Er visningerne uden for det anbefalede range kan punkter sidst i denne video følges, alternativt sendes apparat til kalibrering.
- 9- Apparat bruges normalt kun som rettesnor for fugtniveau, ikke til endelig fugtangivelse. Til endeligt fugtangivelse benyttes oven i mellemgang.



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-25000

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Vacuummeter, EPA (-H)

Fabrikat:	Wika	Serienr.:	N/A
Kundemærke:	145074	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvissionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **17-09-2019**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

**Godkendt og
digitalt signeret
18-09-2019 af:**

Mette Pedersen
Kvalitets & måletekniker



DANAK
CAL Reg.nr. 200

TRYKLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25000

Side 2 af 4

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0500	-0,05	-0,0500	-0,05
-0,1999	-0,20	-0,1999	-0,20
-0,3999	-0,41	-0,3999	-0,41
-0,5999	-0,61	-0,5999	-0,61
-0,7999	-0,80	-0,7999	-0,80
-0,9498	-0,95	-0,9498	-0,95

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25000

Side 3 af 4

KALIBRERINGS CERTIFIKAT

Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysteresese bar	Fejl bar	Usikkerhed bar
-0,0500	-0,0500	0,01	0,0000	0,0000	0,0058
-0,1999	-0,2000	0,01	0,0000	-0,0001	0,0058
-0,3999	-0,4100	0,01	0,0000	-0,0101	0,0058
-0,5999	-0,6100	0,01	0,0000	-0,0101	0,0058
-0,7999	-0,8000	0,01	0,0000	-0,0001	0,0058
-0,9498	-0,9500	0,01	0,0000	-0,0002	0,0058

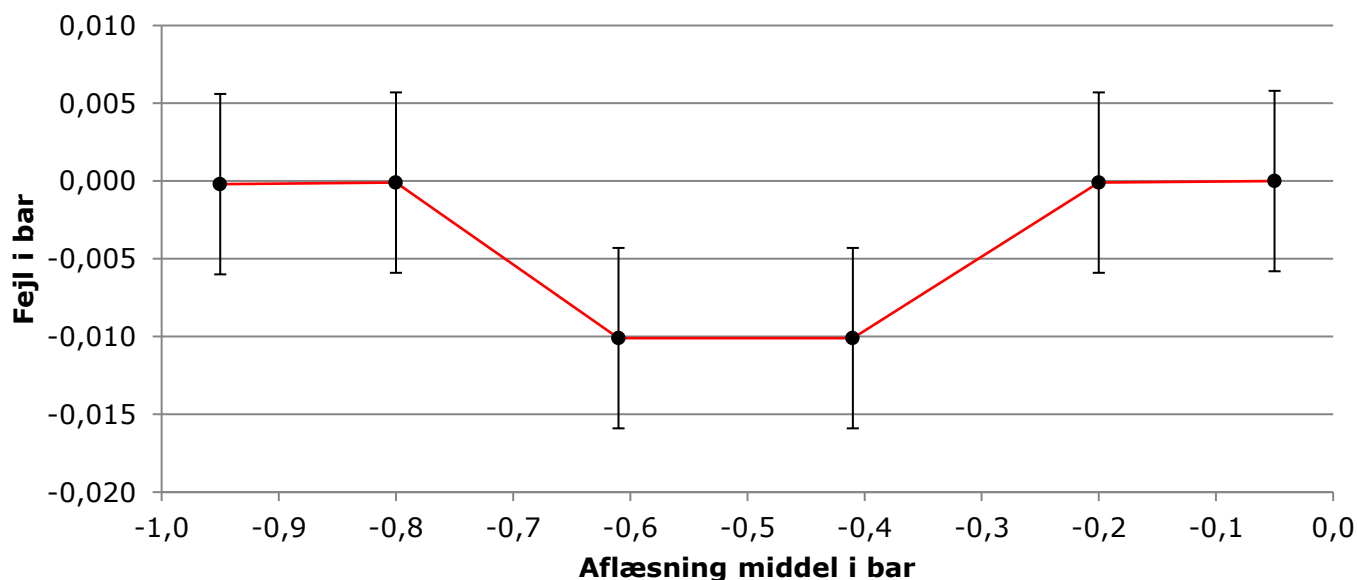
Maks. hysteresese: 0,0000 bar
Maks. fejl: -0,0101 bar
Maks. relativ fejl
i forhold til måleområdet: 1,0 %

TRYKLABORATORIET TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25000

Side 4 af 4

KALIBRERINGSCERTIFIKAT Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteres fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	19,9 °C ± 0,3 °C
Relativ fugtighed:	44 %rh ± 4,2 %rh
Barometerstand:	1007 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-24999

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Vacuummeter, EPA (-D)

Fabrikat:	Wika	Serienr.:	N/A
Kundemærke:	145076	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvissionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **17-09-2019**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

**Godkendt og
digitalt signeret
18-09-2019 af:**

Mette Pedersen
Kvalitets & måletekniker



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TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24999

Side 2 af 4

KALIBRERINGSCERTIFIKAT

Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0500	-0,04	-0,0500	-0,04
-0,1999	-0,19	-0,1999	-0,19
-0,3999	-0,39	-0,3999	-0,39
-0,5999	-0,60	-0,5999	-0,60
-0,7999	-0,80	-0,7999	-0,80
-0,9498	-0,95	-0,9498	-0,95

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24999

Side 3 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysteresese bar	Fejl bar	Usikkerhed bar
-0,0500	-0,0400	0,01	0,0000	0,0100	0,0058
-0,1999	-0,1900	0,01	0,0000	0,0099	0,0058
-0,3999	-0,3900	0,01	0,0000	0,0099	0,0058
-0,5999	-0,6000	0,01	0,0000	-0,0001	0,0058
-0,7999	-0,8000	0,01	0,0000	-0,0001	0,0058
-0,9498	-0,9500	0,01	0,0000	-0,0002	0,0058

Maks. hysteresese: 0,0000 bar
Maks. fejl: 0,0100 bar
Maks. relativ fejl
i forhold til måleområdet: 1,0 %

TRYKLABORATORIET

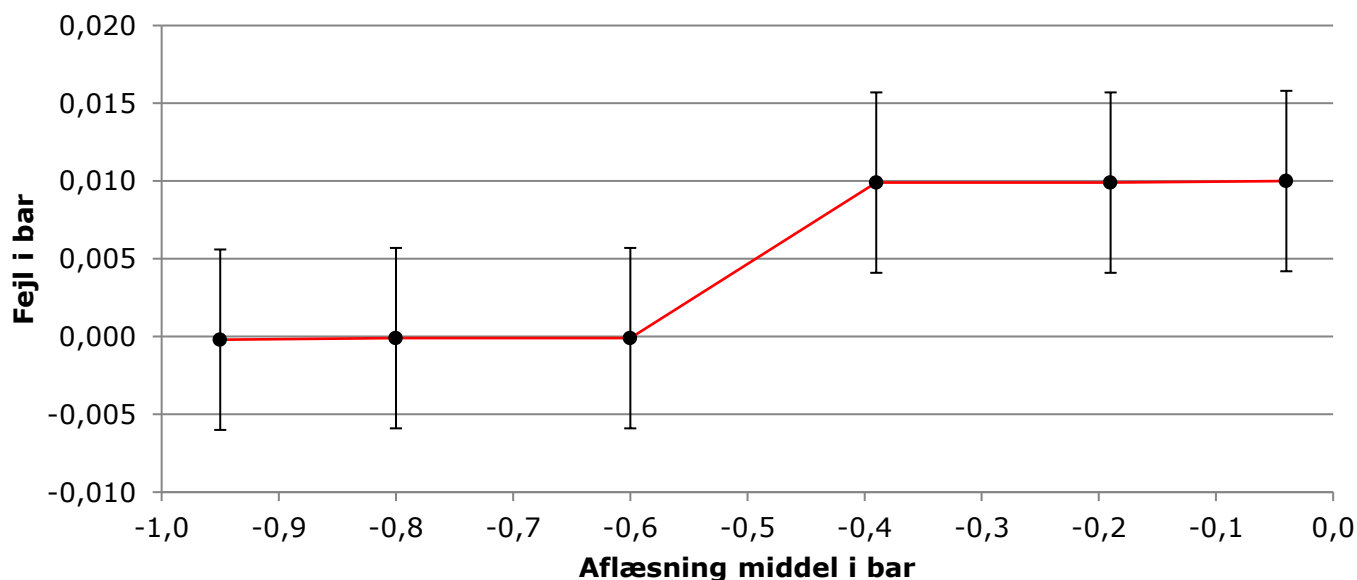
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-24999

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	44,9 %rh ± 4,2 %rh
Barometerstand:	1006,9 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-25001

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Vacuummeter, EPA (-R)

Fabrikat:	Wika	Serienr.:	N/A
Kundemærke:	145077	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvissionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **17-09-2019**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og
digitalt signeret
18-09-2019 af:

Mette Pedersen
Kvalitets & måletekniker



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TRYKLABORATORIET
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25001

Side 2 af 4

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0500	-0,04	-0,0500	-0,04
-0,1999	-0,19	-0,1999	-0,19
-0,3999	-0,39	-0,3999	-0,39
-0,5999	-0,60	-0,5999	-0,60
-0,7999	-0,79	-0,7999	-0,79
-0,9498	-0,94	-0,9498	-0,94

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TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25001

Side 3 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysteresese bar	Fejl bar	Usikkerhed bar
-0,0500	-0,0400	0,01	0,0000	0,0100	0,0058
-0,1999	-0,1900	0,01	0,0000	0,0099	0,0058
-0,3999	-0,3900	0,01	0,0000	0,0099	0,0058
-0,5999	-0,6000	0,01	0,0000	-0,0001	0,0058
-0,7999	-0,7900	0,01	0,0000	0,0099	0,0058
-0,9498	-0,9400	0,01	0,0000	0,0098	0,0058

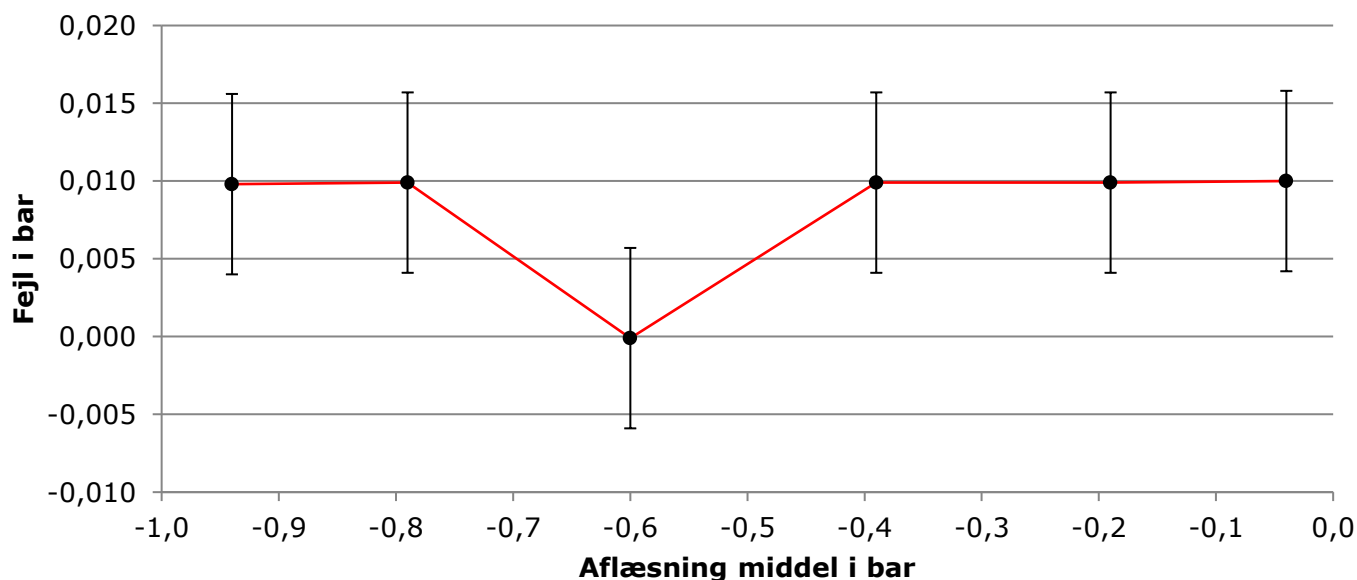
Maks. hysteresese: 0,0000 bar
Maks. fejl: 0,0100 bar
Maks. relativ fejl
i forhold til måleområdet: 1,0 %

TRYKLABORATORIET TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25001

Side 4 af 4

KALIBRERINGSCERTIFIKAT Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	45,1 %rh ± 4,2 %rh
Barometerstand:	1006,8 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-25003

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Manometer, EPA (-H)

Fabrikat:	WIKA	Serienr.:	N/A
Kundemærke:	145078	Område:	0 - 10 mbar
Klasse:	1,6	Inddeling:	0,2 mbar
Diameter:	100 mm.		

Rekvisitionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **17-09-2019**

Procedure: D1-2.1

Bemærkninger: Viser er nulstillet inden kalibrering. Viser "hænger" og urværk kører ujævnt.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

**Godkendt og
digitalt signeret
19-09-2019 af:**

Mette Pedersen
Kvalitets & måletekniker



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Certifikat nr.: 200-P-25003

Side 2 af 4

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - 10 mbar

Reference Op 1 mbar	Aflæsning mbar	Reference Ned 1 mbar	Aflæsning mbar
0,000	0,00	0,000	0,00
1,987	2,16	1,987	2,20
3,986	4,36	3,986	4,36
5,985	6,56	5,985	6,56
7,983	8,76	7,983	8,76
9,133	10,00	9,133	10,00

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Certifikat nr.: 200-P-25003

Side 3 af 4

KALIBRERINGSCERTIFIKAT

Resultater

Måleområde: 0 - 10 mbar

Reference middelværdi mbar	Aflæsning middelværdi mbar	Opløsning mbar	Hysteresese mbar	Fejl mbar	Usikkerhed mbar
0,000	0,000	0,04	0,000	0,000	0,036
1,987	2,180	0,04	0,040	0,193	0,067
3,986	4,360	0,04	0,000	0,374	0,037
5,985	6,560	0,04	0,000	0,575	0,037
7,983	8,760	0,04	0,000	0,777	0,037
9,133	10,000	0,04	0,000	0,867	0,037

Maks. hysteresese: 0,040 mbar
Maks. fejl: 0,867 mbar
Maks. relativ fejl
i forhold til måleområdet: 8,7 %

TRYKLABORATORIET

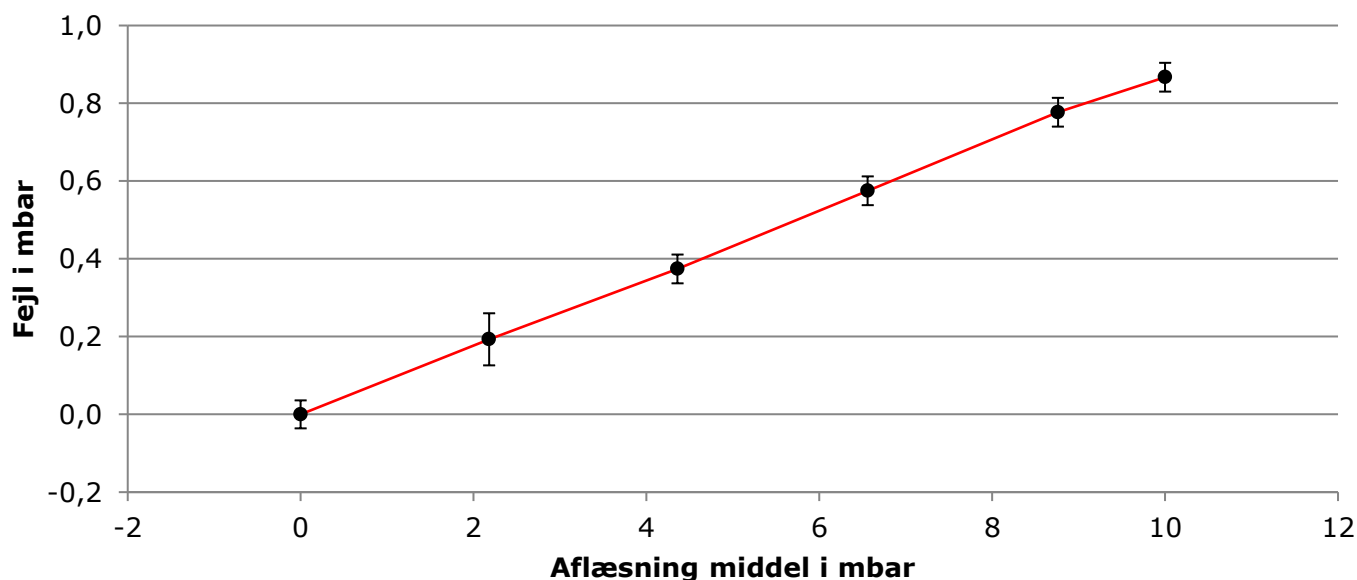
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25003

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	45 %rh ± 4,2 %rh
Barometerstand:	1006,8 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.



KALIBRERINGS CERTIFIKAT

CERTIFIKATNR.:

200-P-25002

Side 1 af 4
Antal bilag: 0

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: Manometer, EPA (-D)

Fabrikat: WIKA
Kundemærke: **145079**
Klasse: 1,6
Diameter: 100 mm.

Serienr.: **N/A**
Område: 0 - 10 mbar
Inddeling: 0,2 mbar

Rekvisitionsnr.: MXB

Periode: Modtaget: 10-09-2019

Kalibreret: 17-09-2019

Procedure: D1-2.1

Bemærkninger: Viser "hænger" og urværk kører ujævnt.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

**Godkendt og
digitalt signeret
18-09-2019 af:**

Mette Pedersen
Kvalitets & måletekniker



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Certifikat nr.: 200-P-25002

Side 2 af 4

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - 10 mbar

Reference Op 1 mbar	Aflæsning mbar	Reference Ned 1 mbar	Aflæsning mbar
0,000	0,00	0,000	0,00
1,987	2,16	1,987	2,16
3,986	4,24	3,986	4,24
5,985	6,40	5,985	6,40
7,983	8,48	7,983	8,48
9,432	10,00	9,432	10,00

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Certifikat nr.: 200-P-25002

Side 3 af 4

KALIBRERINGS CERTIFIKAT

Resultater

Måleområde: 0 - 10 mbar

Reference middelværdi mbar	Aflæsning middelværdi mbar	Opløsning mbar	Hysteresese mbar	Fejl mbar	Usikkerhed mbar
0,000	0,000	0,04	0,000	0,000	0,036
1,987	2,160	0,04	0,000	0,173	0,036
3,986	4,240	0,04	0,000	0,254	0,037
5,985	6,400	0,04	0,000	0,415	0,037
7,983	8,480	0,04	0,000	0,497	0,037
9,432	10,000	0,04	0,000	0,568	0,037

Maks. hysteresese: 0,000 mbar
Maks. fejl: 0,568 mbar
Maks. relativ fejl
i forhold til måleområdet: 5,7 %

TRYKLABORATORIET

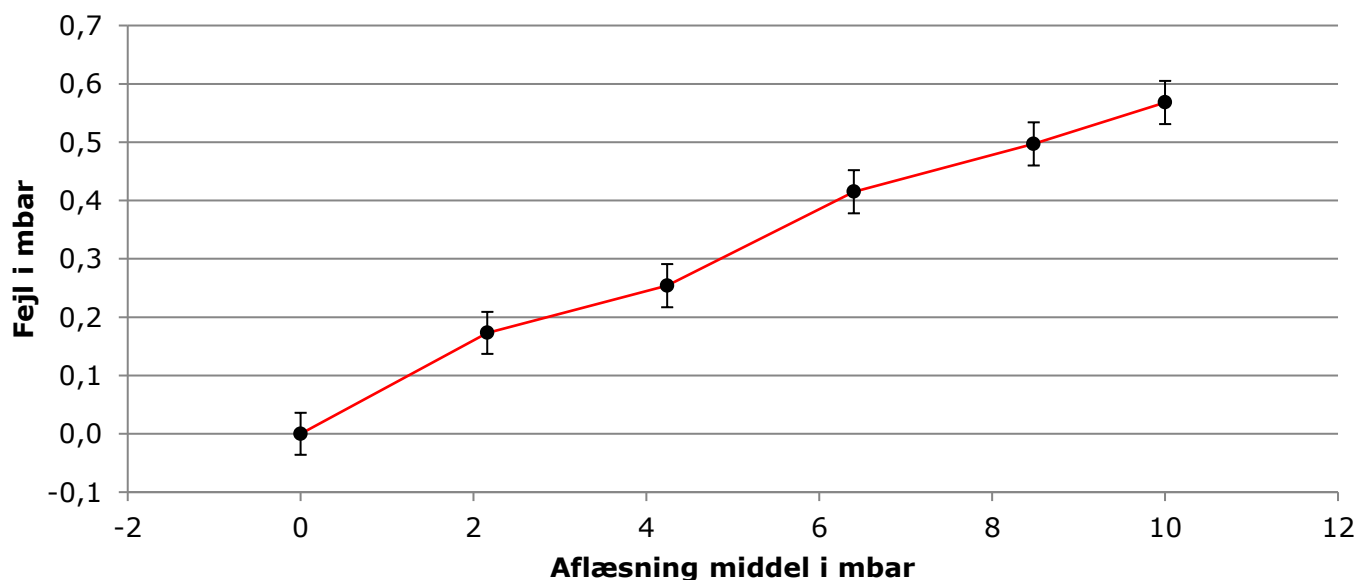
TEKNOLOGISK INSTITUT

Certifikat nr.: 200-P-25002

Side 4 af 4

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:

Fejl = aflæsning middel - referenceværdi.

Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysteresis fra det kalibrerede emne.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k=2$, således at dæknings sandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	44,6 %rh ± 4,2 %rh
Barometerstand:	1006,7 mbar ± 2,0 mbar

Sporbarhed:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Internt kalibreringscertifikat vedr. kalibrering af Termometer i Brænderum			Afdeling: DTI/	Laboratorium:
			Energi	ELAB
			Afdelingsnummer:	Certifikatnummer:
			186	ELAB-40-2019
	Reference: JOFRA	Dato for kalibreringens udførelse:		
	270-A-0912	03-10-2019		
Vedr. akkr. Nr.:	Emne (Brænderum)		Udført af:	
300	Id nr.: 177617		MXB	

270-A-0912
 Ref. JOFRA
 30 °C

Id Nr.: 177617
 Vist på termometer
 30 °C

Fejl: 0 °C
 Krav: 2,2 °C

OK Grøn

23.09.2019

Y:\Labspace\LAB2C_Labspace\Kalibrering Arbejdskopi\2019\EPA-Certifikater 3Kv 2019\29-Id-169522-ELAB-39-2019.docx

MXB

Kontrol af lækage efter pumper i forbindelse med EPA målinger på stand E.

Dato: 23.09.2019

Int.: MXB

Ref.: 270-A-2406 (TSI)

Id nr.: 169522

Cert nr.: ELAB-39-2019

Kontrol af lækage efter pumpen på "Hel" serie

Startværdi: **1710** Pa

Slutværdi efter 1 minut: **1599** Pa

Kontrol af lækage efter pumpen på "Delt" serien

Startværdi: **1800** Pa

Slutværdi efter 1 minut: **1714** Pa

Kontrol af lækage efter pumpen på "Rum" serien

Startværdi: **1800** Pa

Slutværdi efter 1 minut: **1758** Pa

(Krav er startværdi < 1800Pa og slutværdi >1300Pa ved 1 minuts måletid)

Luk de 2 drøvleventiler helt, og påfør tryk med håndpumpe på udgang af kugleflowmeteret (Øverst).

Annex 14

Title: HF1 ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E3053 and E2515

Appendix 14-1

EN-NS-EPA-Ber 3-56 03-03-2020 MXB

Manufacturer: Morsø
Type: 2B Standard 2020
ELAB no.: 2472
Order number: #N/A
Testdate: 05-02-20
File Name: HF1 ASTM pm calc
Testrun: #1
Fil dato og tid (Start): 02-05-20 08:40:07

Weight of test fuel spacers, dry basis, kg

E2780

$$\text{Equation (1)} \quad M_{Sdb} = (M_{Swb}) * \left(\frac{100}{100 + FM_s} \right)$$

M_swb 0 kg (wet basis)
FM_s 0 % (dry basis)

$$M_{Sdb} = (0) \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Sdb} = 0 \text{ kg (dry basis)}$$

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$\text{Equation (2)} \quad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}} \right)$$

M_CPnwb #REF! kg (wet basis)
FM_CPn 0 % (dry basis)

$$M_{Cdb} = \Sigma[(\#\#\#)] \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Cdb} = \#\#\# \text{ kg (dry basis)}$$

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$\text{Equation (3)} \quad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb #REF! kg (dry basis)
V_C #N/A m3

$$D_{Cdb} = \#\#\# / \#\#\# \text{ kg (dry) / m3}$$

$$D_{Cdb} = \#\#\# \text{ kg (dry) / m3}$$

Total weight of fuel crip excluding nails, dry basis, kg
E2780

Equation (4) $M_{FTAdb} = M_{Sdb} + M_{Cdb}$

M_Sdb 0 kg (dry basis)
M_Cdb #REF! kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)

E2780

Equation (5) $BR = \frac{60 * M_{FTAdb}}{\theta}$

M_FTAdb #REF! kg (dry basis)
 θ 100,05 min

BR = $\frac{60}{100} \times \frac{\#REF!}{100}$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	1,00 (Direkt)				
K_p	34,97 -				
C_p	0,99 -				
ΔP_{avg}	2,47 mmVS	P_Dynamisk	24,20 Pa		
T_s	303,60 K	T_Kanal	30,60 °C		
P_s	763,22 mmHg	P_s	101763 Pa	Ps_Tryk	-37 Pa
M_s	29,00 g/g mole				

$$V_{_s} = 1,00 \times 34,97 \times 0,99 \times \left(2,47 \right)^{0,5} \times \left(\frac{303,60}{763,22 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 6,37 \text{ m/s (V_{scent})}$$

Pitot tube factor for center:

E2515

$$\text{Equation (1)} \quad F_p = \frac{V_{strav}}{V_{scent}}$$

V_strav	6,16 m/s	(Average)
V_scent	6,37 m/s	(Average)

$$F_p = \frac{6,16}{6,37}$$

$$F_p = 0,9664 \text{ -}$$

Air velocity in dilution tunnel during test charge

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	0,9664 -		
K_p	34,97 -		
C_p	0,99 -		
Delta P_avg	2,74 mmVS	P_Dynamisk	26,86 Pa
T_s	308,87 K		
P_s	763,19 mmHg		
M_s	29,00 g/g mole		

$$V_{_s} = 0,9664 \times 34,97 \times 0,99 \times (2,74)^{0,5} \times \left(\frac{308,87}{763,19 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 6,54 \text{ m/s (V_{scent})}$$

Average gas flow rate in dilution tunnel:

E2515

$$\text{Equation (3)} \quad Q_{std} = 60 * (1 - B_{ws}) * V_s * A * \left(\frac{T_{std} * P_s}{T_s * P_{std}} \right)$$

B_ws	0,02 -				
V_s	6,541306 m/s				
A	0,017671 m ²				
T_std	293 K				
P_s	763,1867 mmHg	P_s	#### Pa	Ps_Tryk	-42 Pa
T_s	308,874 K	T_Kanal	35,9 °C		
P_std	760 mmHg				

$$Q_{_std} = 60 \times (1 - 0,02) \times 6,5 \times 0 \times \left(\frac{293 \times 763}{308,87 \times 760} \right)$$

$$Q_{_std} = 6,47467 \text{ dscm/min}$$

Measurements sample train 1 entire charge

E2515

$$\text{Equation (7}_1\text{)} \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,68114 dcm		
K_1	0,3855 K/mmHg		
Y	0,9953 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	100,05 min		

$$V_{mc} = 0,68114 - (0 - 0) \times 100$$

$$V_{mc} = 0,68114 \text{ dscm}$$

$$V_{mc(std)} = 0,3855 \times 0,68114 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,72755 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,7 mg
m_f	1,1 mg
m_g	1,9 mg

$$m_n = 0,7 + 1,1 + 1,9$$

$$m_n = 3,7 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	3,7 mg
V_m(std)	0,727553 dscm

$$C_s = 0,001 \times \frac{3,7}{0,72755}$$

$$C_s = 0,00509 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,005086 g/dscm
c_r	-0,000149 g/dscm
Q_std	6,47467 dscm/min
θ	100,05 min

$$E_T = (0 - -0) \times 6,5 \times 100$$

$$E_T = 3,3908 \text{ g}$$

Measurements sample train 2 first hour of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,40476 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	60 min		

$$V_{mc} = 0,40476 - (0 - 0) \times 60$$

$$V_{mc} = 0,40476 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,40476 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,43351 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,3 mg
m_f	1,8 mg
m_g	0,5 mg

$$m_n = 0,3 + 1,8 + 0,5$$

$$m_n = 2,6 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	2,6 mg
V_m(std)	0,433513 dscm

$$C_s = 0,001 \times \frac{2,6}{0,43351}$$

$$C_s = 0,006 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,005998 g/dscm
c_r	-0,000149 g/dscm
Q_std	6,47467 dscm/min
θ	60 min

$$E_T = (0 - -0) \times 6,5 \times 60$$

$$E_T = 2,38774 \text{ g}$$

Measurements sample train 2 from 1 hour and rest of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,27974 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	40,05 min		

$$V_{mc} = 0,27974 - (0 - 0) \times 40$$

$$V_{mc} = 0,27974 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,27974 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,29961 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,7 mg
m_f	0,8 mg
m_g	0,2 mg

$$m_n = 0,7 + 0,8 + 0,2$$

$$m_n = 1,7 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	1,7 mg
V_m(std)	0,299612 dscm

$$C_s = 0,001 \times \frac{1,7}{0,29961}$$

$$C_s = 0,00567 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,005674 g/dscm
c_r	-0,000149 g/dscm
Q_std	6,47467 dscm/min
θ	40,05 min

$$E_T = (0 - -0) \times 6,5 \times 40$$

$$E_T = 1,50993 \text{ g}$$

Room blanc

E2515

$$\text{Equation (8)} \quad V_{mr}(\text{std}) = K_1 * V_{mr} * Y * \left(\frac{P_{\text{bar}} + \frac{\Delta H}{13,6}}{T_m} \right)$$

K_1	0,3855 K/mmHg		
V_mr	0,674959 dcm		
Y	1 Gasmåler Faktor		
P_bar	763,5611 mmHg	P_bar	1018 mBar
Delta_H	0 mmVS		
T_m	295,7495 K	T_Gasmåler	22,7495 °C

$$V_{mr}(\text{std}) = 0,3855 \times 0,67496 \times 1 \times \left(\frac{763,6 + \frac{0}{13,6}}{296} \right)$$

$$V_{mr}(\text{std}) = 0,67177 \text{ dscm}$$

$$\text{Equation (14)} \quad C_r = K_2 * \frac{m_r}{V_{m_r}(\text{std})}$$

K_2	0,001 g/mg
m_r	-0,1 mg
V_m_r(std)	0,671771 dscm

$$C_r = 0,001 \times \frac{-0,1}{0,67177}$$

$$C_r = -0,00015 \text{ g/dscm}$$

Proportional Rate first 10 minutes

E2515

$$\text{Equation (16)} \quad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	100,05 min
V_{mi}	0,073284 l
V_s	6,54 m/s
T_m	299,311 K
T_{si}	298,8201 K
V_m	0,75 l
V_{si}	6,52 m/s
T_s	308,874 K
T_{mi}	299,7129 K

$$PR = \frac{100,05}{10} \times \frac{(0,07 \times 6,54 \times 299,3 \times 299)}{(1 \times 6,52 \times 308,9 \times 300)} \times 100$$

$$PR = 95,1647 \text{ -}$$

Notation and units**E2780**

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
	FM_CPn	average fuel moisture of test fuel piece n in fuel crib, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crib, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m ³
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m ³
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimensionless (assigned a value of 0.99)
	ΔP_{avg}	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m ²	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m ³ /min	Leakage rate observed during the post-test leakcheck
	L_a	m ³ /min	Maximum acceptable leakage rate for either a orestest og post-test leak-check, equal to 0.0003 m ³ /min
	θ	Min	Total sampling time
	V_mc	-	$V_m - (L_p - L_a) * \theta$
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Concentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute average dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 15

Title: LF ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E3053 and E2515

Appendix 15-1

EN-NS-EPA-Ber 3-56 03-03-2020 MXB

Manufacturer: Morsø
Type: 2B Std 2020
ELAB no.: 2472
Order number: #N/A
Testdate: 05-02-20 08:40:07
File Name: Ny 3.57 LF be m CSA input data
Testrun: #2
Fil dato og tid (Start): 05-02-20 08:40:07

Weight of test fuel spacers, dry basis, kg

E2780

$$\text{Equation (1)} \quad M_{Sdb} = (M_{Swb}) * \left(\frac{100}{100 + FM_s} \right)$$

M_swab 0 kg (wet basis)
FM_s 0 % (dry basis)

$$M_{Sdb} = (0) \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Sdb} = 0 \text{ kg (dry basis)}$$

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$\text{Equation (2)} \quad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}} \right)$$

M_CPnwb #REF! kg (wet basis)
FM_CPn 0 % (dry basis)

$$M_{Cdb} = \Sigma[(\#\#\#) \times \left(\frac{100}{(100 + 0)} \right)] \text{ kg (dry basis)}$$

$$M_{Cdb} = \#\#\# \text{ kg (dry basis)}$$

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$\text{Equation (3)} \quad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb #REF! kg (dry basis)
V_C #N/A m3

$$D_{Cdb} = \#\#\# / \#\#\# \text{ kg (dry) / m3}$$

$$D_{Cdb} = \#\#\# \text{ kg (dry) / m3}$$

Total weight of fuel crip excluding nails, dry basis, kg

E2780

$$\text{Equation (4)} \quad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb 0 kg (dry basis)
M_Cdb #REF! kg (dry basis)

$$M_{FTAdb} = 0 + \#REF! \text{ kg (dry basis)}$$

$$M_{FTAdb} = \#REF! \text{ kg (dry basis)}$$

Burn rate, kg (dry/h)

E2780

$$\text{Equation (5)} \quad BR = \frac{60 * M_{FTAdb}}{\theta}$$

M_FTAdb #REF! kg (dry basis)
 θ 384,15 min

$$BR = \frac{60 \times \#REF!}{384}$$

$$BR = \#REF!$$

Air velocity in tunnel at traverse measurements:

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	1,00 (Direkt)				
K_p	34,97 -				
C_p	0,99 -				
ΔP_{avg}	2,79 mmVS	P_Dynamisk	27,40 Pa		
T_s	297,00 K	T_Kanal	24,00 °C		
P_s	768,32 mmHg	P_s	102442 Pa	Ps_Tryk	-43 Pa
M_s	29,00 g/g mole				

$$V_s = 1,00 \times 34,97 \times 0,99 \times (2,79)^{0,5} \times \left(\frac{297,00}{768,32 \times 29,00} \right)^{0,5}$$

$$V_s = 6,68 \text{ m/s (V_scent)}$$

Pitot tube factor for center:

E2515

$$\text{Equation (1)} \quad F_p = \frac{V_{strav}}{V_{scent}}$$

V_strav	6,07 m/s	(Average)
V_scent	6,68 m/s	(Average)

$$F_p = \frac{6,07}{6,68}$$

$$F_p = 0,9078 \text{ -}$$

Air velocity in dilution tunnel during test

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	0,9078 -		
K_p	34,97 -		
C_p	0,99 -		
Delta P_avg	2,58 mmVS	P_Dynamisk	25,29 Pa
T_s	299,21 K		
P_s	768,34 mmHg		
M_s	29,00 g/g mole		

$$V_{_s} = 0,9078 \times 34,97 \times 0,99 \times \left(2,58 \right)^{0,5} \times \left(\frac{299,21}{768,34 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 5,85 \text{ m/s (V_{scent})}$$

Average gas flow rate in dilution tunnel:

E2515

$$\text{Equation (3)} \quad Q_{std} = 60 * (1 - B_{ws}) * V_s * A * \left(\frac{T_{std} * P_s}{T_s * P_{std}} \right)$$

B_ws	0,02 -				
V_s	5,849008 m/s				
A	0,017671 m ²				
T_std	293 K				
P_s	768,3448 mmHg	P_s	#### Pa	Ps_Tryk	-39 Pa
T_s	299,2108 K	T_Kanal	26,2 °C		
P_std	760 mmHg				

$$Q_{_std} = 60 \times \left(1 - 0,02 \right) \times 5,8 \times 0 \times \left(\frac{293 \times 768}{299,21 \times 760} \right)$$

$$Q_{_std} = 6,01679 \text{ dscm/min}$$

Measurements sample train 1 entire charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	2,56885 dcm		
K_1	0,3855 K/mmHg		
Y	0,9953 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	384,15 min		

$$V_{mc} = 2,56885 - (0 - 0) \times 384$$

$$V_{mc} = 2,56885 \text{ dscm}$$

$$V_{mc(std)} = 0,3855 \times 2,56885 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 2,74389 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,3 mg
m_f	-0,8 mg
m_g	1,8 mg

$$m_n = 0,3 + -0,8 + 1,8$$

$$m_n = 1,3 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	1,3 mg
V_m(std)	2,743893 dscm

$$C_s = 0,001 \times \frac{1,3}{2,74389}$$

$$C_s = 0,00047 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,000474 g/dscm
c_r	-1,09E-16 g/dscm
Q_std	6,01679 dscm/min
θ	384,15 min

$$E_T = (0 - -0) \times 6 \times 384$$

$$E_T = 1,09507 \text{ g}$$

Measurements sample train 2 first hour of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,39478 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	60 min		

$$V_{mc} = 0,39478 - (0 - 0) \times 60$$

$$V_{mc} = 0,39478 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,39478 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,42282 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,5 mg
m_f	-0,1 mg
m_g	0,86 mg

$$m_n = 0,5 + -0,1 + 0,86$$

$$m_n = 1,26 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	1,26 mg
V_m(std)	0,422824 dscm

$$C_s = 0,001 \times \frac{1,26}{0,42282}$$

$$C_s = 0,00298 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,00298 g/dscm
c_r	-1,09E-16 g/dscm
Q_std	6,01679 dscm/min
θ	60 min

$$E_T = (0 - -0) \times 6 \times 60$$

$$E_T = 1,07579 \text{ g}$$

Measurements sample train 2 from 1 hour and rest of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	2,1638 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	324,15 min		

$$V_{mc} = 2,1638 - (0 - 0) \times 324$$

$$V_{mc} = 2,1638 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 2,1638 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 2,31751 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	-1,3 mg
m_g	1,4 mg

$$m_n = 0 + -1,3 + 1,4$$

$$m_n = 0,1 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	0,1 mg
V_m(std)	2,317512 dscm

$$C_s = 0,001 \times \frac{0,1}{2,31751}$$

$$C_s = 4,3E-05 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	4,31E-05 g/dscm
c_r	-1,09E-16 g/dscm
Q_std	6,01679 dscm/min
θ	324,15 min

$$E_T = (0 - -0) \times 6 \times 324$$

$$E_T = 0,08416 \text{ g}$$

Room blanc

E2515

$$\text{Equation (8)} \quad V_{mr(std)} = K_1 * V_{mr} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

K_1	0,3855 K/mmHg		
V_mr	2,601019 dcm		
Y	1 Gasmåler Faktor		
P_bar	768,699 mmHg	P_bar	1024,85 mBar
Delta_H	0 mmVS		
T_m	294,7095 K	T_Gasmåler	21,7095 °C

$$V_{mr(std)} = 0,3855 \times 2,60102 \times 1 \times \left(\frac{768,7 + \frac{0}{13,6}}{295} \right)$$

$$V_{mr(std)} = 2,61535 \text{ dscm}$$

$$\text{Equation (14)} \quad C_r = K_2 * \frac{m_r}{V_{m_r(std)}}$$

K_2	0,001 g/mg
m_r	-2,84E-13 mg
V_m_r(std)	2,615351 dscm

$$C_r = 0,001 \times \frac{-3E-13}{2,61535}$$

$$C_r = -1,1E-16 \text{ g/dscm}$$

Proportional Rate first 10 minutes

E2515

$$\text{Equation (16)} \quad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	384,15 min
V_{mi}	0,073906 l
V_s	5,85 m/s
T_m	298,2358 K
T_{si}	310,1427 K
V_m	2,81 l
V_{si}	5,81 m/s
T_s	299,2108 K
T_{mi}	299,4171 K

$$PR = \frac{384,15}{10} \times \frac{(0,07 \times 5,85 \times 298,2 \times 310)}{(2,81 \times 5,81 \times 299,2 \times 299)} \times 100$$

$$PR = 105,136 \text{ -}$$

Notation and units**E2780**

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
	FM_CPn	average fuel moisture of test fuel piece n in fuel crib, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crib, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m ³
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m ³
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimensionless (assigned a value of 0.99)
	ΔP_{avg}	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m ²	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m ³ /min	Leakage rate observed during the post-test leakcheck
	L_a	m ³ /min	Maximum acceptable leakage rate for either a orestest og post-test leak-check, equal to 0.0003 m ³ /min
	θ	Min	Total sampling time
	V_mc	-	$V_m - (L_p - L_a) * \theta$
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Concentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute average dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 16

Title: HF2 ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E3053 and E2515

Appendix 16-1

EN-NS-EPA-Ber 3-57 03-03-2020 MXB

Manufacturer: Morsø
Type: 2B standard 2020
ELAB no.: 2472
Order number: #N/A
Testdate: 06-02-20 08:51:17
File Name: HF2 060220 m CSA input data
Testrun: #3
Fil dato og tid (Start): 06-02-20 08:51:17

Weight of test fuel spacers, dry basis, kg

E2780

$$\text{Equation (1)} \quad M_{Sdb} = (M_{Swb}) * \left(\frac{100}{100 + FM_s} \right)$$

M_swb 0 kg (wet basis)
FM_s 0 % (dry basis)

$$M_{Sdb} = (0) \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Sdb} = 0 \text{ kg (dry basis)}$$

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$\text{Equation (2)} \quad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}} \right)$$

M_CPnwb #REF! kg (wet basis)
FM_CPn 0 % (dry basis)

$$M_{Cdb} = \Sigma[(\#\#\#)] \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Cdb} = \#\#\# \text{ kg (dry basis)}$$

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$\text{Equation (3)} \quad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb #REF! kg (dry basis)
V_C #N/A m3

$$D_{Cdb} = \#\#\# / \#\#\# \text{ kg (dry) / m3}$$

$$D_{Cdb} = \#\#\# \text{ kg (dry) / m3}$$

Total weight of fuel crip excluding nails, dry basis, kg
E2780

Equation (4) $M_{FTAdb} = M_{Sdb} + M_{Cdb}$

M_Sdb 0 kg (dry basis)
M_Cdb #REF! kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)

E2780

Equation (5) $BR = \frac{60 * M_{FTAdb}}{\theta}$

M_FTAdb #REF! kg (dry basis)
 θ 106,37 min

BR = $\frac{60}{106} \times \#REF!$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	1,00 (Direkt)				
K_p	34,97 -				
C_p	0,99 -				
ΔP_{avg}	2,66 mmVS	P_Dynamisk	26,10 Pa		
T_s	297,30 K	T_Kanal	24,30 °C		
P_s	766,42 mmHg	P_s	102190 Pa	Ps_Tryk	-40 Pa
M_s	29,00 g/g mole				

$$V_s = 1,00 \times 34,97 \times 0,99 \times (2,66)^{0,5} \times \left(\frac{297,30}{766,42 \times 29,00} \right)^{0,5}$$

$$V_s = 6,53 \text{ m/s (V_scent)}$$

Pitot tube factor for center:

E2515

$$\text{Equation (1)} \quad F_p = \frac{V_{strav}}{V_{scent}}$$

V_strav	6,00 m/s	(Average)
V_scent	6,53 m/s	(Average)

$$F_p = \frac{6,00}{6,53}$$

$$F_p = 0,9187 \text{ -}$$

Air velocity in dilution tunnel during test charge

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	0,9187 -		
K_p	34,97 -		
C_p	0,99 -		
Delta P_avg	2,68 mmVS	P_Dynamisk	26,29 Pa
T_s	308,20 K		
P_s	766,42 mmHg		
M_s	29,00 g/g mole		

$$V_{_s} = 0,9187 \times 34,97 \times 0,99 \times (2,68)^{0,5} \times \left(\frac{308,20}{766,42 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 6,13 \text{ m/s (V_{scent})}$$

Average gas flow rate in dilution tunnel:

E2515

$$\text{Equation (3)} \quad Q_{std} = 60 * (1 - B_{ws}) * V_s * A * \left(\frac{T_{std} * P_s}{T_s * P_{std}} \right)$$

B_ws	0,02 -				
V_s	6,131739 m/s				
A	0,017671 m ²				
T_std	293 K				
P_s	766,4177 mmHg	P_s	#### Pa	Ps_Tryk	-41 Pa
T_s	308,201 K	T_Kanal	35,2 °C		
P_std	760 mmHg				

$$Q_{_std} = 60 \times (1 - 0,02) \times 6,1 \times 0 \times \left(\frac{293 \times 766}{308,2 \times 760} \right)$$

$$Q_{_std} = 6,10828 \text{ dscm/min}$$

Measurements sample train 1 entire charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,71341 dcm		
K_1	0,3855 K/mmHg		
Y	0,9953 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	106,3667 min		

$$V_{mc} = 0,71341 - (0 - 0) \times 106$$

$$V_{mc} = 0,71341 \text{ dscm}$$

$$V_{mc(std)} = 0,3855 \times 0,71341 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,76202 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0,1 mg
m_f	2,9 mg
m_g	0,8 mg

$$m_n = 0,1 + 2,9 + 0,8$$

$$m_n = 3,8 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	3,8 mg
V_m(std)	0,762022 dscm

$$C_s = 0,001 \times \frac{3,8}{0,76202}$$

$$C_s = 0,00499 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,004987 g/dscm
c_r	0 g/dscm
Q_std	6,10828 dscm/min
θ	106,3667 min

$$E_T = (0 - 0) \times 6,1 \times 106$$

$$E_T = 3,23997 \text{ g}$$

Measurements sample train 2 first hour of charge

E2515

$$\text{Equation (7}_1\text{)} \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,4067 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	60 min		

$$V_{mc} = 0,4067 - (0 - 0) \times 60$$

$$V_{mc} = 0,4067 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,4067 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,43559 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	2,5 mg
m_g	0,4 mg

$$m_n = 0 + 2,5 + 0,4$$

$$m_n = 2,9 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	2,9 mg
V_m(std)	0,435591 dscm

$$C_s = 0,001 \times \frac{2,9}{0,43559}$$

$$C_s = 0,00666 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,006658 g/dscm
c_r	0 g/dscm
Q_std	6,10828 dscm/min
θ	60 min

$$E_T = (0 - 0) \times 6,1 \times 60$$

$$E_T = 2,44 \text{ g}$$

Measurements sample train 2 from 1 hour and rest of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,30716 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	46,36667 min		

$$V_{mc} = 0,30716 - (0 - 0) \times 46$$

$$V_{mc} = 0,30716 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,30716 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,32898 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	1,1 mg
m_g	0,1 mg

$$m_n = 0 + 1,1 + 0,1$$

$$m_n = 1,2 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	1,2 mg
V_m(std)	0,32898 dscm

$$C_s = 0,001 \times \frac{1,2}{0,32898}$$

$$C_s = 0,00365 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,003648 g/dscm
c_r	0 g/dscm
Q_std	6,10828 dscm/min
θ	46,36667 min

$$E_T = (0 - 0) \times 6,1 \times 46$$

$$E_T = 1,03309 \text{ g}$$

Room blanc

E2515

$$\text{Equation (8)} \quad V_{mr(std)} = K_1 * V_{mr} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

K_1	0,3855 K/mmHg		
V_mr	0,717856 dcm		
Y	1 Gasmåler Faktor		
P_bar	766,7863 mmHg	P_bar	1022,3 mBar
Delta_H	0 mmVS		
T_m	295,7852 K	T_Gasmåler	22,7852 °C

$$V_{mr(std)} = 0,3855 \times 0,71786 \times 1 \times \left(\frac{766,8 + \frac{0}{13,6}}{296} \right)$$

$$V_{mr(std)} = 0,7174 \text{ dscm}$$

$$\text{Equation (14)} \quad C_r = K_2 * \frac{m_r}{V_{m_r(std)}}$$

K_2	0,001 g/mg
m_r	0 mg
V_m_r(std)	0,717397 dscm

$$C_r = 0,001 \times \frac{0}{0,7174}$$

$$C_r = 0 \text{ g/dscm}$$

Proportional Rate first 10 minutes

E2515

$$\text{Equation (16)} \quad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	106,37 min
V_{mi}	0,073635 l
V_s	6,13 m/s
T_m	299,1902 K
T_{si}	297,6813 K
V_m	0,78 l
V_{si}	6,04 m/s
T_s	308,201 K
T_{mi}	299,154 K

$$PR = \frac{106,37}{10} \times \frac{(0,07 \times 6,13 \times 299,2 \times 298)}{(1 \times 6,04 \times 308,2 \times 299)} \times 100$$

$$PR = 98,2243 \text{ -}$$

Notation and units**E2780**

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
	FM_CPn	average fuel moisture of test fuel piece n in fuel crib, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crib, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m ³
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m ³
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimensionless (assigned a value of 0.99)
	ΔP_{avg}	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m ²	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m ³ /min	Leakage rate observed during the post-test leakcheck
	L_a	m ³ /min	Maximum acceptable leakage rate for either a orestest og post-test leak-check, equal to 0.0003 m ³ /min
	θ	Min	Total sampling time
	V_mc	-	$V_m - (L_p - L_a) * \theta$
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Concentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute average dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 17

Title: MF ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E3053 and E2515

Appendix 17-1

EN-NS-EPA-Ber 3-58 04-03-2020 KMSA

Manufacturer: Morsø
Type: 2B standard 2020
ELAB no.: 2472
Order number: #N/A
Testdate: 06-02-20 08:51:17
File Name: Ny 3.58 MF ber m CSA input data
Testrun: #4
Fil dato og tid (Start): 06-02-20 08:51:17

Weight of test fuel spacers, dry basis, kg

E2780

$$\text{Equation (1)} \quad M_{Sdb} = (M_{Swb}) * \left(\frac{100}{100 + FM_s} \right)$$

M_swb 0 kg (wet basis)
FM_s 0 % (dry basis)

$$M_{Sdb} = (0) \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Sdb} = 0 \text{ kg (dry basis)}$$

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$\text{Equation (2)} \quad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}} \right)$$

M_CPnwb #REF! kg (wet basis)
FM_CPn 0 % (dry basis)

$$M_{Cdb} = \Sigma[(\#\#\#)] \times \left(\frac{100}{(100 + 0)} \right) \text{ kg (dry basis)}$$

$$M_{Cdb} = \#\#\# \text{ kg (dry basis)}$$

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$\text{Equation (3)} \quad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb #REF! kg (dry basis)
V_C #N/A m3

$$D_{Cdb} = \#\#\# / \#\#\# \text{ kg (dry) / m3}$$

$$D_{Cdb} = \#\#\# \text{ kg (dry) / m3}$$

Total weight of fuel crip excluding nails, dry basis, kg
E2780

Equation (4) $M_{FTAdb} = M_{Sdb} + M_{Cdb}$

M_Sdb 0 kg (dry basis)
M_Cdb #REF! kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)

E2780

Equation (5) $BR = \frac{60 * M_{FTAdb}}{\theta}$

M_FTAdb #REF! kg (dry basis)
 θ 292,05 min

BR = $\frac{60}{292} \times \#REF!$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	1,00 (Direkt)				
K_p	34,97 -				
C_p	0,99 -				
ΔP_{avg}	2,66 mmVS	P_Dynamisk	26,10 Pa		
T_s	297,30 K	T_Kanal	24,30 °C		
P_s	765,07 mmHg	P_s	102010 Pa	Ps_Tryk	-40 Pa
M_s	29,00 g/g mole				

$$V_{_s} = 1,00 \times 34,97 \times 0,99 \times (2,66)^{0,5} \times \left(\frac{297,30}{765,07 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 6,54 \text{ m/s (V_{scent})}$$

Pitot tube factor for center:

E2515

$$\text{Equation (1)} \quad F_p = \frac{V_{strav}}{V_{scent}}$$

V_strav	6,01 m/s	(Average)
V_scent	6,54 m/s	(Average)

$$F_p = \frac{6,01}{6,54}$$

$$F_p = 0,9187 \text{ -}$$

Air velocity in dilution tunnel during test charge

E2515

$$\text{Equation (9)} \quad V_s = F_p * K_p * C_p * \sqrt{\Delta P_{avg}} * \sqrt{\frac{T_s}{P_s * M_s}}$$

F_p	0,9187 -		
K_p	34,97 -		
C_p	0,99 -		
Delta P_avg	2,62 mmVS	P_Dynamisk	25,67 Pa
T_s	300,51 K		
P_s	765,08 mmHg		
M_s	29,00 g/g mole		

$$V_{_s} = 0,9187 \times 34,97 \times 0,99 \times \left(2,62 \right)^{0,5} \times \left(\frac{300,51}{765,08 \times 29,00} \right)^{0,5}$$

$$V_{_s} = 5,99 \text{ m/s (V_{scent})}$$

Average gas flow rate in dilution tunnel:

E2515

$$\text{Equation (3)} \quad Q_{std} = 60 * (1 - B_{ws}) * V_s * A * \left(\frac{T_{std} * P_s}{T_s * P_{std}} \right)$$

B_ws	0,02 -				
V_s	5,988595 m/s				
A	0,017671 m ²				
T_std	293 K				
P_s	765,078 mmHg	P_s	#### Pa	Ps_Tryk	-40 Pa
T_s	300,5107 K	T_Kanal	27,5 °C		
P_std	760 mmHg				

$$Q_{_std} = 60 \times \left(1 - 0,02 \right) \times 6 \times 0 \times \left(\frac{293 \times 765}{300,51 \times 760} \right)$$

$$Q_{_std} = 6,10765 \text{ dscm/min}$$

Measurements sample train 1 entire charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	1,94105 dcm		
K_1	0,3855 K/mmHg		
Y	0,9953 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	292,05 min		

$$V_{mc} = 1,94105 - (0 - 0) \times 292$$

$$V_{mc} = 1,94105 \text{ dscm}$$

$$V_{mc(std)} = 0,3855 \times 1,94105 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 2,07331 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	0,8 mg
m_g	0,2 mg

$$m_n = 0 + 0,8 + 0,2$$

$$m_n = 1 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	1 mg
V_m(std)	2,073314 dscm

$$C_s = 0,001 \times \frac{1}{2,07331}$$

$$C_s = 0,00048 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,000482 g/dscm
c_r	0 g/dscm
Q_std	6,107655 dscm/min
θ	292,05 min

$$E_T = (0 - 0) \times 6,1 \times 292$$

$$E_T = 0,86033 \text{ g}$$

Measurements sample train 2 first hour of charge

E2515

$$\text{Equation (7}_1\text{)} \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	0,39396 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	60 min		

$$V_{mc} = 0,39396 - (0 - 0) \times 60$$

$$V_{mc} = 0,39396 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 0,39396 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 0,42195 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	0,6 mg
m_g	0 mg

$$m_n = 0 + 0,6 + 0$$

$$m_n = 0,6 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	0,6 mg
V_m(std)	0,421946 dscm

$$C_s = 0,001 \times \frac{0,6}{0,42195}$$

$$C_s = 0,00142 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,001422 g/dscm
c_r	0 g/dscm
Q_std	6,107655 dscm/min
θ	60 min

$$E_T = (0 - 0) \times 6,1 \times 60$$

$$E_T = 0,5211 \text{ g}$$

Measurements sample train 2 from 1 hour and rest of charge

E2515

$$\text{Equation (7}_1) \quad V_{mc} = V_m - (L_p - L_a) * \theta$$

$$\text{Equation (7)} \quad V_{mc(std)} = K_1 * V_{mc} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

V_m	1,55412 dcm		
K_1	0,3855 K/mmHg		
Y	0,998 Gasmåler Faktor		
P_bar	759,9983 mmHg	P_bar	1013,25 mBar
Delta_H	0 mmVS		
T_m	273 K	T_Gasmåler	0 °C
L_p	0 m3/min		
L_a	0 m3/min		
θ	232,05 min		

$$V_{mc} = 1,55412 - (0 - 0) \times 232$$

$$V_{mc} = 1,55412 \text{ dcm}$$

$$V_{mc(std)} = 0,3855 \times 1,55412 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273} \right)$$

$$V_{mc(std)} = 1,66452 \text{ dscm}$$

$$\text{Equation (12)} \quad m_n = m_p + m_f + m_g$$

m_p	0 mg
m_f	-0,2 mg
m_g	0,5 mg

$$m_n = 0 + -0,2 + 0,5$$

$$m_n = 0,3 \text{ mg}$$

$$\text{Equation (13)} \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001 g/mg
m_n	0,3 mg
V_m(std)	1,664522 dscm

$$C_s = 0,001 \times \frac{0,3}{1,66452}$$

$$C_s = 0,00018 \text{ g/dscm}$$

$$\text{Equation (15)} \quad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,00018 g/dscm
c_r	0 g/dscm
Q_std	6,107655 dscm/min
θ	232,05 min

$$E_T = (0 - 0) \times 6,1 \times 232$$

$$E_T = 0,25544 \text{ g}$$

Room blanc

E2515

$$\text{Equation (8)} \quad V_{mr(std)} = K_1 * V_{mr} * Y * \left(\frac{P_{bar} + \frac{\Delta H}{13,6}}{T_m} \right)$$

K_1	0,3855 K/mmHg		
V_mr	1,946498 dcm		
Y	1 Gasmåler Faktor		
P_bar	765,4362 mmHg	P_bar	1020,5 mBar
Delta_H	0 mmVS		
T_m	295,0389 K	T_Gasmåler	22,0389 °C

$$V_{mr(std)} = 0,3855 \times 1,9465 \times 1 \times \left(\frac{765,4 + \frac{0}{13,6}}{295} \right)$$

$$V_{mr(std)} = 1,94674 \text{ dscm}$$

$$\text{Equation (14)} \quad C_r = K_2 * \frac{m_r}{V_{m_r(std)}}$$

K_2	0,001 g/mg
m_r	0 mg
V_m_r(std)	1,946741 dscm

$$C_r = 0,001 \times \frac{0}{1,94674}$$

$$C_r = 0 \text{ g/dscm}$$

Proportional Rate first 10 minutes

E2515

$$\text{Equation (16)} \quad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	292,05 min
V_{mi}	0,073798 l
V_s	5,99 m/s
T_m	298,887 K
T_{si}	310,2593 K
V_m	2,13 l
V_{si}	6,11 m/s
T_s	300,5107 K
T_{mi}	299,9863 K

$$PR = \frac{292,05}{10} \times \left(\frac{0,07}{2} \times \frac{5,99}{6,11} \times \frac{298,9}{300,5} \times \frac{310}{300} \right) \times 100$$

$$PR = 102,273 \text{ -}$$

Notation and units**E2780**

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
	FM_CPn	average fuel moisture of test fuel piece n in fuel crib, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crib, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m ³
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m ³
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crib excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimensionless (assigned a value of 0.99)
	ΔP_{avg}	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m ²	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m ³ /min	Leakage rate observed during the post-test leakcheck
	L_a	m ³ /min	Maximum acceptable leakage rate for either a orestest og post-test leak-check, equal to 0.0003 m ³ /min
	θ	Min	Total sampling time
	V_mc	-	$V_m - (L_p - L_a) * \theta$
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Concentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute average dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 18

Title: HF1 logger data

Pages total: 25, excl this cover page

Datotid	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C]	Filter-4-R - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
13:13:41	21,42	26,79	26,84	28,52	23,79
13:14:11	21,40	26,92	26,78	28,55	23,87
13:14:41	21,60	26,74	26,88	28,63	23,88
13:15:11	21,61	26,79	26,79	28,74	23,85
13:15:41	21,47	26,77	26,88	28,78	23,81
13:16:11	21,52	26,88	26,81	28,73	23,87
13:16:41	21,59	26,93	26,81	28,95	23,97
13:17:11	21,66	26,88	26,92	28,84	23,91
13:17:41	21,62	26,99	26,87	28,94	24,02
13:18:11	21,54	27,03	26,81	28,88	23,86
13:18:41	21,51	26,96	26,93	28,77	23,89
13:19:11	21,55	26,98	26,94	28,76	23,98
13:19:41	21,76	27,03	26,91	28,73	23,94
13:20:11	21,82	27,19	26,99	28,74	23,91
13:20:41	21,53	27,19	26,83	28,70	23,81
13:21:11	21,57	27,13	26,88	28,52	23,81
13:21:41	21,59	27,27	26,79	28,79	23,95
13:22:11	21,52	27,23	26,86	28,63	23,81
13:22:41	21,50	27,24	26,98	28,74	23,92
13:23:11	21,61	27,28	27,03	28,83	23,93
13:23:41	21,65	27,41	26,97	28,92	23,89
13:24:11	21,72	27,39	27,20	28,89	23,78
13:24:41	21,78	27,44	27,33	28,85	23,87
13:25:11	21,79	27,41	27,42	28,76	23,93
13:25:41	21,95	27,56	27,41	28,86	23,96
13:26:11	21,92	27,67	27,37	28,85	23,94
13:26:41	21,72	27,63	27,48	28,67	23,85
13:27:11	21,87	27,74	27,43	28,71	23,97
13:27:41	21,88	27,79	27,41	28,74	23,85
13:28:11	21,73	27,77	27,50	28,82	23,83
13:28:41	21,80	27,70	27,61	28,78	23,86
13:29:11	21,94	27,82	27,64	28,77	23,94
13:29:41	21,84	28,02	27,66	28,96	23,96
13:30:11	21,71	28,18	27,78	28,91	23,88
13:30:41	21,84	28,33	27,88	28,90	23,87
13:31:11	21,82	28,37	28,07	28,82	23,89
13:31:41	22,02	28,53	28,13	28,96	23,96
13:32:11	22,16	28,58	28,23	28,87	23,90
13:32:41	21,84	28,72	28,27	28,86	23,94
13:33:11	21,87	28,81	28,31	28,80	23,92
13:33:41	21,92	28,92	28,33	28,63	23,92
13:34:11	21,81	28,92	28,49	28,55	23,97
13:34:41	21,74	29,03	28,52	28,52	24,02

13:35:11	21,98	29,20	28,68	28,57	23,99
13:35:41	22,11	29,26	28,65	28,75	23,97
13:36:11	22,04	29,25	28,67	28,78	23,99
13:36:41	22,02	29,28	28,67	28,84	23,97
13:37:11	22,06	29,30	28,67	28,89	23,95
13:37:41	21,70	29,30	28,64	28,91	23,91
13:38:11	21,62	29,30	28,64	28,89	23,92
13:38:41	21,82	29,25	28,64	28,84	23,93
13:39:11	21,84	29,32	28,71	28,76	23,95
13:39:41	21,99	30,18	29,43	28,81	23,95
13:40:11	22,36	30,38	29,62	28,77	24,01
13:40:41	22,05	30,08	29,37	28,69	23,97
13:41:11	22,11	29,87	29,18	28,62	23,96
13:41:41	21,86	29,71	29,07	28,49	23,93
13:42:11	21,95	29,59	28,98	28,42	23,97
13:42:41	21,77	29,61	28,98	28,40	23,96
13:43:11	22,25	29,51	28,92	28,29	24,04
13:43:41	21,89	29,44	28,87	28,17	24,02
13:44:11	21,96	29,37	28,76	28,06	24,03
13:44:41	21,96	29,32	28,72	28,00	23,99
13:45:11	22,02	29,33	28,71	28,14	23,99
13:45:41	21,96	29,23	28,79	28,23	24,01
13:46:11	22,05	29,12	28,74	28,30	24,04
13:46:41	21,94	29,08	28,58	28,40	24,07
13:47:11	22,11	29,13	28,54	28,69	24,04
13:47:41	22,03	29,09	28,62	28,87	23,95
13:48:12	22,32	29,02	28,53	28,96	24,03
13:48:42	22,33	29,00	28,44	28,99	24,00
13:49:12	22,04	28,96	28,39	29,02	23,99
13:49:42	22,09	28,96	28,43	29,12	24,00
13:50:12	21,85	28,90	28,59	29,09	24,01
13:50:42	21,92	28,88	28,57	29,10	24,09
13:51:12	21,92	28,88	28,48	29,09	24,09
13:51:42	21,94	28,87	28,35	29,01	24,03
13:52:12	22,02	28,85	28,33	28,96	24,05
13:52:42	22,09	28,82	28,31	28,90	24,02
13:53:12	21,88	28,87	28,35	28,86	23,99
13:53:42	22,03	28,83	28,36	28,79	24,05
13:54:12	22,08	28,76	28,47	28,67	24,11
13:54:42	22,02	28,83	28,33	28,71	24,18
13:55:12	22,19	28,79	28,36	28,79	24,05
13:55:42	22,28	28,73	28,47	28,77	24,09
13:56:12	22,38	28,86	28,36	28,90	24,20
13:56:42	22,19	28,76	28,53	28,90	24,21
13:57:12	22,13	28,83	28,51	29,04	24,29
13:57:42	21,99	28,86	28,44	28,98	24,22
13:58:12	21,85	28,81	28,56	28,96	24,29
13:58:42	21,95	29,02	28,49	29,08	24,33

13:59:12	21,93	28,90	28,60	28,96	24,33
13:59:42	21,86	28,97	28,48	28,99	24,43
14:00:12	22,03	28,95	28,50	28,94	24,33
14:00:42	22,07	29,00	28,51	28,88	24,34
14:01:12	21,91	29,07	28,67	28,90	24,35
14:01:42	22,24	29,00	28,67	28,78	24,42
14:02:12	22,17	28,92	28,69	28,66	24,40
14:02:42	22,04	28,94	28,71	28,67	24,47
14:03:12	22,29	28,94	28,74	28,75	24,50
14:03:42	22,26	29,05	28,83	28,88	24,53
14:04:12	22,14	28,99	28,77	28,86	24,59
14:04:42	22,25	29,02	28,79	28,92	24,58
14:05:12	22,07	29,03	28,81	29,00	24,61
14:05:42	22,17	29,20	28,76	29,05	24,54
14:06:12	22,31	29,19	28,78	29,01	24,58
14:06:42	22,09	29,12	28,80	28,96	24,61
14:07:12	22,19	29,08	28,91	28,94	24,64
14:07:42	22,62	29,16	28,79	28,95	24,65
14:08:12	22,38	29,28	28,88	29,00	24,55
14:08:42	22,45	29,25	28,91	28,92	24,65
14:09:12	22,36	29,14	28,95	28,68	24,64
14:09:42	22,13	29,19	28,88	28,63	24,73
14:10:12	22,36	29,35	28,98	28,80	24,68
14:10:42	22,37	29,28	29,03	28,69	24,68
14:11:12	22,21	29,24	29,06	28,74	24,78
14:11:42	22,28	29,31	29,03	28,91	24,77
14:12:12	22,40	29,29	29,01	28,84	24,72
14:12:42	22,29	29,40	29,05	29,04	24,79
14:13:12	22,17	29,37	28,92	29,05	24,78
14:13:42	22,41	29,24	23,97	27,83	24,79
14:14:12	22,29	29,31	20,85	28,09	24,81
14:14:42	22,47	29,36	20,51	28,41	24,83
14:15:12	22,42	29,27	20,35	28,65	24,89
14:15:42	22,53	29,36	20,30	28,86	24,87
14:16:12	22,61	29,44	20,35	29,06	24,81
14:16:42	22,60	29,45	20,75	29,22	24,82
14:17:12	22,27	29,42	20,19	29,23	24,80
14:17:42	22,07	29,42	20,19	29,27	24,76
14:18:12	22,14	29,46	20,35	29,32	24,73
14:18:42	22,11	29,42	20,42	29,28	24,84
14:19:12	22,12	29,49	20,26	29,46	24,84
14:19:42	21,95	29,39	20,38	29,41	24,73
14:20:12	21,92	29,55	20,16	29,61	24,73
14:20:42	22,07	29,42	20,57	29,61	24,70
14:21:12	22,00	29,40	20,67	29,62	24,73
14:21:42	22,05	29,43	20,29	29,71	24,66
14:22:12	21,84	29,51	20,81	29,80	24,60
14:22:42	21,99	29,51	20,44	29,93	24,67

14:23:12	22,10	29,36	20,44	29,84	24,60
14:23:42	21,96	29,43	20,52	29,90	24,65
14:24:12	21,91	29,47	20,30	29,95	24,53
14:24:42	22,64	29,48	20,61	29,95	24,59
14:25:12	22,47	29,38	20,68	30,01	24,56
14:25:42	22,43	29,25	20,68	29,90	24,53
14:26:12	22,60	29,40	20,52	29,96	24,57
14:26:42	22,43	29,41	20,44	29,99	24,54
14:27:12	22,59	29,25	20,46	29,88	24,48
14:27:42	22,57	29,30	20,59	29,94	24,52
14:28:12	22,20	29,38	20,75	30,04	24,39
14:28:42	22,58	29,26	20,84	29,91	24,45
14:29:12	22,41	29,21	20,71	29,85	24,53
14:29:42	22,20	29,26	20,87	29,93	24,44
14:30:12	22,37	29,14	21,03	29,84	24,34
14:30:42	22,70	29,25	20,85	30,06	24,43
14:31:12	22,52	29,13	21,19	29,96	24,39
14:31:42	22,83	29,20	20,84	30,06	24,40
14:32:12	22,86	29,11	20,87	30,08	24,32
14:32:42	22,42	29,11	20,83	30,05	24,35
14:33:12	22,76	29,22	20,88	30,20	24,40
14:33:42	22,89	29,11	21,16	30,20	24,31
14:34:12	22,61	29,05	20,85	30,16	24,30
14:34:42	22,16	29,06	21,17	30,10	24,31
14:35:12	22,05	29,11	21,05	30,21	24,24
14:35:42	22,31	28,96	20,99	30,02	24,31
14:36:12	22,68	29,03	20,97	30,12	24,32
14:36:42	22,32	28,96	21,01	30,09	24,18
14:37:12	21,97	28,90	21,05	29,98	24,21
14:37:42	22,06	28,84	21,30	29,92	24,26
14:38:12	22,00	28,91	22,17	29,92	24,30
14:38:42	22,13	28,94	27,46	29,94	24,32
14:39:12	21,87	28,94	28,00	29,89	24,28
14:39:42	21,80	28,93	28,44	29,92	24,25
14:40:12	22,81	28,79	28,66	29,76	24,25
14:40:42	22,63	28,99	28,80	29,90	24,29
14:41:12	22,90	28,98	28,89	30,00	24,29
14:41:42	22,98	28,84	29,05	29,93	24,26
14:42:12	22,58	28,94	28,98	30,05	24,34
14:42:42	22,44	28,77	28,95	29,93	24,26
14:43:12	22,06	28,90	28,76	30,04	24,30
14:43:42	22,13	28,88	28,92	30,11	24,21
14:44:12	22,06	28,87	28,73	30,02	24,33
14:44:42	22,07	28,98	28,59	30,11	24,35
14:45:12	22,03	28,84	28,63	30,05	24,25
14:45:42	22,13	28,78	28,38	29,97	24,32
14:46:12	22,12	28,82	28,37	30,09	24,29
14:46:42	22,45	28,78	28,39	30,02	24,26

14:47:12	21,95	28,81	28,43	30,05	24,33
14:47:42	22,12	28,91	28,43	30,03	24,35
14:48:12	22,35	28,91	28,52	30,07	24,29
14:48:42	22,31	28,91	28,52	30,01	24,29
14:49:12	21,98	28,81	28,58	29,88	24,30
14:49:42	21,92	28,82	28,52	29,88	24,33
14:50:12	21,96	28,95	28,56	29,89	24,30
14:50:42	21,96	28,95	28,48	29,84	24,35
14:51:12	22,06	28,92	28,42	29,75	24,32
14:51:42	21,81	28,87	28,32	29,67	24,33
14:52:12	21,61	28,83	28,34	29,60	24,32
14:52:42	21,57	27,65	28,40	29,51	24,29
14:53:12	21,12	27,34	28,52	28,85	24,27
14:53:42	21,44	28,18	28,52	28,57	24,31

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
18,49	20,82	26,75	26,25	22,85	6,71
18,16	20,48	26,76	26,31	22,71	6,69
18,04	20,15	26,81	26,34	22,78	6,70
17,87	19,88	26,81	26,35	22,84	6,70
17,74	19,61	26,79	26,33	22,81	6,68
17,59	19,44	26,77	26,30	22,80	6,68
17,40	19,38	26,77	26,36	22,68	6,67
17,45	19,16	26,80	26,35	22,81	6,63
17,25	19,12	26,76	26,39	22,66	6,76
17,32	18,86	26,79	26,35	22,82	6,70
17,22	18,80	26,75	26,37	22,72	6,70
17,05	18,78	26,70	26,38	22,62	6,68
17,01	18,67	26,71	26,35	22,68	6,67
16,99	18,56	26,69	26,32	22,70	6,65
17,02	18,41	26,69	26,29	22,76	6,61
16,95	18,37	26,66	26,26	22,72	6,66
16,73	18,42	26,65	26,31	22,58	6,70
16,83	18,21	26,60	26,24	22,70	6,71
16,65	18,29	26,60	26,31	22,59	6,66
16,60	18,26	26,57	26,29	22,53	6,65
16,60	18,17	26,57	26,24	22,65	6,61
16,66	18,04	26,58	26,21	22,72	6,60
16,59	18,06	26,56	26,22	22,68	6,60
16,49	18,09	26,57	26,24	22,64	6,58
16,41	18,09	26,55	26,23	22,59	6,56
16,50	17,98	26,56	26,20	22,68	6,58
16,53	17,90	26,56	26,21	22,71	6,56
16,41	17,99	26,53	26,23	22,56	6,53
16,43	17,86	26,53	26,19	22,63	6,57
16,43	17,80	26,51	26,16	22,67	6,67
16,37	17,77	26,48	26,12	22,66	6,69
16,29	17,78	26,47	26,14	22,61	6,68
16,20	17,80	26,47	26,18	22,51	6,66
16,32	17,67	26,46	26,11	22,64	6,61
16,22	17,73	26,45	26,10	22,58	6,76
16,18	17,71	26,44	26,11	22,55	6,73
16,11	17,73	26,40	26,14	22,51	6,72
16,22	17,63	26,40	26,09	22,62	6,70
16,17	17,67	26,38	26,11	22,58	6,67
16,17	17,59	26,39	26,09	22,61	6,65
16,16	17,59	26,39	26,09	22,62	6,64
16,07	17,63	26,41	26,10	22,54	6,63
16,04	17,63	26,33	26,10	22,55	6,59

16,04	17,65	26,35	26,10	22,49	6,60
16,02	17,64	26,28	26,08	22,57	6,57
16,11	17,62	26,31	26,08	22,58	6,55
16,10	17,63	26,32	26,08	22,58	6,53
16,09	17,61	26,32	26,06	22,61	6,51
16,13	17,55	26,37	26,05	22,61	6,50
16,14	17,55	26,37	26,04	22,60	6,47
16,10	17,57	26,35	26,05	22,59	6,45
16,04	17,60	26,31	26,05	22,55	6,44
16,05	17,60	26,29	26,05	22,56	6,40
16,15	17,63	26,33	26,04	22,64	6,34
16,16	17,60	26,38	26,06	22,62	6,67
16,13	17,54	26,36	26,04	22,63	6,68
16,10	17,55	26,36	26,05	22,60	6,68
16,05	17,56	26,32	26,05	22,56	6,65
16,05	17,52	26,34	26,04	22,57	6,67
16,10	17,59	26,35	26,07	22,62	6,66
16,07	17,60	26,32	26,08	22,60	6,66
16,06	17,58	26,31	26,06	22,60	6,64
16,03	17,51	26,33	26,07	22,58	6,64
16,04	17,47	26,31	26,05	22,60	6,64
16,11	17,46	26,34	26,05	22,67	6,64
16,08	17,46	26,31	26,03	22,67	6,64
15,99	17,51	26,33	26,04	22,61	6,65
15,96	17,45	26,33	26,08	22,57	6,62
16,02	17,35	26,30	26,02	22,65	6,65
16,04	17,41	26,34	26,03	22,70	6,61
16,01	17,39	26,34	26,04	22,72	6,63
16,01	17,37	26,35	26,05	22,67	6,64
15,94	17,37	26,34	26,05	22,65	6,62
15,97	17,35	26,32	26,01	22,67	6,59
15,93	17,44	26,32	26,06	22,64	6,62
15,91	17,44	26,34	26,07	22,68	6,63
15,94	17,37	26,36	26,04	22,73	6,62
15,91	17,36	26,34	26,06	22,68	6,63
15,89	17,37	26,34	26,04	22,67	6,60
15,90	17,31	26,32	26,04	22,69	6,59
15,91	17,36	26,33	26,06	22,69	6,60
15,90	17,39	26,37	26,08	22,71	6,63
15,80	17,44	26,32	26,08	22,66	6,62
15,87	17,33	26,34	26,06	22,73	6,61
15,88	17,31	26,33	26,03	22,72	6,63
15,79	17,42	26,32	26,04	22,63	6,62
15,88	17,34	26,40	26,09	22,73	6,62
15,79	17,44	26,35	26,09	22,66	6,61
15,87	17,34	26,36	26,09	22,76	6,62
15,88	17,32	26,35	26,10	22,70	6,59
15,83	17,34	26,32	26,08	22,67	6,60

15,93	17,29	26,41	26,11	22,77	6,60
15,84	17,37	26,39	26,13	22,70	6,60
15,91	17,24	26,40	26,11	22,81	6,60
15,92	17,22	26,39	26,09	22,80	6,59
15,90	17,19	26,39	26,09	22,79	6,58
15,94	17,23	26,40	26,07	22,83	6,57
15,91	17,24	26,42	26,10	22,82	6,58
15,77	17,28	26,41	26,14	22,75	6,56
15,72	17,24	26,40	26,12	22,76	6,58
15,68	17,22	26,36	26,13	22,76	6,59
15,74	17,25	26,42	26,14	22,82	6,56
15,71	17,23	26,43	26,20	22,81	6,55
15,70	17,23	26,40	26,16	22,80	6,56
15,74	17,14	26,42	26,11	22,87	6,59
15,85	17,12	26,45	26,16	22,89	6,57
15,76	17,18	26,43	26,19	22,82	6,57
15,70	17,19	26,44	26,20	22,85	6,58
15,66	17,19	26,42	26,16	22,86	6,55
15,68	17,08	26,43	26,14	22,95	6,57
15,75	17,13	26,47	26,16	22,96	6,55
15,76	17,14	26,45	26,14	22,96	6,57
15,65	17,23	26,46	26,20	22,91	6,56
15,66	17,17	26,46	26,20	22,90	6,54
15,79	17,15	26,48	26,18	23,01	6,55
15,70	17,25	26,48	26,22	22,92	6,56
15,70	17,24	26,49	26,23	22,95	6,56
15,78	17,17	26,46	26,18	23,00	6,53
15,72	17,26	26,49	26,23	22,95	6,72
15,85	17,19	26,49	26,20	23,02	6,73
15,84	17,24	26,48	26,19	23,02	6,72
15,80	17,14	26,51	26,20	23,02	6,71
15,80	17,13	26,52	26,21	23,00	6,70
15,79	17,12	26,52	26,25	22,95	6,70
15,79	17,05	26,54	26,23	23,01	6,71
15,82	16,94	26,54	26,23	23,04	6,70
15,87	16,98	26,57	26,26	23,05	6,69
15,89	17,01	26,54	26,23	23,06	6,68
15,87	17,02	26,55	26,24	23,08	6,69
15,83	17,02	26,54	26,22	23,07	6,67
15,80	17,16	26,55	26,29	23,04	6,69
15,70	17,17	26,57	26,31	22,97	6,68
15,76	17,12	26,53	26,26	23,05	6,66
15,67	17,18	26,58	26,32	22,98	6,66
15,73	17,16	26,57	26,29	23,05	6,67
15,66	17,23	26,55	26,29	22,99	6,65
15,63	17,23	26,58	26,31	23,00	6,64
15,70	17,25	26,57	26,28	22,99	6,65
15,70	17,37	26,59	26,31	22,97	6,63

15,76	17,34	26,53	26,26	23,01	6,63
15,68	17,46	26,55	26,29	22,95	6,63
15,75	17,40	26,58	26,26	23,00	6,65
15,77	17,47	26,59	26,29	22,95	6,60
15,78	17,48	26,55	26,27	22,92	6,70
15,76	17,46	26,52	26,22	22,94	6,66
15,66	17,52	26,53	26,26	22,86	6,68
15,70	17,47	26,57	26,27	22,86	6,67
15,74	17,41	26,51	26,25	22,87	6,65
15,68	17,48	26,48	26,25	22,78	6,64
15,73	17,37	26,48	26,20	22,87	6,65
15,79	17,40	26,48	26,20	22,86	6,64
15,70	17,46	26,48	26,22	22,77	6,64
15,68	17,45	26,48	26,25	22,76	6,68
15,78	17,34	26,44	26,18	22,81	6,67
15,70	17,44	26,46	26,21	22,74	6,69
15,77	17,39	26,44	26,17	22,79	6,67
15,65	17,43	26,45	26,21	22,69	6,66
15,72	17,32	26,43	26,16	22,73	6,67
15,68	17,33	26,39	26,16	22,72	6,69
15,56	17,37	26,43	26,19	22,65	6,65
15,69	17,30	26,42	26,14	22,75	6,67
15,70	17,30	26,41	26,13	22,75	6,65
15,64	17,33	26,39	26,13	22,70	6,65
15,61	17,31	26,40	26,14	22,66	6,66
15,70	17,33	26,39	26,13	22,69	6,66
15,61	17,39	26,43	26,19	22,62	6,63
15,70	17,29	26,39	26,12	22,70	6,63
15,69	17,30	26,38	26,08	22,71	6,63
15,64	17,35	26,36	26,11	22,65	6,71
15,60	17,42	26,38	26,12	22,64	6,71
15,66	17,46	26,39	26,17	22,64	6,69
15,71	17,43	26,42	26,17	22,66	6,72
15,73	17,41	26,39	26,13	22,67	6,69
15,79	17,40	26,35	26,08	22,71	6,71
15,69	17,47	26,37	26,14	22,65	6,70
15,81	17,46	26,41	26,16	22,72	6,69
15,88	17,42	26,40	26,12	22,76	6,68
15,81	17,51	26,39	26,14	22,69	6,68
15,87	17,46	26,36	26,12	22,74	6,69
15,76	17,52	26,41	26,16	22,66	6,67
15,85	17,45	26,38	26,12	22,75	6,68
15,85	17,54	26,41	26,15	22,75	6,69
15,80	17,56	26,44	26,18	22,70	6,65
15,90	17,50	26,42	26,17	22,75	6,68
15,82	17,57	26,41	26,15	22,69	6,67
15,81	17,56	26,43	26,17	22,71	6,64
15,89	17,54	26,39	26,11	22,79	6,63

15,86	17,60	26,45	26,19	22,76	6,64
15,86	17,61	26,46	26,17	22,77	6,64
15,91	17,52	26,46	26,15	22,82	6,71
15,94	17,52	26,44	26,14	22,83	6,72
15,91	17,54	26,49	26,17	22,80	6,71
15,84	17,58	26,43	26,17	22,72	6,70
15,89	17,53	26,43	26,14	22,77	6,70
15,94	17,57	26,51	26,21	22,77	6,71
15,97	17,53	26,51	26,18	22,81	6,71
15,93	17,54	26,49	26,20	22,76	6,70
15,91	17,54	26,51	26,21	22,77	6,69
15,93	17,51	26,48	26,20	22,78	6,70
15,90	17,44	26,47	26,19	22,77	7,85
15,79	17,53	26,45	26,19	22,68	7,78

Flow-D - [ln/min]	NS-Røgtemp - Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]	
13	24	27	28	29	30
Split train flow rate	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
6,73	21,77	23,14	25,32	24,27	25,40
6,75	25,92	23,22	25,31	24,26	25,41
6,75	24,83	23,72	25,33	24,29	25,48
6,77	26,34	24,50	25,33	24,36	25,59
6,76	27,10	25,39	25,34	24,40	25,82
6,76	28,78	26,61	25,35	24,62	26,07
6,74	31,11	28,02	25,35	24,84	26,44
6,73	31,85	29,35	25,40	25,08	26,96
6,72	38,16	31,38	25,42	25,38	27,57
6,67	48,07	34,14	25,47	25,80	28,34
6,68	54,11	36,70	25,54	26,31	29,39
6,66	64,40	40,05	25,61	27,03	30,57
6,65	72,72	44,10	25,71	27,94	31,97
6,63	84,13	49,25	25,83	28,94	33,60
6,60	93,53	55,06	25,97	30,09	35,55
6,59	89,16	59,78	26,14	31,53	37,66
6,68	94,15	64,73	26,36	32,94	39,83
6,68	105,25	70,44	26,64	34,14	42,20
6,66	125,45	78,31	26,94	35,35	44,78
6,65	134,69	87,91	27,30	36,59	47,80
6,62	137,70	97,54	27,68	38,01	51,13
6,60	142,90	107,91	28,15	39,51	54,64
6,58	140,38	117,32	28,72	41,20	58,19
6,54	140,84	124,85	29,35	43,04	61,73
6,56	136,40	131,19	30,04	45,00	65,16
6,56	138,91	137,07	30,84	46,96	68,41
6,55	147,19	143,45	31,67	48,86	71,44
6,53	154,35	151,08	32,57	50,81	74,35
6,65	154,02	158,01	33,50	52,87	77,29
6,66	156,08	164,59	34,45	54,93	80,22
6,65	158,18	171,37	35,43	57,04	83,17
6,64	161,54	177,96	36,43	59,14	86,10
6,63	172,56	185,47	37,51	61,24	89,07
6,62	183,45	195,79	38,68	63,41	92,13
6,59	189,42	207,16	39,90	65,70	95,40
6,71	184,93	216,44	41,24	68,09	99,00
6,68	188,44	225,59	42,61	70,60	102,70
6,68	191,92	234,75	44,14	73,16	106,57
6,68	196,70	244,43	45,87	75,74	110,59
6,76	205,11	254,55	47,88	78,38	114,78
6,73	204,67	263,68	50,18	81,05	119,15
6,73	209,20	271,92	52,67	83,76	123,78
6,70	210,65	280,71	54,97	86,64	128,46

6,69	210,40	288,38	57,16	89,56	133,31
6,65	210,58	295,24	59,04	92,65	138,15
6,67	214,11	301,99	60,87	95,82	142,96
6,65	213,20	308,71	62,71	98,99	147,71
6,62	211,35	313,92	64,51	102,21	152,27
6,58	212,38	317,91	66,15	105,52	156,69
6,55	209,31	320,46	67,61	108,87	160,88
6,53	206,76	322,11	69,22	112,27	164,91
6,54	202,56	322,61	70,89	115,66	168,71
6,51	199,13	321,70	72,24	119,13	172,23
6,45	185,30	314,54	73,38	123,04	175,02
6,65	183,71	309,93	75,16	126,73	177,61
6,73	180,91	306,37	77,15	129,86	179,81
6,72	180,47	302,56	79,29	132,62	181,70
6,72	180,73	299,18	81,52	135,03	183,32
6,69	185,45	296,84	83,47	137,10	184,68
6,71	188,17	295,16	85,21	139,08	185,95
6,70	191,16	294,30	86,82	140,77	187,12
6,68	192,03	293,82	88,14	142,49	188,26
6,72	190,35	293,15	89,97	143,99	189,40
6,69	188,26	292,19	91,61	145,44	190,48
6,69	188,59	291,02	93,19	146,76	191,55
6,70	191,03	290,54	94,57	148,05	192,47
6,70	194,25	290,72	95,90	149,27	193,30
6,69	196,02	291,64	97,11	150,36	194,23
6,70	197,76	292,84	98,31	151,42	195,16
6,68	198,86	294,06	99,37	152,61	196,15
6,69	202,94	295,71	100,40	153,68	197,16
6,69	201,80	296,98	101,38	154,62	198,26
6,70	199,65	298,13	102,34	155,69	199,42
6,66	197,70	298,40	103,22	156,70	200,58
6,67	195,21	297,87	104,06	157,83	201,69
6,66	193,79	297,38	104,86	158,89	202,84
6,68	192,86	296,76	105,67	159,81	203,81
6,68	193,41	295,79	106,46	160,68	204,80
6,67	192,30	294,91	107,25	161,60	205,63
6,68	191,06	294,63	108,03	162,40	206,35
6,67	193,07	294,23	108,80	163,22	207,10
6,66	195,30	294,24	109,48	164,02	207,77
6,65	195,11	294,09	110,18	164,88	208,52
6,65	196,24	294,47	110,86	165,59	209,31
6,66	198,92	294,86	111,56	166,31	209,99
6,67	200,08	295,90	112,22	167,10	210,64
6,65	200,26	296,91	112,88	167,78	211,33
6,65	200,16	298,26	113,56	168,67	212,21
6,67	201,76	299,54	114,24	169,51	213,05
6,65	201,48	301,06	114,92	170,38	214,23
6,65	199,23	301,94	115,58	171,22	215,20

6,65	199,36	303,25	116,28	171,97	216,21
6,63	205,06	304,66	116,93	172,72	217,25
6,63	209,01	306,32	117,64	173,54	218,28
6,64	209,50	307,98	118,33	174,42	219,39
6,64	209,01	309,22	119,06	175,34	220,61
6,63	209,50	310,05	119,75	176,20	221,79
6,63	210,26	311,16	120,51	177,13	222,88
6,62	209,66	311,77	121,23	178,10	224,07
6,65	210,86	312,97	121,97	178,96	225,18
6,63	212,38	314,07	122,66	179,85	226,34
6,61	217,55	314,86	123,42	180,72	227,44
6,63	218,23	315,70	124,20	181,58	228,58
6,61	219,12	316,77	124,95	182,43	229,65
6,61	219,42	317,64	125,75	183,26	230,76
6,62	220,20	318,21	126,53	184,04	231,84
6,58	220,54	319,39	127,27	184,82	232,85
6,61	221,44	320,40	128,06	185,65	233,84
6,60	220,72	321,05	128,81	186,52	234,76
6,59	222,03	321,98	129,62	187,29	235,85
6,59	222,41	323,17	130,44	188,12	236,90
6,59	223,47	324,42	131,22	188,98	237,84
6,57	224,45	325,69	131,99	189,85	238,75
6,57	225,41	327,16	132,79	190,61	239,74
6,57	225,58	328,47	133,61	191,42	240,78
6,58	226,07	329,82	134,44	192,26	241,81
6,57	226,65	331,43	135,29	193,09	242,83
6,56	226,67	333,13	136,11	193,89	243,86
6,69	227,79	334,64	136,98	194,64	244,80
6,69	228,63	336,08	137,82	195,54	245,94
8,65	229,41	337,80	138,66	196,29	246,87
7,74	229,06	339,54	139,51	197,12	247,88
7,76	229,58	341,20	140,42	198,02	248,94
7,76	229,16	342,46	141,33	198,83	249,86
7,77	231,40	343,63	142,23	199,76	250,82
7,75	232,44	345,46	143,10	200,57	251,73
6,77	232,38	347,19	144,01	201,40	252,49
6,78	233,81	349,22	144,97	202,28	253,50
6,78	233,08	351,48	145,91	203,24	254,51
6,77	234,77	353,27	146,82	204,16	255,35
6,75	234,76	355,45	147,73	205,05	256,08
6,73	236,88	357,35	148,67	206,00	257,14
6,71	237,59	359,63	149,64	206,89	257,96
6,69	237,81	361,92	150,60	207,89	258,89
6,68	237,78	364,15	151,51	208,88	259,84
6,64	236,44	366,36	152,48	209,84	260,68
6,64	237,84	367,76	153,45	210,76	261,63
6,62	239,25	369,40	154,44	211,66	262,41
6,62	238,03	370,65	155,43	212,63	263,23

6,62	239,06	372,32	156,42	213,47	264,11
6,63	239,24	373,89	157,35	214,47	264,92
6,61	241,22	375,37	158,38	215,23	265,63
6,61	238,69	376,32	159,39	216,12	266,53
6,74	238,03	376,71	160,39	217,09	267,37
6,73	236,97	376,65	161,40	217,98	268,04
6,70	235,70	375,80	162,40	218,93	268,68
6,70	234,52	374,97	163,50	219,77	269,32
6,70	232,50	373,93	164,57	220,62	269,82
6,69	231,97	373,08	165,65	221,43	270,16
6,66	231,39	371,51	166,75	222,30	270,54
6,66	230,76	369,91	167,84	223,06	270,76
6,66	230,86	368,29	168,90	223,83	270,83
6,72	229,84	366,53	170,10	224,42	270,99
6,74	228,32	364,96	171,24	225,09	271,23
6,71	228,07	363,91	172,40	225,63	271,37
6,69	228,48	362,84	173,55	226,24	271,40
6,69	226,82	361,42	174,69	227,04	271,40
6,70	225,22	360,22	175,96	227,65	271,58
6,69	224,25	358,86	177,16	228,26	271,53
6,69	223,16	357,28	178,37	228,79	271,52
6,67	223,36	356,13	179,59	229,33	271,60
6,65	223,58	354,62	180,76	229,80	271,61
6,65	221,91	353,17	182,01	230,28	271,73
6,64	220,28	351,79	183,28	230,75	271,78
6,63	219,81	350,21	184,47	231,23	271,77
6,64	217,63	348,35	185,71	231,55	271,62
6,62	216,97	346,63	186,93	231,92	271,83
6,62	216,18	344,89	188,17	232,26	271,64
6,90	216,49	343,08	189,45	232,63	271,55
6,70	215,80	341,23	190,70	233,02	271,47
6,72	215,37	339,55	191,94	233,24	271,41
6,72	214,78	338,28	193,19	233,49	271,36
6,70	215,67	336,84	194,42	233,65	271,24
6,71	215,17	336,04	195,69	233,94	271,14
6,70	213,52	335,16	197,00	234,06	270,87
6,67	214,57	334,65	198,29	233,98	270,92
6,67	213,50	334,04	199,53	234,06	270,86
6,67	213,58	333,57	200,79	234,32	270,91
6,66	213,57	333,10	202,15	234,42	270,95
6,66	214,23	332,69	203,47	234,48	270,99
6,67	213,41	332,30	204,86	234,70	271,22
6,65	213,05	331,74	206,14	234,85	271,28
6,68	212,57	331,20	207,48	235,00	271,42
6,66	211,87	330,44	208,80	235,05	271,53
6,64	212,32	329,94	210,15	235,13	271,33
6,64	211,89	329,28	211,45	235,33	271,36
6,62	210,79	328,92	212,80	235,59	271,34

6,64	209,48	328,42	214,03	235,85	271,11
6,61	209,07	327,37	215,38	236,03	270,89
6,73	207,00	326,38	216,66	236,24	270,77
6,74	206,76	324,98	217,90	236,63	270,54
6,71	205,33	323,67	219,17	236,85	270,32
6,73	205,35	322,41	220,39	237,05	269,76
6,72	204,61	320,97	221,65	237,28	269,26
6,72	203,60	319,92	222,79	237,54	268,84
6,72	202,83	318,65	223,93	237,77	268,13
6,72	202,48	317,76	225,04	238,02	267,62
6,71	202,39	316,69	226,16	238,06	267,20
6,70	201,95	315,61	227,19	238,25	266,64
6,70	201,22	314,63	228,20	238,33	266,12
8,21	200,10	313,50	229,19	238,38	265,48

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
Bottom					
23,40	25,06	0,25	27,30	41,37	1,65
23,41	25,11	0,62	27,32	41,22	1,41
23,40	25,08	1,32	26,65	40,50	1,41
23,36	25,05	1,02	27,30	41,79	1,41
23,35	25,18	1,33	28,26	44,18	1,40
23,37	25,23	1,69	27,10	42,18	1,40
23,39	25,33	1,70	27,68	41,96	1,40
23,35	25,35	2,38	26,81	41,80	1,39
23,40	25,39	3,93	28,10	42,70	1,39
23,33	25,38	4,57	28,12	43,96	1,38
23,37	25,36	6,06	27,82	41,88	1,37
23,39	25,39	6,97	27,21	42,47	1,36
23,38	25,57	7,91	26,82	42,21	1,35
23,36	25,73	9,38	28,08	41,84	1,34
23,37	25,95	9,59	28,38	41,62	1,32
23,39	26,14	8,94	28,25	42,39	1,31
23,46	26,34	10,25	27,09	42,64	1,30
23,43	26,62	11,35	27,03	41,46	1,28
23,55	26,98	12,65	28,13	42,57	1,25
23,63	27,40	13,00	28,57	42,90	1,22
23,66	27,81	13,58	26,95	42,55	1,20
23,74	28,22	13,65	28,06	42,78	1,17
23,84	28,53	13,75	27,82	41,87	1,14
23,99	28,82	13,32	28,05	42,77	1,11
24,14	29,02	12,97	27,05	42,35	1,09
24,29	29,14	13,68	26,52	42,71	1,07
24,45	29,33	14,30	26,17	41,72	1,04
24,71	29,67	14,08	26,21	42,40	1,02
24,91	30,00	14,35	27,05	42,91	0,99
25,18	30,20	14,53	27,55	42,79	0,97
25,47	30,49	14,56	26,84	42,73	0,94
25,81	30,71	14,88	27,50	43,01	0,92
26,20	31,03	15,70	27,40	43,60	0,89
26,55	31,43	16,18	27,22	41,74	0,86
26,98	31,92	16,10	26,54	42,52	0,82
27,47	32,19	15,75	26,95	42,13	0,80
28,01	32,59	16,11	28,35	43,32	0,77
28,54	32,95	16,40	29,22	43,98	0,74
29,24	33,24	16,78	28,16	43,90	0,71
30,00	33,62	17,02	28,69	44,33	0,68
30,90	34,12	17,36	26,70	41,77	0,65
31,96	34,50	16,98	27,49	41,93	0,61
33,16	34,84	17,64	26,94	41,83	0,58

34,47	35,14	17,41	27,62	43,20	0,55
35,98	35,43	16,88	26,25	41,84	0,53
37,58	35,74	16,95	26,65	41,64	0,50
39,39	35,96	17,27	27,19	41,59	0,47
41,30	36,09	16,98	26,33	41,45	0,44
43,30	36,20	16,82	27,22	42,46	0,42
45,47	36,26	16,43	26,37	41,53	0,40
47,80	36,22	16,79	26,25	41,70	0,38
50,18	36,23	16,38	27,86	42,89	0,36
52,65	36,66	20,59	26,72	42,14	0,59
55,16	43,35	19,40	25,27	43,22	3,60
57,95	45,29	15,88	26,49	41,13	3,42
60,75	42,62	15,67	26,58	42,06	3,40
63,62	40,50	15,51	26,07	41,80	3,39
66,40	39,05	15,42	26,74	42,00	3,37
69,10	38,18	15,84	26,60	41,25	3,35
71,76	37,61	16,38	26,38	41,81	3,34
74,28	37,19	16,22	27,07	41,58	3,31
76,64	36,88	16,20	25,52	41,68	3,29
78,86	36,66	15,93	26,36	41,70	3,27
81,03	36,49	15,87	27,18	41,15	3,26
82,96	36,36	15,85	27,56	41,10	3,24
84,86	36,29	16,02	27,18	41,65	3,22
86,71	36,32	16,57	27,68	41,95	3,20
88,36	36,41	16,53	27,42	41,07	3,18
89,92	36,43	16,98	26,94	41,71	3,15
91,49	36,49	16,66	26,23	41,85	3,13
92,99	36,54	16,79	27,09	41,80	3,11
94,35	36,67	16,47	25,91	41,96	3,08
95,66	36,69	16,67	26,62	41,83	3,06
96,95	36,74	16,09	28,10	42,51	3,04
98,25	36,71	16,42	27,78	42,22	3,02
99,39	36,72	16,28	26,80	41,12	3,00
100,58	36,61	16,10	27,09	42,41	2,98
101,69	36,68	16,13	27,03	41,38	2,96
102,81	36,62	16,40	27,46	41,09	2,94
103,88	36,53	16,01	25,86	41,17	2,92
104,89	36,55	16,34	27,69	43,42	2,90
105,90	36,57	16,30	28,95	43,28	2,88
106,90	36,69	16,27	29,07	44,31	2,86
107,88	36,81	16,24	26,71	43,68	2,84
108,79	36,81	16,46	27,47	42,90	2,82
109,79	36,87	16,59	28,12	42,78	2,79
110,73	36,95	17,10	28,40	42,99	2,77
111,67	37,01	16,67	26,95	43,15	2,75
112,59	37,14	16,48	27,81	42,78	2,73
113,53	37,18	16,02	27,29	42,85	2,69
114,37	37,21	16,71	27,70	43,25	2,67

115,23	37,34	16,33	27,40	42,85	2,65
116,12	37,41	16,47	27,28	42,67	2,63
116,98	37,55	17,09	26,64	43,76	2,61
117,87	37,52	16,47	27,46	43,60	2,59
118,84	37,64	16,52	28,40	43,83	2,58
119,75	37,77	16,57	28,07	42,82	2,56
120,60	37,77	16,56	26,58	42,93	2,53
121,52	37,83	16,59	27,54	42,89	2,52
122,34	37,82	17,13	26,18	43,05	2,50
123,19	37,84	16,72	27,90	43,41	2,47
124,04	37,89	16,95	27,15	43,00	2,45
124,93	37,92	16,70	27,56	42,75	2,43
125,79	37,96	16,52	27,90	42,45	2,41
126,61	38,01	16,75	28,72	43,45	2,38
127,49	38,03	16,82	27,63	43,52	2,36
128,29	38,01	16,73	27,59	44,16	2,34
129,14	37,98	16,77	27,37	43,11	2,32
129,96	38,02	16,57	27,83	43,08	2,29
130,77	38,12	16,93	28,01	44,16	2,27
131,63	38,20	16,88	26,97	42,57	2,25
132,49	38,24	16,68	27,83	42,48	2,23
133,36	38,31	17,11	28,30	43,07	2,21
134,16	38,41	16,98	27,43	43,35	2,18
134,99	38,44	16,76	28,48	42,87	2,16
135,84	38,46	16,98	28,25	42,92	2,14
136,75	38,54	17,17	27,89	43,70	2,12
137,55	38,63	17,26	27,18	42,97	2,09
138,47	38,66	17,27	28,55	43,19	2,07
139,27	38,66	16,92	28,09	43,51	2,05
140,15	38,63	17,36	28,73	43,51	2,02
140,98	38,62	17,02	28,17	43,25	2,00
141,89	38,67	17,02	27,66	43,35	1,98
142,83	38,65	17,00	27,81	42,75	1,96
143,67	38,68	16,86	28,10	42,98	1,93
144,49	38,74	17,08	26,40	41,83	1,91
145,46	38,81	17,29	26,87	41,30	1,89
146,41	38,90	17,36	26,87	41,47	1,87
147,27	39,03	17,08	25,72	41,10	1,84
148,21	39,18	17,40	26,82	41,99	1,82
149,16	39,22	17,25	26,32	41,25	1,79
150,10	39,20	17,93	25,54	41,01	1,77
151,10	39,23	18,08	26,71	41,58	1,74
152,11	39,25	18,10	26,25	41,89	1,72
153,13	39,22	17,54	26,03	41,06	1,70
154,27	39,20	17,86	27,94	42,18	1,67
155,27	39,19	17,71	26,59	41,38	1,65
156,43	39,19	17,61	27,95	41,85	1,63
157,63	39,23	17,55	26,53	41,54	1,61

158,70	39,24	17,85	27,09	41,68	1,58
159,92	39,21	17,55	26,78	41,55	1,56
161,00	39,20	17,75	26,80	41,76	1,54
162,23	39,10	17,83	26,93	41,78	1,52
163,43	39,11	17,83	26,80	41,60	1,50
164,54	39,06	17,44	26,63	41,52	1,48
165,75	39,04	17,52	26,72	42,00	1,46
166,85	39,01	17,14	27,24	42,23	1,44
168,05	38,94	17,33	27,83	41,87	1,42
169,21	38,84	17,41	26,36	41,89	1,40
170,33	38,84	17,60	27,04	42,22	1,38
171,42	38,74	17,20	27,62	42,85	1,36
172,49	38,71	17,52	27,46	41,66	1,34
173,51	38,58	17,74	26,45	41,07	1,32
174,57	38,48	17,00	26,64	42,16	1,31
175,56	38,40	17,17	27,07	42,28	1,29
176,52	38,32	17,22	27,80	43,44	1,27
177,51	38,23	17,15	27,36	42,77	1,26
178,32	38,18	16,93	26,78	41,23	1,24
179,31	38,10	16,82	26,29	41,92	1,22
180,21	38,06	17,03	27,59	42,09	1,20
181,05	37,89	16,85	27,23	42,04	1,19
181,88	37,80	17,21	27,03	41,56	1,17
182,79	37,74	17,25	26,54	41,94	1,15
183,69	37,70	16,75	26,59	40,99	1,14
184,47	37,51	16,85	26,96	41,83	1,12
185,42	37,38	16,67	27,98	42,92	1,11
186,18	37,24	16,75	27,58	43,67	1,09
187,01	37,23	16,34	27,96	43,64	1,08
187,91	37,14	16,55	25,10	39,01	1,06
188,75	37,20	16,39	25,03	39,07	1,06
189,58	37,38	16,41	25,34	38,63	1,04
190,38	37,47	16,50	24,65	39,77	1,03
191,19	37,49	16,26	24,52	38,85	1,01
192,03	37,46	16,22	24,98	39,24	1,00
192,87	37,52	16,25	24,41	37,96	0,98
193,68	37,55	16,44	25,40	39,50	0,96
194,44	37,50	16,14	25,27	38,68	0,95
195,25	37,53	16,94	25,44	38,82	0,93
196,00	37,57	16,39	25,09	38,39	0,92
196,83	37,57	16,61	24,92	38,96	0,90
197,57	37,51	16,49	24,98	38,74	0,89
198,43	37,51	16,55	25,61	39,20	0,87
199,23	37,57	16,14	25,46	38,70	0,86
199,88	37,63	16,40	24,75	39,76	0,84
200,70	37,44	16,22	24,62	39,48	0,83
201,48	37,26	16,43	24,33	39,23	0,82
202,23	37,21	16,27	24,75	39,01	0,80

203,05	37,18	16,44	25,18	39,10	0,79
203,82	37,17	16,00	25,19	39,18	0,78
204,56	37,16	16,18	24,61	38,29	0,76
205,45	37,19	15,68	25,71	39,26	0,75
206,19	37,22	16,25	25,14	38,65	0,74
207,11	37,15	15,91	25,93	39,71	0,73
208,00	37,06	15,86	25,21	39,02	0,72
208,78	37,04	15,52	24,33	38,90	0,71
209,68	37,05	15,80	24,62	37,57	0,70
210,46	36,98	15,88	23,32	37,65	0,69
211,16	36,95	15,90	23,93	38,06	0,68
211,98	36,85	15,88	23,17	38,27	0,67
212,77	36,70	15,94	24,56	37,74	0,66
213,63	36,58	15,70	24,15	37,24	0,65

CO-Lav - [100ppm]	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
-0,01	0,00	0,05
0,29	0,00	0,22
0,45	0,01	0,23
5,55	0,05	1,58
6,70	0,07	2,29
7,14	0,08	2,47
6,55	0,07	2,61
5,71	0,06	2,33
5,67	0,06	2,44
5,94	0,05	3,28
4,33	0,04	3,31
4,05	0,05	3,45
4,24	0,04	3,77
3,90	0,04	3,63
7,80	0,06	4,44
2,67	0,03	3,57
4,84	0,05	3,20
6,09	0,06	3,73
8,24	0,07	4,42
7,71	0,08	4,61
7,76	0,08	4,52
6,60	0,06	4,80
6,68	0,07	4,52
6,25	0,06	4,27
4,68	0,04	4,15
4,92	0,05	3,82
3,97	0,04	4,04
3,98	0,05	4,60
3,40	0,04	4,43
2,85	0,03	4,21
2,24	0,03	4,14
2,27	0,03	4,15
1,98	0,02	4,36
4,48	0,05	5,19
6,22	0,06	5,69
4,98	0,05	5,26
4,66	0,05	5,21
4,70	0,06	5,26
4,63	0,05	5,37
5,17	0,05	5,63
7,50	0,08	5,85
6,29	0,06	5,90
7,09	0,07	6,06

6,63	0,07	5,92
5,59	0,05	5,71
5,89	0,06	5,71
7,19	0,07	5,73
8,14	0,07	5,76
8,52	0,09	5,44
5,41	0,06	5,20
8,15	0,08	4,85
6,69	0,07	4,56
5,22	0,05	4,34
12,45	0,06	4,82
14,39	0,07	5,02
24,36	0,12	9,16
27,94	0,14	8,75
28,20	0,15	7,75
23,91	0,13	7,43
21,38	0,11	7,83
14,94	0,07	8,06
14,74	0,08	7,81
18,04	0,09	6,59
23,81	0,12	6,05
25,33	0,13	4,36
22,40	0,12	6,33
18,15	0,09	8,83
11,80	0,06	10,59
12,09	0,07	10,31
8,72	0,04	10,23
7,71	0,04	10,02
8,87	0,04	10,02
13,44	0,06	9,86
17,06	0,07	9,90
18,91	0,08	9,66
21,22	0,10	9,57
19,75	0,09	9,58
20,21	0,09	9,69
19,32	0,10	9,90
17,25	0,08	9,89
17,24	0,08	9,83
13,66	0,07	9,73
10,79	0,05	9,65
10,29	0,05	9,63
9,85	0,04	9,58
8,57	0,03	9,60
9,07	0,05	9,51
10,42	0,04	9,51
9,59	0,04	9,45
9,65	0,04	9,43
17,80	0,07	9,38

17,44	0,07	9,31
14,89	0,06	9,20
13,72	0,05	9,06
13,74	0,06	8,82
13,02	0,05	8,91
13,84	0,06	8,99
14,13	0,05	8,97
17,08	0,06	8,96
16,71	0,07	9,04
15,33	0,06	9,17
15,19	0,06	9,23
14,88	0,06	9,35
14,61	0,06	9,57
14,86	0,06	9,53
14,45	0,06	9,58
14,78	0,06	9,51
14,12	0,06	9,53
14,37	0,06	9,54
14,46	0,06	9,60
14,79	0,07	9,67
15,21	0,06	9,78
14,63	0,07	9,97
14,21	0,06	10,04
14,42	0,06	10,04
15,11	0,07	9,99
16,75	0,08	10,06
15,70	0,07	9,99
16,30	0,07	10,05
17,14	0,08	10,07
16,57	0,07	10,20
17,55	0,08	10,19
17,01	0,07	10,17
18,15	0,08	10,21
19,47	0,08	10,16
19,12	0,09	10,39
17,38	0,07	10,46
17,48	0,07	10,58
17,94	0,08	10,65
18,38	0,10	10,78
18,09	0,08	10,75
19,55	0,08	10,91
21,39	0,10	11,09
21,00	0,09	10,97
21,46	0,10	10,88
20,73	0,09	10,81
20,17	0,09	10,75
18,29	0,08	10,70
18,56	0,08	10,79

19,33	0,09	10,84
19,03	0,08	10,87
16,31	0,08	10,94
15,28	0,07	10,77
16,47	0,08	10,43
19,45	0,08	9,98
19,87	0,10	9,88
17,85	0,08	9,68
17,66	0,08	9,59
18,23	0,08	9,47
18,45	0,09	9,42
14,76	0,07	9,36
16,56	0,08	9,30
16,27	0,08	9,36
17,64	0,08	9,31
19,27	0,09	9,32
18,40	0,09	9,33
27,18	0,13	9,25
31,56	0,15	9,26
32,68	0,17	9,04
30,95	0,16	9,01
29,40	0,15	9,05
28,31	0,14	9,07
30,96	0,15	9,01
26,95	0,14	8,86
25,73	0,13	8,49
21,72	0,11	8,28
20,85	0,10	8,27
20,65	0,10	8,34
19,91	0,11	8,31
20,36	0,10	8,37
18,98	0,10	8,45
18,36	0,10	8,45
10,51	0,08	8,59
11,13	0,08	8,74
11,64	0,08	8,89
11,74	0,08	8,95
12,07	0,09	8,97
12,59	0,08	8,99
13,38	0,09	9,05
12,88	0,08	9,03
12,91	0,09	8,94
12,05	0,08	8,84
11,29	0,07	8,81
10,68	0,07	8,77
11,42	0,08	8,72
12,29	0,09	8,74
12,15	0,09	8,71

11,62	0,09	8,63
10,92	0,08	8,24
7,51	0,06	7,89
7,05	0,06	7,76
6,89	0,06	7,66
6,81	0,05	7,57
6,49	0,06	7,56
7,75	0,06	7,52
8,21	0,07	7,54
7,79	0,07	7,58
7,66	0,06	7,60
8,44	0,08	7,46
8,99	0,08	7,41
7,15	0,07	7,39

Annex 19

Title: LF logger data 050220

Pages total: 68, excl this cover page

Datotid	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C]	Filter-4-R - [°C]	
		1	2	3	4	5
Datotid	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train remain. filter temp	Room blank filter temp	
14:54:12	22,04	28,75	28,58	29,41	24,29	
14:54:42	22,34	29,10	28,52	29,86	24,33	
14:55:12	21,93	28,96	28,56	29,72	24,26	
14:55:42	21,83	28,84	28,77	29,60	24,29	
14:56:12	22,11	28,68	28,75	29,46	24,32	
14:56:42	22,15	28,62	28,67	29,38	24,27	
14:57:12	22,25	28,48	28,67	29,23	24,15	
14:57:43	22,33	28,54	28,58	29,22	24,29	
14:58:12	22,13	28,50	5,84	29,16	24,26	
14:58:43	22,47	28,37	28,77	29,18	24,18	
14:59:13	22,19	28,26	28,75	29,18	24,16	
14:59:43	22,30	28,19	28,67	29,19	24,25	
15:00:13	22,21	28,11	28,67	28,97	24,28	
15:00:43	22,08	28,06	28,58	28,88	24,23	
15:01:13	22,31	28,06	28,88	28,88	24,22	
15:01:43	22,11	28,07	28,85	28,85	24,14	
15:02:13	21,90	28,15	28,77	28,77	24,15	
15:02:43	22,23	28,20	28,75	28,75	24,08	
15:03:13	22,13	28,35	28,67	28,67	24,11	
15:03:43	22,31	28,55	28,67	28,67	24,08	
15:04:13	22,39	28,60	28,58	28,58	24,08	
15:04:43	21,92	28,39	28,67	28,67	24,08	
15:05:13	21,92	28,33	28,64	28,64	24,16	
15:05:43	21,84	28,39	28,57	28,57	24,18	
15:06:13	22,01	28,62	28,46	28,46	24,13	
15:06:43	21,76	28,62	28,54	28,54	23,99	
15:07:13	21,72	28,55	28,54	28,54	24,01	
15:07:43	21,99	28,23	28,73	28,73	24,01	
15:08:13	21,87	28,16	28,71	28,71	24,10	
15:08:43	22,24	28,30	28,52	28,52	23,60	
15:09:13	21,88	28,31	28,46	28,46	23,24	
15:09:43	21,88	28,31	28,44	28,44	23,31	
15:10:13	21,66	28,01	28,52	28,52	23,33	
15:10:43	22,06	28,21	28,41	28,41	23,45	
15:11:13	21,40	27,97	28,58	28,58	23,36	
15:11:43	21,64	28,04	28,41	28,41	23,54	
15:12:13	21,97	28,19	28,35	28,35	23,47	
15:12:43	21,34	27,91	28,44	28,44	23,41	
15:13:13	22,05	27,81	28,50	28,50	23,57	
15:13:43	21,87	27,81	28,52	28,52	23,58	
15:14:13	22,34	27,77	28,57	28,57	23,56	
15:14:43	22,07	27,72	28,57	28,57	23,55	
15:15:13	22,23	27,74	28,57	28,57	23,60	

15:15:43	22,21	27,76	28,42	28,42	23,58
15:16:13	22,15	27,85	28,30	28,30	23,51
15:16:43	21,93	27,54	28,46	28,46	23,49
15:17:13	21,92	27,70	28,25	28,25	23,58
15:17:43	21,83	27,48	28,37	28,37	23,50
15:18:13	21,73	27,62	28,18	28,18	23,55
15:18:43	22,12	27,58	28,11	28,11	23,52
15:19:13	21,88	27,53	28,13	28,13	23,51
15:19:43	21,66	27,77	28,06	28,06	23,56
15:20:13	21,98	27,77	28,17	28,17	23,52
15:20:43	21,61	27,73	28,37	28,37	23,54
15:21:13	21,78	28,01	28,20	28,20	23,61
15:21:43	21,96	28,00	28,21	28,21	23,52
15:22:13	21,77	27,86	28,41	28,41	23,54
15:22:43	22,35	27,83	28,41	28,41	23,63
15:23:13	22,08	27,87	28,37	28,37	23,68
15:23:43	22,04	28,09	28,12	28,12	23,65
15:24:13	21,64	28,04	28,19	28,19	23,58
15:24:43	21,70	27,97	28,12	28,12	23,60
15:25:13	21,91	28,03	28,10	28,10	23,63
15:25:43	22,14	27,82	28,21	28,21	23,63
15:26:13	22,07	27,84	28,12	28,12	23,73
15:26:43	22,01	27,99	27,97	27,97	23,72
15:27:13	22,03	28,04	27,98	27,18	23,66
15:27:43	22,17	27,95	28,06	27,20	23,62
15:28:13	22,15	27,70	28,33	27,15	23,63
15:28:43	22,10	27,87	28,21	27,39	23,73
15:29:13	22,19	27,79	28,30	27,44	23,68
15:29:43	22,08	27,95	28,09	27,62	23,73
15:30:13	21,94	27,71	28,35	27,66	23,66
15:30:43	22,10	27,88	28,07	27,78	23,79
15:31:13	21,92	27,92	28,02	27,86	23,68
15:31:43	22,10	27,55	28,29	27,70	23,64
15:32:13	22,31	27,47	28,25	27,70	23,81
15:32:43	21,87	27,43	28,23	27,71	23,84
15:33:13	21,85	27,68	27,94	27,97	23,86
15:33:43	21,93	27,66	27,94	28,06	23,72
15:34:13	21,70	27,62	28,01	28,10	23,71
15:34:43	21,61	27,39	28,33	28,01	23,69
15:35:13	22,15	27,50	28,31	28,08	23,80
15:35:43	22,21	27,77	28,14	28,17	23,78
15:36:13	22,25	27,81	28,22	28,10	23,70
15:36:43	22,37	27,73	28,38	28,04	23,73
15:37:13	22,39	28,00	28,16	28,17	23,79
15:37:43	22,29	28,09	28,09	28,21	23,70
15:38:13	22,18	27,95	28,24	28,17	23,70
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20:38:47	21,29	27,78	21,34	28,15	23,07
20:39:17	21,09	27,77	21,56	28,16	23,07
20:39:47	21,06	27,68	21,37	28,17	23,05
20:40:17	21,39	27,63	21,57	28,16	23,10
20:40:47	21,29	27,76	21,47	28,24	23,11
20:41:17	21,22	27,88	21,43	28,30	23,09
20:41:47	21,06	28,04	21,18	28,37	23,09
20:42:17	21,12	28,07	21,23	28,39	23,04
20:42:47	21,16	28,11	21,36	28,34	23,05
20:43:17	21,14	28,23	21,22	28,33	23,09
20:43:47	21,01	28,18	21,24	28,34	23,03
20:44:17	20,95	28,17	21,38	28,24	23,04
20:44:47	21,02	28,30	21,18	28,29	23,11
20:45:17	20,87	28,13	21,35	28,17	23,01
20:45:47	20,98	28,26	21,16	28,22	23,11
20:46:17	20,94	28,08	21,40	28,19	23,03
20:46:47	21,09	28,13	21,39	28,29	23,12
20:47:17	21,03	28,21	21,05	28,42	23,10
20:47:47	20,83	28,06	21,22	28,35	23,02
20:48:17	20,79	27,95	21,37	28,34	23,15
20:48:47	21,16	28,08	21,20	28,46	23,18
20:49:17	21,04	28,07	21,09	28,42	23,04
20:49:47	21,04	27,89	21,47	28,35	23,04
20:50:18	21,37	27,90	21,38	28,35	23,15
20:50:48	21,45	27,84	21,51	28,25	23,09
20:51:18	21,23	27,78	21,42	28,23	23,15

20:51:48	21,29	27,86	21,27	28,25	23,16
20:52:18	21,02	27,80	21,43	28,29	23,07
20:52:48	21,12	27,80	21,42	28,34	23,09
20:53:18	21,08	27,89	21,38	28,39	23,12
20:53:48	21,14	27,98	21,53	28,42	23,13
20:54:18	21,32	28,14	21,42	28,44	23,17
20:54:48	21,04	28,17	21,46	28,44	23,18
20:55:18	21,08	28,24	21,41	28,42	23,17
20:55:48	21,02	28,26	21,40	28,40	23,19
20:56:18	20,94	28,36	21,28	28,42	23,19
20:56:48	20,92	28,33	21,30	28,37	23,10
20:57:18	20,95	28,21	21,47	28,25	23,11
20:57:48	21,01	28,36	21,34	28,34	23,23
20:58:18	21,14	28,20	21,39	28,27	23,09
20:58:48	21,81	28,17	21,41	28,24	23,21
20:59:18	21,15	28,18	21,37	28,37	23,18
20:59:48	21,20	28,14	21,31	28,34	23,10
21:00:18	21,20	28,00	21,30	28,28	23,13
21:00:48	21,03	28,08	21,31	28,36	23,14
21:01:18	21,25	28,00	21,25	28,28	23,09
21:01:48	20,98	27,97	21,29	28,28	23,08
21:02:18	21,10	27,95	21,34	28,25	23,12
21:02:48	21,37	27,86	21,32	28,19	23,10
21:03:18	21,00	27,84	21,40	28,20	23,11
21:03:48	20,95	27,81	21,30	28,25	23,11
21:04:18	20,96	27,72	21,36	28,27	23,09
21:04:48	21,27	27,65	21,37	28,28	23,15
21:05:18	20,95	27,73	21,19	28,36	23,11
21:05:48	21,07	27,95	21,26	28,47	23,10
21:06:18	21,11	28,08	21,19	28,48	23,11
21:06:48	21,13	28,16	21,12	28,45	23,09
21:07:18	21,01	28,15	21,29	28,35	23,08
21:07:48	20,88	28,16	21,38	28,30	23,11
21:08:18	21,16	28,13	21,44	28,25	23,12
21:08:48	21,15	28,19	21,28	28,22	23,19
21:09:18	20,88	28,35	21,21	28,34	23,14
21:09:48	21,24	28,16	21,42	28,31	23,10
21:10:18	21,27	28,10	21,52	28,34	23,21
21:10:48	21,29	28,13	21,46	28,41	23,19
21:11:18	21,26	28,27	21,20	28,52	23,17
21:11:48	21,11	28,12	21,41	28,45	23,09
21:12:18	21,23	28,08	21,28	28,39	23,19
21:12:48	21,22	28,20	21,24	28,46	23,18
21:13:18	21,35	28,15	21,28	28,41	23,11
21:13:48	20,98	28,01	21,41	28,31	23,10
21:14:18	21,04	27,95	21,37	28,31	23,19
21:14:48	21,09	27,94	21,37	28,31	23,21
21:15:18	21,22	27,85	21,42	28,24	23,21

21:15:48	21,08	27,84	21,40	28,24	23,24
21:16:18	20,97	27,83	21,21	28,21	23,19
21:16:48	21,05	27,81	21,43	28,18	23,21
21:17:18	21,09	27,72	21,30	28,08	23,19
21:17:48	20,99	27,72	21,30	28,08	23,23

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
15,83	17,46	26,49	26,18	22,80	6,93
15,78	17,53	26,46	26,21	22,67	6,67
15,78	17,49	26,48	26,23	22,67	6,65
15,75	17,50	26,44	26,23	22,64	6,69
15,69	17,55	26,42	26,21	22,60	6,66
15,67	17,54	26,42	26,21	22,60	6,66
15,77	17,40	26,43	26,18	22,65	6,79
15,66	17,51	26,43	26,21	22,54	6,77
15,73	17,47	26,43	26,17	22,64	6,77
15,82	17,38	26,46	26,17	22,68	6,75
15,82	17,37	26,46	26,15	22,68	6,75
15,70	17,47	26,41	26,15	22,54	6,76
15,67	17,46	26,40	26,17	22,52	6,74
15,70	17,43	26,40	26,18	22,50	6,73
15,65	17,41	26,38	26,15	22,46	6,75
15,71	17,37	26,36	26,15	22,47	6,74
15,73	17,36	26,36	26,13	22,46	6,74
15,75	17,34	26,37	26,10	22,47	6,72
15,71	17,34	26,35	26,11	22,45	6,74
15,80	17,31	26,38	26,08	22,55	6,76
15,82	17,30	26,38	26,11	22,52	6,74
15,83	17,26	26,37	26,08	22,54	6,74
15,72	17,31	26,33	26,09	22,45	6,72
15,67	17,33	26,33	26,10	22,41	6,70
15,66	17,33	26,33	26,08	22,39	6,74
15,77	17,22	26,35	26,04	22,47	6,71
15,73	17,22	26,32	26,03	22,43	6,74
15,72	17,20	26,27	26,01	22,45	6,75
15,59	17,30	26,26	26,03	22,33	6,72
15,55	17,34	26,27	26,03	22,33	6,73
15,64	17,26	26,29	25,99	22,45	6,76
15,65	17,23	26,25	25,97	22,43	6,74
15,65	17,26	26,26	26,00	22,37	6,73
15,54	17,32	26,21	25,98	22,30	6,75
15,62	17,27	26,24	25,99	22,31	6,74
15,57	17,39	26,22	26,01	22,24	6,75
15,65	17,36	26,26	25,96	22,34	6,71
15,70	17,32	26,24	25,99	22,34	6,73
15,59	17,43	26,19	25,99	22,26	6,71
15,59	17,45	26,19	26,02	22,23	6,75
15,62	17,42	26,19	25,97	22,27	6,75
15,60	17,41	26,18	25,98	22,29	6,74
15,58	17,46	26,21	25,99	22,25	6,72

15,59	17,45	26,17	25,98	22,29	6,74
15,64	17,41	26,19	25,95	22,36	6,74
15,72	17,39	26,22	25,94	22,41	6,74
15,61	17,46	26,18	25,97	22,31	6,72
15,68	17,41	26,20	25,93	22,37	6,73
15,61	17,45	26,16	25,92	22,33	6,72
15,70	17,41	26,19	25,95	22,35	6,72
15,73	17,38	26,17	25,91	22,39	6,72
15,68	17,42	26,18	25,92	22,32	6,74
15,76	17,34	26,13	25,87	22,42	6,73
15,70	17,42	26,20	25,90	22,33	6,75
15,66	17,44	26,16	25,94	22,29	6,73
15,77	17,36	26,14	25,88	22,38	6,75
15,76	17,39	26,17	25,89	22,37	6,75
15,73	17,46	26,13	25,91	22,32	6,75
15,70	17,47	26,14	25,91	22,31	6,72
15,74	17,48	26,15	25,91	22,32	6,74
15,82	17,40	26,16	25,89	22,34	6,74
15,85	17,42	26,12	25,87	22,39	6,74
15,80	17,47	26,16	25,89	22,30	6,72
15,88	17,42	26,13	25,88	22,39	6,73
15,75	17,54	26,17	25,93	22,26	6,74
15,77	17,55	26,15	25,93	22,26	6,72
15,86	17,48	26,15	25,90	22,31	6,71
15,95	17,45	26,15	25,87	22,43	6,73
15,95	17,48	26,17	25,86	22,42	6,73
15,83	17,60	26,17	25,93	22,29	6,71
15,95	17,51	26,16	25,91	22,40	6,70
15,88	17,60	26,19	25,93	22,33	6,72
16,00	17,52	26,19	25,91	22,39	6,69
15,94	17,61	26,17	25,95	22,36	6,68
16,01	17,54	26,20	25,92	22,40	6,69
16,05	17,48	26,20	25,89	22,44	6,67
15,91	17,64	26,18	25,96	22,31	6,67
15,90	17,65	26,19	25,94	22,30	6,71
15,89	17,66	26,19	25,98	22,29	6,70
16,02	17,51	26,17	25,87	22,39	6,67
16,03	17,52	26,18	25,90	22,41	6,70
15,99	17,53	26,19	25,89	22,38	6,68
15,87	17,59	26,18	25,95	22,28	6,69
15,90	17,54	26,16	25,92	22,31	6,69
15,96	17,43	26,17	25,87	22,37	6,66
15,91	17,46	26,16	25,90	22,31	6,68
15,86	17,52	26,16	25,92	22,28	6,66
15,95	17,41	26,14	25,88	22,34	6,67
15,93	17,40	26,15	25,87	22,32	6,64
15,85	17,48	26,16	25,89	22,24	6,68
15,88	17,47	26,11	25,89	22,26	6,65

15,92	17,41	26,15	25,85	22,29	6,55
15,91	17,43	26,12	25,84	22,29	6,63
15,89	17,42	26,13	25,87	22,23	6,77
15,97	17,35	26,13	25,83	22,30	6,76
15,90	17,41	26,11	25,88	22,18	6,75
15,80	17,45	26,08	25,86	22,16	6,75
15,78	17,46	26,11	25,90	22,12	6,75
15,78	17,44	26,07	25,89	22,12	6,73
15,86	17,34	26,07	25,86	22,21	6,74
15,91	17,32	26,09	25,84	22,21	6,73
15,94	17,29	26,08	25,81	22,25	6,73
15,82	17,39	26,07	25,86	22,11	6,73
15,92	17,31	26,05	25,82	22,20	6,73
15,87	17,41	26,12	25,86	22,15	6,71
16,00	17,29	26,08	25,81	22,27	6,74
15,83	17,42	26,08	25,86	22,12	6,72
15,84	17,43	26,08	25,86	22,09	6,69
15,96	17,29	26,07	25,81	22,22	6,71
15,89	17,37	26,05	25,83	22,09	6,70
15,78	17,43	26,03	25,84	22,06	6,73
15,81	17,38	26,03	25,81	22,08	6,69
15,80	17,37	26,01	25,80	22,08	6,69
15,71	17,43	26,02	25,83	22,02	6,71
15,79	17,34	26,03	25,79	22,11	6,71
15,79	17,34	26,03	25,80	22,13	6,69
15,79	17,34	25,99	25,76	22,11	6,69
15,78	17,34	26,00	25,74	22,13	6,69
15,65	17,42	26,01	25,80	21,99	6,69
15,73	17,36	25,97	25,76	22,08	6,70
15,81	17,32	26,02	25,73	22,15	6,70
15,69	17,33	26,01	25,78	22,04	6,69
15,80	17,23	25,98	25,73	22,12	6,68
15,71	17,28	25,99	25,70	22,10	6,68
15,65	17,33	25,99	25,74	21,99	6,68
15,71	17,21	25,96	25,69	22,04	6,69
15,67	17,29	25,95	25,71	22,01	6,67
15,62	17,32	25,95	25,73	21,96	6,69
15,60	17,26	25,91	25,73	21,95	6,69
15,61	17,30	25,89	25,72	21,93	6,67
15,60	17,29	25,90	25,72	21,91	6,68
15,60	17,33	25,86	25,68	21,93	6,66
15,70	17,22	25,90	25,63	22,05	6,67
15,69	17,24	25,92	25,66	22,05	6,68
15,68	17,22	25,92	25,64	22,02	6,71
15,60	17,29	25,91	25,64	21,97	6,71
15,57	17,31	25,87	25,65	21,92	6,69
15,58	17,28	25,88	25,64	21,90	6,70
15,56	17,27	25,85	25,62	21,91	6,68

15,56	17,24	25,85	25,63	21,88	6,70
15,64	17,16	25,89	25,64	21,98	6,68
15,55	17,25	25,84	25,62	21,91	6,69
15,54	17,24	25,83	25,62	21,87	6,69
15,56	17,22	25,82	25,61	21,88	6,71
15,60	17,21	25,85	25,60	21,91	6,68
15,56	17,21	25,81	25,59	21,86	6,70
15,52	17,25	25,78	25,57	21,85	6,68
15,63	17,14	25,82	25,54	21,94	6,70
15,54	17,26	25,81	25,56	21,88	6,70
15,69	17,19	25,84	25,55	21,95	6,68
15,68	17,17	25,80	25,52	21,95	6,68
15,67	17,21	25,80	25,51	21,95	6,69
15,59	17,27	25,80	25,53	21,88	6,66
15,54	17,29	25,80	25,55	21,80	6,69
15,63	17,18	25,78	25,50	21,89	6,68
15,67	17,16	25,75	25,48	21,91	6,69
15,52	17,30	25,78	25,55	21,83	6,68
15,64	17,18	25,74	25,50	21,94	6,67
15,59	17,24	25,78	25,50	21,86	6,68
15,56	17,30	25,77	25,53	21,85	6,68
15,67	17,21	25,75	25,47	21,94	6,68
15,61	17,31	25,73	25,49	21,87	6,67
15,63	17,28	25,75	25,49	21,89	6,71
15,68	17,29	25,72	25,49	21,94	6,74
15,75	17,24	25,78	25,44	22,01	6,73
15,77	17,26	25,77	25,47	22,03	6,73
15,67	17,38	25,74	25,52	21,90	6,72
15,70	17,35	25,75	25,50	21,93	6,74
15,79	17,31	25,75	25,45	22,01	6,74
15,78	17,36	25,74	25,47	22,02	6,74
15,71	17,43	25,76	25,51	21,95	6,73
15,66	17,45	25,78	25,54	21,93	6,74
15,74	17,38	25,77	25,50	22,00	6,73
15,80	17,32	25,74	25,46	22,05	6,73
15,73	17,46	25,75	25,49	21,99	6,75
15,72	17,44	25,79	25,52	21,95	6,75
15,83	17,36	25,73	25,47	22,06	6,74
15,73	17,50	25,78	25,50	21,96	6,74
15,79	17,40	25,76	25,50	22,02	6,72
15,81	17,39	25,77	25,50	22,03	6,72
15,72	17,47	25,77	25,54	21,95	6,73
15,84	17,40	25,80	25,50	22,08	6,72
15,79	17,48	25,80	25,56	22,03	6,71
15,81	17,46	25,81	25,57	22,03	6,73
15,90	17,40	25,81	25,52	22,11	6,72
15,80	17,52	25,83	25,56	22,01	6,74
15,88	17,45	25,84	25,56	22,09	6,73

15,91	17,41	25,82	25,53	22,15	6,73
15,82	17,55	25,87	25,59	22,05	6,72
15,91	17,45	25,84	25,56	22,14	6,73
15,88	17,48	25,86	25,57	22,09	6,74
15,88	17,49	25,83	25,58	22,09	6,72
15,96	17,40	25,86	25,54	22,16	6,72
15,91	17,41	25,86	25,55	22,14	6,73
15,81	17,50	25,84	25,60	22,03	6,71
15,79	17,47	25,84	25,61	22,03	6,72
15,78	17,45	25,83	25,61	22,02	6,72
15,79	17,44	25,82	25,62	21,98	6,71
15,82	17,39	25,85	25,58	22,04	6,74
15,83	17,39	25,80	25,55	22,06	6,72
15,75	17,39	25,83	25,57	21,98	6,73
15,85	17,28	25,79	25,49	22,05	6,70
15,79	17,33	25,78	25,50	22,04	6,72
15,76	17,28	25,80	25,49	22,01	6,72
15,69	17,38	25,76	25,52	21,92	6,70
15,73	17,32	25,75	25,51	21,96	6,72
15,75	17,28	25,75	25,48	21,99	6,71
15,70	17,33	25,77	25,48	21,94	6,72
15,64	17,40	25,76	25,52	21,87	6,73
15,68	17,36	25,74	25,53	21,89	6,72
15,66	17,39	25,74	25,51	21,90	6,74
15,64	17,38	25,74	25,50	21,86	6,74
15,74	17,29	25,72	25,44	21,97	6,73
15,64	17,37	25,74	25,49	21,89	6,73
15,67	17,38	25,71	25,48	21,89	6,72
15,67	17,33	25,69	25,45	21,91	6,73
15,65	17,30	25,69	25,44	21,89	6,73
15,57	17,31	25,70	25,43	21,86	6,72
15,61	17,30	25,65	25,42	21,85	6,71
15,57	17,33	25,68	25,43	21,82	6,71
15,57	17,33	25,67	25,41	21,81	6,75
15,61	17,26	25,63	25,38	21,85	6,74
15,63	17,27	25,64	25,38	21,85	6,74
15,62	17,29	25,62	25,40	21,83	6,72
15,57	17,27	25,58	25,37	21,81	6,73
15,52	17,28	25,60	25,37	21,78	6,72
15,53	17,29	25,59	25,39	21,77	6,71
15,56	17,26	25,58	25,33	21,82	6,71
15,53	17,28	25,58	25,36	21,75	6,72
15,58	17,27	25,56	25,31	21,75	6,72
15,54	17,28	25,57	25,34	21,73	6,72
15,57	17,29	25,54	25,35	21,75	6,72
15,45	17,25	25,51	25,31	21,69	6,72
15,47	17,24	25,54	25,29	21,73	6,72
15,50	17,23	25,52	25,27	21,74	6,74

15,51	17,23	25,51	25,26	21,75	6,72
15,54	17,20	25,52	25,28	21,73	6,72
15,50	17,25	25,52	25,26	21,69	6,72
15,44	17,22	25,48	25,23	21,65	6,72
15,44	17,21	25,46	25,24	21,65	6,71
15,51	17,17	25,48	25,20	21,71	6,73
15,53	17,16	25,45	25,21	21,71	6,71
15,46	17,23	25,47	25,25	21,64	6,74
15,54	17,16	25,42	25,21	21,70	6,72
15,43	17,18	25,41	25,20	21,60	6,72
15,49	17,12	25,37	25,14	21,69	6,74
15,37	17,24	25,41	25,21	21,57	6,72
15,50	17,12	25,42	25,17	21,70	6,71
15,45	17,18	25,40	25,15	21,63	6,74
15,48	17,16	25,40	25,20	21,62	6,73
15,42	17,11	25,36	25,11	21,64	6,73
15,41	17,15	25,31	25,13	21,52	6,70
15,41	17,16	25,31	25,12	21,54	6,73
15,41	17,15	25,33	25,10	21,59	6,72
15,46	17,11	25,35	25,16	21,59	6,74
15,44	17,17	25,31	25,13	21,55	6,73
15,43	17,06	25,31	25,06	21,56	6,71
15,38	17,13	25,27	25,05	21,53	6,73
15,43	17,10	25,30	25,06	21,58	6,72
15,40	17,11	25,27	25,06	21,54	6,75
15,44	17,12	25,27	25,09	21,52	6,72
15,34	17,08	25,25	25,04	21,50	6,72
15,41	17,02	25,25	25,03	21,52	6,74
15,37	17,08	25,23	25,01	21,47	6,72
15,44	17,01	25,26	25,02	21,54	6,73
15,44	17,01	25,25	25,04	21,49	6,72
15,46	16,99	25,25	25,05	21,53	6,75
15,42	16,96	25,22	24,99	21,53	6,73
15,41	16,97	25,19	25,00	21,49	6,72
15,39	16,98	25,20	24,94	21,52	6,73
15,37	17,04	25,18	25,01	21,44	6,73
15,35	17,07	25,18	25,01	21,43	6,73
15,36	16,98	25,17	24,95	21,47	6,72
15,41	16,96	25,13	24,88	21,50	6,74
15,32	17,01	25,17	24,93	21,41	6,72
15,32	17,07	25,15	24,96	21,43	6,73
15,37	17,06	25,13	24,92	21,47	6,71
15,41	16,96	25,14	24,89	21,51	6,72
15,39	16,99	25,11	24,88	21,48	6,73
15,25	17,10	25,13	24,93	21,36	6,72
15,43	16,98	25,09	24,87	21,49	6,72
15,34	17,05	25,14	24,91	21,41	6,73
15,32	17,12	25,11	24,94	21,41	6,73

15,32	17,01	25,09	24,87	21,40	6,73
15,39	17,01	25,04	24,82	21,45	6,73
15,32	17,07	25,10	24,86	21,38	6,74
15,36	17,10	25,07	24,86	21,40	6,73
15,36	17,06	25,08	24,88	21,42	6,73
15,40	16,97	25,04	24,79	21,46	6,74
15,39	17,03	25,05	24,76	21,44	6,73
15,39	17,04	25,04	24,78	21,46	6,74
15,33	17,10	25,05	24,81	21,37	6,74
15,33	17,13	25,04	24,86	21,35	6,72
15,41	17,03	25,04	24,81	21,42	6,72
15,40	16,96	24,99	24,73	21,42	6,74
15,32	17,07	25,00	24,78	21,34	6,73
15,35	17,05	25,00	24,78	21,37	6,74
15,34	17,12	25,00	24,81	21,32	6,74
15,44	17,04	25,01	24,77	21,40	6,73
15,37	17,05	24,96	24,76	21,37	6,74
15,35	17,05	24,98	24,74	21,34	6,75
15,35	17,09	24,95	24,75	21,30	6,73
15,36	17,05	24,96	24,73	21,34	6,72
15,35	17,17	24,96	24,77	21,30	6,74
15,39	16,99	24,92	24,73	21,38	6,74
15,40	17,00	24,92	24,68	21,38	6,73
15,27	17,12	24,94	24,77	21,27	6,75
15,35	17,04	24,91	24,71	21,31	6,75
15,35	17,08	24,93	24,75	21,30	6,74
15,38	17,07	24,92	24,73	21,33	6,76
15,38	16,96	24,88	24,65	21,37	6,72
15,33	17,06	24,90	24,68	21,33	6,73
15,26	17,10	24,91	24,70	21,27	6,75
15,36	17,06	24,87	24,68	21,34	6,75
15,30	17,13	24,92	24,71	21,28	6,74
15,39	17,05	24,92	24,71	21,32	6,77
15,38	17,00	24,88	24,67	21,30	6,75
15,41	16,97	24,86	24,65	21,31	6,75
15,41	17,00	24,87	24,63	21,33	6,74
15,33	17,08	24,89	24,66	21,28	6,76
15,32	17,10	24,88	24,68	21,28	6,74
15,37	17,06	24,88	24,65	21,33	6,73
15,33	17,02	24,84	24,62	21,29	6,75
15,27	17,07	24,87	24,66	21,20	6,75
15,39	16,99	24,83	24,61	21,32	6,75
15,33	17,03	24,86	24,63	21,26	6,72
15,33	17,08	24,84	24,66	21,23	6,75
15,32	17,01	24,81	24,62	21,25	6,74
15,33	16,97	24,80	24,57	21,27	6,74
15,34	16,95	24,80	24,56	21,28	6,76
15,33	16,98	24,80	24,60	21,25	6,74

15,33	17,03	24,81	24,60	21,26	6,76
15,34	17,02	24,84	24,59	21,27	6,74
15,32	17,00	24,82	24,60	21,25	6,75
15,24	17,00	24,79	24,58	21,19	6,75
15,32	16,94	24,79	24,55	21,25	6,76
15,27	17,02	24,79	24,56	21,21	6,76
15,25	17,03	24,81	24,60	21,20	6,75
15,28	17,02	24,81	24,60	21,22	6,77
15,23	16,96	24,76	24,55	21,20	6,76
15,25	16,93	24,73	24,53	21,19	6,74
15,24	16,91	24,75	24,51	21,21	6,76
15,26	16,93	24,76	24,53	21,20	6,75
15,27	16,95	24,77	24,52	21,21	6,76
15,24	16,99	24,77	24,56	21,21	6,75
15,21	16,93	24,76	24,53	21,19	6,76
15,19	16,91	24,72	24,50	21,14	6,77
15,20	16,90	24,71	24,48	21,20	6,76
15,19	16,94	24,74	24,55	21,17	6,77
15,22	16,92	24,72	24,53	21,20	6,76
15,20	16,94	24,74	24,49	21,23	6,77
15,19	16,89	24,71	24,47	21,21	6,76
15,16	16,88	24,66	24,46	21,16	6,76
15,16	16,92	24,68	24,50	21,15	6,74
15,18	16,88	24,68	24,47	21,18	6,78
15,18	16,87	24,70	24,46	21,20	6,76
15,16	16,90	24,72	24,50	21,17	6,77
15,17	16,86	24,72	24,49	21,19	6,77
15,11	16,83	24,64	24,46	21,13	6,77
15,13	16,83	24,67	24,43	21,15	6,78
15,12	16,83	24,67	24,44	21,16	6,77
15,16	16,82	24,66	24,44	21,18	6,77
15,10	16,87	24,68	24,48	21,15	6,76
15,15	16,85	24,66	24,46	21,17	6,77
15,06	16,83	24,62	24,44	21,09	6,77
15,07	16,84	24,62	24,45	21,09	6,77
15,06	16,86	24,64	24,46	21,09	6,77
15,15	16,78	24,62	24,42	21,18	6,76
15,07	16,88	24,68	24,44	21,11	6,77
15,09	16,88	24,65	24,46	21,11	6,77
15,14	16,77	24,61	24,39	21,18	6,77
15,03	16,85	24,61	24,39	21,10	6,75
15,04	16,82	24,64	24,38	21,14	6,77
15,11	16,78	24,64	24,42	21,16	6,78
15,07	16,82	24,62	24,45	21,11	6,78
15,10	16,81	24,66	24,43	21,16	6,78
15,12	16,78	24,66	24,42	21,20	6,78
15,03	16,81	24,59	24,37	21,13	6,78
14,99	16,85	24,58	24,40	21,06	6,77

15,08	16,75	24,61	24,38	21,16	6,78
15,03	16,80	24,60	24,37	21,15	6,78
15,09	16,78	24,60	24,39	21,16	6,75
14,97	16,88	24,59	24,43	21,07	6,77
15,00	16,81	24,61	24,38	21,12	6,78
15,13	16,74	24,62	24,40	21,19	6,78
14,94	16,82	24,56	24,38	21,06	6,77
15,00	16,79	24,58	24,38	21,12	6,80
14,98	16,81	24,58	24,35	21,10	6,77
15,07	16,71	24,61	24,35	21,20	6,77
15,06	16,73	24,58	24,36	21,17	6,75
15,08	16,71	24,59	24,35	21,15	6,78
15,11	16,69	24,56	24,31	21,18	6,76
14,94	16,79	24,56	24,35	21,05	6,78
14,91	16,79	24,57	24,38	21,05	6,76
15,00	16,72	24,53	24,32	21,14	6,78
14,95	16,79	24,57	24,36	21,07	6,80
14,99	16,74	24,56	24,35	21,11	6,77
15,02	16,78	24,53	24,35	21,12	6,78
15,06	16,69	24,58	24,32	21,15	6,77
14,99	16,77	24,57	24,34	21,15	6,78
14,90	16,75	24,56	24,33	21,04	6,77
14,98	16,72	24,52	24,29	21,13	6,77
14,90	16,79	24,56	24,36	21,05	6,76
14,99	16,70	24,55	24,33	21,11	6,73
14,99	16,74	24,54	24,32	21,14	6,74
14,97	16,73	24,57	24,31	21,08	6,73
15,04	16,71	24,54	24,31	21,14	6,71
14,91	16,81	24,55	24,36	21,03	6,73
15,01	16,65	24,52	24,31	21,12	6,73
15,02	16,68	24,51	24,28	21,13	6,72
14,96	16,71	24,56	24,31	21,07	6,73
14,98	16,73	24,53	24,31	21,08	6,72
15,03	16,65	24,53	24,28	21,13	6,72
14,99	16,70	24,54	24,28	21,09	6,73
14,93	16,81	24,55	24,35	21,04	6,72
15,06	16,70	24,53	24,28	21,13	6,71
14,89	16,76	24,51	24,32	21,03	6,74
14,94	16,74	24,50	24,30	21,05	6,73
14,97	16,73	24,52	24,31	21,05	6,72
14,99	16,74	24,48	24,29	21,11	6,71
14,98	16,73	24,54	24,29	21,06	6,72
14,93	16,80	24,53	24,31	21,05	6,71
15,06	16,71	24,52	24,27	21,13	6,72
15,02	16,73	24,53	24,27	21,11	6,72
14,91	16,79	24,50	24,30	20,99	6,72
14,97	16,72	24,47	24,28	21,07	6,73
14,94	16,73	24,51	24,29	21,04	6,72

15,02	16,68	24,49	24,26	21,07	6,72
14,93	16,80	24,45	24,28	20,97	6,71
14,95	16,75	24,49	24,29	21,00	6,75
15,04	16,69	24,49	24,27	21,09	6,72
15,00	16,73	24,49	24,28	21,04	6,74
14,93	16,79	24,48	24,32	20,99	6,73
14,96	16,70	24,48	24,25	21,08	6,74
15,02	16,64	24,48	24,25	21,09	6,71
15,02	16,63	24,45	24,20	21,11	6,73
15,02	16,67	24,47	24,19	21,09	6,71
15,07	16,63	24,49	24,20	21,11	6,72
15,04	16,66	24,50	24,23	21,09	6,71
14,90	16,80	24,47	24,26	20,94	6,74
14,95	16,77	24,48	24,28	20,99	6,72
14,95	16,75	24,46	24,29	21,00	6,71
15,02	16,66	24,47	24,23	21,09	6,72
14,98	16,65	24,44	24,22	21,05	6,72
15,02	16,59	24,44	24,19	21,08	6,72
15,01	16,55	24,43	24,17	21,09	6,71
15,00	16,53	24,46	24,18	21,11	6,72
14,88	16,63	24,47	24,23	21,02	6,71
14,84	16,62	24,49	24,27	21,00	6,74
14,96	16,50	24,47	24,22	21,14	6,74
14,89	16,57	24,48	24,26	21,10	6,73
14,82	16,61	24,50	24,27	21,09	6,74
14,79	16,55	24,49	24,32	21,04	6,76
14,80	16,50	24,46	24,24	21,02	6,74
14,87	16,44	24,46	24,24	21,08	6,73
14,92	16,40	24,46	24,22	21,17	6,74
14,83	16,48	24,50	24,26	21,10	6,74
14,79	16,51	24,52	24,30	21,04	6,74
14,84	16,42	24,52	24,30	21,12	6,74
14,93	16,41	24,52	24,28	21,17	6,72
14,85	16,51	24,54	24,34	21,12	6,75
14,94	16,41	24,59	24,31	21,20	6,74
15,00	16,38	24,57	24,30	21,27	6,74
14,97	16,38	24,60	24,31	21,22	6,73
14,94	16,45	24,60	24,32	21,21	6,73
14,90	16,45	24,61	24,31	21,22	6,73
14,95	16,41	24,60	24,30	21,25	6,75
14,86	16,49	24,64	24,40	21,16	6,73
14,85	16,45	24,61	24,36	21,14	6,73
15,00	16,35	24,62	24,33	21,28	6,75
14,87	16,43	24,63	24,33	21,24	6,76
14,81	16,50	24,65	24,40	21,17	6,72
14,92	16,38	24,66	24,38	21,26	6,75
14,92	16,44	24,66	24,38	21,27	6,74
14,83	16,51	24,69	24,44	21,18	6,74

14,95	16,37	24,70	24,42	21,30	6,72
14,93	16,42	24,68	24,41	21,29	6,74
14,92	16,38	24,72	24,44	21,30	6,74
14,91	16,42	24,70	24,44	21,28	6,75
14,89	16,42	24,73	24,45	21,24	6,74
15,01	16,33	24,73	24,42	21,37	6,74
14,90	16,44	24,74	24,47	21,29	6,74
14,90	16,45	24,78	24,49	21,28	6,73
15,02	16,35	24,74	24,44	21,40	6,75
14,94	16,42	24,78	24,48	21,31	6,74
14,88	16,48	24,77	24,53	21,26	6,74
14,92	16,45	24,80	24,52	21,35	6,76
15,02	16,39	24,81	24,49	21,41	6,75
14,99	16,42	24,84	24,52	21,40	6,74
15,00	16,39	24,82	24,52	21,41	6,73
15,03	16,38	24,83	24,55	21,44	6,75
15,01	16,39	24,88	24,56	21,44	6,75
14,99	16,43	24,86	24,58	21,40	6,73
15,03	16,37	24,88	24,59	21,46	6,74
14,99	16,44	24,87	24,60	21,41	6,72
14,99	16,45	24,90	24,63	21,43	6,74
14,99	16,47	24,90	24,63	21,45	6,74
14,97	16,49	24,92	24,67	21,42	6,75
15,00	16,48	24,92	24,66	21,44	6,74
14,97	16,49	24,94	24,66	21,45	6,75
15,01	16,44	24,94	24,64	21,47	6,75
14,95	16,51	24,98	24,71	21,41	6,73
15,06	16,39	24,96	24,64	21,54	6,72
14,99	16,50	24,97	24,70	21,44	6,73
15,05	16,42	24,99	24,69	21,49	6,73
15,06	16,42	24,97	24,68	21,49	6,74
14,99	16,51	24,98	24,72	21,42	6,76
15,01	16,47	24,97	24,73	21,44	6,73
14,99	16,49	24,99	24,73	21,47	6,74
15,02	16,47	25,03	24,73	21,51	6,73
14,97	16,53	25,01	24,75	21,46	6,73
14,96	16,51	25,02	24,78	21,46	6,74
15,07	16,40	25,06	24,74	21,60	6,75
15,06	16,48	25,04	24,77	21,50	6,75
15,12	16,41	25,06	24,74	21,60	6,75
15,03	16,45	25,04	24,79	21,50	6,74
15,03	16,49	25,07	24,79	21,52	6,74
15,11	16,45	25,09	24,78	21,59	6,74
14,98	16,52	25,05	24,79	21,47	6,75
15,08	16,45	25,10	24,76	21,62	6,73
14,98	16,52	25,09	24,81	21,50	6,76
14,95	16,50	25,09	24,82	21,49	6,75
14,96	16,48	25,08	24,81	21,52	6,72

15,08	16,39	25,09	24,76	21,64	6,74
15,12	16,38	25,10	24,80	21,62	6,74
15,11	16,43	25,10	24,80	21,59	6,75
15,02	16,46	25,10	24,82	21,52	6,73
15,14	16,36	25,10	24,80	21,65	6,74
15,10	16,43	25,13	24,80	21,63	6,74
15,11	16,41	25,15	24,78	21,66	6,75
15,07	16,47	25,16	24,85	21,63	6,74
15,05	16,47	25,17	24,87	21,60	6,75
15,14	16,44	25,13	24,83	21,65	6,76
15,04	16,53	25,19	24,89	21,57	6,74
15,15	16,43	25,16	24,83	21,68	6,76
15,07	16,51	25,17	24,87	21,59	6,74
15,04	16,51	25,18	24,91	21,54	6,74
15,09	16,49	25,17	24,87	21,62	6,74
15,14	16,46	25,19	24,87	21,61	6,76
15,08	16,52	25,18	24,90	21,54	6,74
15,14	16,49	25,16	24,89	21,59	6,75
15,10	16,51	25,16	24,89	21,61	6,74
15,16	16,46	25,20	24,88	21,66	6,74
15,08	16,54	25,22	24,90	21,61	6,73
15,18	16,45	25,23	24,92	21,68	6,76
15,09	16,50	25,21	24,87	21,64	6,74
15,10	16,56	25,20	24,90	21,62	6,76
15,20	16,44	25,24	24,90	21,72	6,74
15,13	16,51	25,24	24,96	21,61	6,75
15,11	16,52	25,24	24,96	21,64	6,74
15,19	16,51	25,26	24,93	21,72	6,75
15,20	16,50	25,26	24,95	21,67	6,75
15,18	16,52	25,25	24,93	21,68	6,74
15,25	16,45	25,28	24,92	21,75	6,75
15,24	16,45	25,30	24,95	21,76	6,74
15,27	16,44	25,28	24,94	21,76	6,75
15,14	16,58	25,28	24,97	21,67	6,74
15,07	16,60	25,30	25,01	21,61	6,75
15,10	16,58	25,28	25,00	21,65	6,74
15,10	16,58	25,29	25,00	21,67	6,75
15,17	16,51	25,29	24,99	21,72	6,75
15,17	16,50	25,32	24,96	21,76	6,75
15,21	16,48	25,33	24,98	21,74	6,75
15,08	16,58	25,31	25,04	21,65	6,75
15,20	16,44	25,33	24,99	21,79	6,74
15,20	16,45	25,33	25,00	21,78	6,74
15,20	16,45	25,33	25,00	21,76	6,75
15,14	16,52	25,33	25,03	21,69	6,74
15,11	16,53	25,34	25,02	21,73	6,74
15,19	16,42	25,35	25,02	21,80	6,75
15,13	16,46	25,35	25,00	21,77	6,74

15,10	16,54	25,34	25,05	21,68	6,75
15,19	16,41	25,37	25,03	21,81	6,75
15,16	16,42	25,36	25,01	21,80	6,74
15,05	16,54	25,35	25,05	21,66	6,75
15,14	16,47	25,35	25,07	21,74	6,75
15,14	16,42	25,38	25,04	21,80	6,74
15,11	16,45	25,37	25,02	21,78	6,75
15,12	16,48	25,37	25,04	21,72	6,73
15,06	16,49	25,36	25,05	21,73	6,76
15,05	16,50	25,38	25,08	21,68	6,75
15,04	16,52	25,34	25,05	21,72	6,75
15,02	16,50	25,34	25,06	21,69	6,75
15,01	16,48	25,37	25,06	21,72	6,72
15,02	16,48	25,39	25,08	21,71	6,75
15,03	16,52	25,37	25,11	21,72	6,75
15,10	16,38	25,36	25,03	21,80	6,73
15,05	16,43	25,36	25,04	21,77	6,74
15,06	16,42	25,39	25,06	21,77	6,75
15,02	16,49	25,37	25,09	21,70	6,74
15,09	16,40	25,39	25,06	21,79	6,73
15,09	16,40	25,37	25,07	21,77	6,74
15,06	16,37	25,36	25,06	21,76	6,74
15,05	16,36	25,38	25,06	21,76	6,75
15,02	16,35	25,38	25,06	21,76	6,76
15,00	16,38	25,35	25,06	21,72	6,74
15,01	16,34	25,37	25,04	21,80	6,76
14,95	16,41	25,37	25,04	21,72	6,75
14,96	16,40	25,37	25,04	21,75	6,76
14,95	16,40	25,38	25,03	21,76	6,75
14,92	16,44	25,36	25,06	21,72	6,75
14,94	16,43	25,39	25,11	21,70	6,74
15,04	16,35	25,41	25,08	21,81	6,75
14,97	16,35	25,41	25,06	21,80	6,76
14,96	16,39	25,39	25,07	21,79	6,75
14,92	16,42	25,37	25,07	21,70	6,75
14,92	16,42	25,37	25,08	21,71	6,75
14,93	16,39	25,39	25,06	21,79	6,76
14,92	16,44	25,37	25,11	21,71	6,73
15,00	16,31	25,41	25,06	21,84	6,74
14,98	16,34	25,40	25,07	21,76	6,76
15,04	16,31	25,40	25,06	21,81	6,73
14,97	16,40	25,39	25,10	21,76	6,75
14,96	16,38	25,40	25,13	21,75	6,73
14,96	16,36	25,39	25,08	21,77	6,74
14,95	16,35	25,41	25,13	21,77	6,74
14,97	16,36	25,39	25,08	21,77	6,74
14,98	16,35	25,42	25,08	21,80	6,76
14,95	16,36	25,40	25,08	21,79	6,73

14,95	16,38	25,43	25,10	21,78	6,75
14,96	16,38	25,38	25,12	21,77	6,74
14,94	16,36	25,43	25,11	21,79	6,75
14,95	16,37	25,40	25,13	21,78	6,74
14,94	16,36	25,42	25,12	21,79	6,71
14,96	16,33	25,42	25,09	21,79	6,74
14,95	16,32	25,43	25,08	21,81	6,75
14,86	16,41	25,44	25,15	21,73	6,73
14,95	16,31	25,39	25,11	21,82	6,75
14,90	16,36	25,45	25,14	21,78	6,75
14,92	16,39	25,42	25,15	21,77	6,74
14,86	16,43	25,44	25,17	21,74	6,74
14,87	16,43	25,41	25,16	21,73	6,76
14,97	16,31	25,44	25,12	21,87	6,76
14,87	16,39	25,43	25,12	21,78	6,76
14,89	16,41	25,43	25,15	21,75	6,75
14,85	16,45	25,41	25,15	21,72	6,73
14,92	16,35	25,44	25,10	21,84	6,74
14,89	16,40	25,44	25,15	21,75	6,76
14,99	16,29	25,45	25,14	21,87	6,75
14,96	16,31	25,45	25,11	21,86	6,75
14,96	16,33	25,45	25,14	21,83	6,74
14,97	16,34	25,46	25,12	21,85	6,76
14,99	16,31	25,46	25,15	21,82	6,74
14,87	16,39	25,41	25,15	21,76	6,74
14,85	16,40	25,43	25,17	21,74	6,74
14,84	16,41	25,42	25,18	21,73	6,74
14,86	16,41	25,44	25,17	21,74	6,76
15,01	16,28	25,44	25,10	21,86	6,74
15,00	16,29	25,47	25,10	21,89	6,76
14,86	16,42	25,43	25,14	21,74	6,76
14,95	16,30	25,44	25,11	21,87	6,74
14,99	16,27	25,47	25,12	21,87	6,76
14,88	16,37	25,45	25,11	21,81	6,75
14,91	16,37	25,42	25,15	21,79	6,75
14,93	16,35	25,45	25,15	21,82	6,75
14,96	16,32	25,47	25,14	21,87	6,73
14,93	16,35	25,48	25,13	21,88	6,75
14,96	16,33	25,48	25,13	21,87	6,73
14,88	16,41	25,44	25,14	21,79	6,74
14,90	16,41	25,44	25,16	21,77	6,74
14,91	16,40	25,44	25,15	21,78	6,73
14,93	16,39	25,46	25,18	21,79	6,73
14,99	16,33	25,48	25,16	21,87	6,75
14,90	16,39	25,48	25,17	21,78	6,76
14,89	16,40	25,46	25,15	21,83	6,73
14,95	16,34	25,47	25,16	21,84	6,76
14,89	16,39	25,46	25,14	21,84	6,73

14,90	16,39	25,47	25,16	21,81	6,76
14,93	16,37	25,45	25,14	21,85	6,73
14,92	16,36	25,47	25,12	21,85	6,75
14,88	16,39	25,46	25,15	21,82	6,75
14,90	16,41	25,46	25,16	21,82	6,73
14,89	16,42	25,46	25,16	21,80	6,74
14,98	16,33	25,50	25,16	21,88	6,74
14,99	16,31	25,49	25,14	21,89	6,74
15,01	16,31	25,48	25,13	21,91	6,74
14,96	16,40	25,48	25,15	21,86	6,74
14,90	16,41	25,51	25,20	21,80	6,73
14,95	16,34	25,46	25,15	21,84	6,73
14,94	16,34	25,49	25,17	21,82	6,75
14,97	16,28	25,46	25,11	21,91	6,74
15,01	16,31	25,52	25,14	21,91	6,76
14,84	16,40	25,46	25,15	21,79	6,74
14,96	16,30	25,48	25,16	21,86	6,73
14,93	16,31	25,49	25,14	21,89	6,74
14,87	16,36	25,47	25,17	21,84	6,75
14,92	16,33	25,49	25,20	21,82	6,74
14,95	16,27	25,49	25,14	21,89	6,74
14,89	16,30	25,47	25,14	21,89	6,72
14,88	16,34	25,46	25,18	21,79	6,73
14,88	16,34	25,46	25,17	21,80	6,74
14,89	16,33	25,47	25,19	21,81	6,75
14,85	16,35	25,45	25,16	21,82	6,74
14,82	16,35	25,46	25,16	21,78	6,74
14,87	16,35	25,46	25,17	21,79	6,72
14,85	16,33	25,44	25,14	21,78	6,73
14,90	16,28	25,48	25,17	21,85	6,73
14,89	16,29	25,48	25,13	21,86	6,75
14,85	16,34	25,45	25,14	21,83	6,75
14,91	16,30	25,47	25,16	21,83	6,76
14,89	16,32	25,49	25,13	21,88	6,75
14,84	16,38	25,45	25,17	21,77	6,75
14,95	16,28	25,50	25,15	21,92	6,74
14,88	16,37	25,47	25,17	21,85	6,74
14,93	16,29	25,51	25,15	21,88	6,74
14,88	16,39	25,48	25,18	21,81	6,74
14,90	16,35	25,49	25,16	21,88	6,72
14,99	16,29	25,50	25,14	21,93	6,74
14,89	16,38	25,48	25,20	21,76	6,74
14,82	16,41	25,47	25,21	21,76	6,73
14,98	16,29	25,49	25,16	21,93	6,75
14,98	16,30	25,51	25,17	21,87	6,73
14,86	16,42	25,48	25,18	21,80	6,75
14,91	16,36	25,49	25,15	21,88	6,74
14,88	16,40	25,46	25,18	21,78	6,73

14,90	16,40	25,48	25,19	21,82	6,74
15,00	16,32	25,51	25,17	21,89	6,74
14,97	16,34	25,52	25,17	21,88	6,74
14,93	16,39	25,49	25,15	21,89	6,76
14,95	16,41	25,49	25,14	21,87	6,74
14,92	16,42	25,50	25,18	21,82	6,76
14,95	16,44	25,49	25,20	21,81	6,74
14,92	16,45	25,48	25,20	21,81	6,72
14,95	16,44	25,49	25,20	21,81	6,75
14,94	16,43	25,50	25,21	21,81	6,76
15,02	16,36	25,54	25,20	21,90	6,75
15,00	16,37	25,54	25,20	21,94	6,75
14,89	16,46	25,50	25,19	21,81	6,74
15,04	16,33	25,54	25,18	21,94	6,75
14,91	16,46	25,51	25,20	21,82	6,74
14,93	16,44	25,49	25,21	21,82	6,74
14,99	16,37	25,50	25,16	21,91	6,73
14,96	16,36	25,49	25,19	21,86	6,74
14,95	16,41	25,51	25,21	21,85	6,74
14,96	16,36	25,47	25,15	21,88	6,73
14,93	16,34	25,49	25,14	21,89	6,72
14,93	16,36	25,48	25,15	21,87	6,75
14,95	16,35	25,47	25,17	21,86	6,74
14,93	16,37	25,51	25,16	21,88	6,74
14,94	16,38	25,49	25,15	21,86	6,74
14,95	16,36	25,51	25,16	21,88	6,74
14,95	16,40	25,50	25,22	21,85	6,72
14,93	16,42	25,52	25,19	21,86	6,75
14,93	16,38	25,52	25,18	21,87	6,75
14,98	16,37	25,49	25,17	21,90	6,74
14,99	16,35	25,49	25,18	21,90	6,72
14,96	16,33	25,49	25,17	21,90	6,73
14,95	16,37	25,53	25,19	21,87	6,74
14,96	16,40	25,53	25,21	21,87	6,74
14,94	16,43	25,50	25,20	21,84	6,73
14,95	16,44	25,54	25,21	21,86	6,74
15,03	16,35	25,50	25,17	21,95	6,74
14,94	16,44	25,52	25,20	21,87	6,73
14,91	16,45	25,53	25,22	21,85	6,76
14,93	16,43	25,52	25,21	21,89	6,76
15,04	16,34	25,55	25,17	21,96	6,77
14,97	16,44	25,52	25,20	21,90	6,75
14,95	16,42	25,55	25,22	21,89	6,74
15,06	16,34	25,52	25,20	21,96	6,72
15,05	16,36	25,55	25,19	21,96	6,75
14,95	16,44	25,50	25,20	21,87	6,75
14,98	16,41	25,52	25,20	21,92	6,75
14,99	16,43	25,56	25,26	21,90	6,74

14,94	16,46	25,50	25,23	21,88	6,75
15,01	16,45	25,53	25,20	21,93	6,72
15,02	16,45	25,55	25,21	21,95	6,75
15,05	16,42	25,58	25,23	21,95	6,75
15,00	16,46	25,55	25,22	21,93	6,73

Flow-D - [ln/min]	NS-Røgten	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1	Ovf-Side-2	Ovf-Bund - [°C]	Kanal-EPA	Røgtræk - [Pa]	
	13	24	27	28	29	30	31	36	38
Split train flow rate	EPA Flue gas temperatur	Surface temperatur Top	Surface temperatur Rear	Surface temperatur Right side	Surface temperatur Left side	Surface temperatur Bottom	EPA Duct temperatur	Flue draft Pascals	
Flow-D - [ln/min]									
6,46	182,79	310,01	230,17	239,99	264,63	214,43	39,25	19,13	
6,60	167,75	301,40	231,20	240,30	263,79	215,27	45,32	17,96	
6,60	187,18	295,93	232,40	240,85	262,67	216,02	47,82	16,82	
6,77	207,03	296,77	233,56	240,93	261,38	216,95	45,27	17,67	
6,78	200,89	301,16	234,47	240,77	260,31	217,79	42,96	16,72	
6,75	178,29	306,10	235,07	240,60	259,30	218,75	40,82	16,31	
6,76	164,14	310,50	235,60	240,09	258,81	219,56	38,91	15,69	
6,74	158,62	314,31	235,73	239,65	258,40	220,41	37,38	15,12	
6,73	155,38	317,74	235,67	239,15	258,01	221,10	36,33	15,10	
6,72	153,86	320,68	235,39	238,55	257,54	221,79	35,49	14,81	
6,73	152,15	323,69	234,94	237,93	257,15	222,31	34,87	14,61	
6,74	150,41	326,43	234,28	237,24	256,59	222,78	34,43	14,38	
6,72	149,91	329,24	233,55	236,57	256,21	223,19	34,03	14,28	
6,72	149,29	331,74	232,53	235,69	255,52	223,41	33,59	14,34	
6,70	148,20	333,93	231,53	234,82	255,08	223,52	33,21	14,06	
6,72	146,46	335,42	230,44	233,89	254,47	223,56	32,90	13,91	
6,72	144,04	336,78	229,22	232,97	253,97	223,46	32,79	14,04	
6,70	142,89	337,82	227,91	232,04	253,39	223,24	32,60	13,81	
6,70	141,77	338,72	226,64	231,07	252,76	223,04	32,50	13,44	
6,72	140,09	338,97	225,30	230,15	252,13	222,73	32,37	13,72	
6,71	139,75	339,40	223,92	229,03	251,50	222,26	32,28	13,21	
6,70	136,71	339,42	222,51	227,96	250,81	221,80	32,20	13,48	
6,71	136,38	339,48	221,08	226,94	250,12	221,34	32,15	13,44	
6,71	135,55	339,27	219,65	225,80	249,36	220,78	32,08	13,74	
6,72	135,21	339,15	218,19	224,73	248,60	220,22	31,99	13,08	
6,73	133,81	338,78	216,76	223,55	247,95	219,57	31,88	13,56	
6,70	133,43	338,48	215,34	222,55	247,25	218,96	31,76	13,21	
6,71	132,33	338,24	213,97	221,46	246,56	218,20	31,64	13,33	
6,70	130,84	337,84	212,52	220,54	245,73	217,50	31,52	13,28	
6,72	130,07	337,08	211,11	219,54	244,97	216,78	31,55	13,19	
6,71	129,92	336,38	209,69	218,43	244,19	215,84	31,39	13,43	
6,68	129,62	335,95	208,29	217,33	243,40	215,04	31,19	13,15	
6,68	128,50	335,60	206,90	216,33	242,78	214,23	31,09	12,87	
6,71	128,81	334,98	205,54	215,42	241,87	213,43	31,12	12,84	
6,69	127,68	334,51	204,24	214,32	241,21	212,58	31,06	12,78	
6,69	127,06	334,03	202,93	213,41	240,41	211,86	31,04	12,75	
6,69	126,57	333,29	201,62	212,49	239,64	210,94	30,98	13,14	
6,70	126,19	332,90	200,36	211,66	238,90	210,15	30,94	12,59	
6,68	125,20	332,26	199,15	210,73	238,15	209,30	30,96	12,81	
6,70	124,13	331,86	197,90	209,83	237,43	208,45	30,97	12,69	
6,69	124,05	331,38	196,71	209,07	236,69	207,61	30,97	12,50	
6,69	124,20	330,64	195,54	208,18	236,07	206,73	30,88	12,47	
6,69	123,82	330,05	194,40	207,32	235,47	205,94	30,74	12,52	

6,69	123,52	329,65	193,22	206,51	234,82	205,07	30,59	12,48
6,69	124,16	329,16	192,18	205,74	234,20	204,22	30,45	12,44
6,69	122,87	328,89	191,07	204,97	233,76	203,36	30,45	12,52
6,69	122,64	328,39	189,98	204,34	233,23	202,64	30,45	12,48
6,71	123,16	328,39	188,96	203,62	232,74	201,75	30,49	12,47
6,72	123,51	328,38	187,96	203,05	232,26	201,06	30,52	12,90
6,72	123,41	328,55	186,97	202,42	231,91	200,28	30,47	12,46
6,73	123,48	328,77	185,99	201,75	231,50	199,53	30,42	12,40
6,70	123,54	328,83	185,00	201,13	231,16	198,80	30,39	12,48
6,71	123,20	329,36	184,15	200,61	230,82	198,06	30,39	12,67
6,72	123,34	329,93	183,30	200,08	230,76	197,37	30,36	12,26
6,69	122,59	330,30	182,34	199,62	230,58	196,73	30,34	12,79
6,70	123,04	330,78	181,49	199,20	230,41	196,00	30,31	12,48
6,71	123,11	331,08	180,68	198,85	230,49	195,25	30,37	12,49
6,70	122,48	331,53	179,85	198,51	230,43	194,58	30,40	12,16
6,72	122,77	331,89	179,05	198,22	230,37	193,94	30,39	12,43
6,70	122,87	332,58	178,28	197,87	230,38	193,24	30,40	12,15
6,69	123,07	333,15	177,59	197,47	230,51	192,48	30,36	12,27
6,70	123,38	333,99	176,86	197,11	230,75	191,85	30,34	12,29
6,69	123,20	334,81	176,14	196,90	230,87	191,21	30,30	12,33
6,70	123,88	335,80	175,46	196,75	231,12	190,54	30,25	12,66
6,69	123,87	336,34	174,78	196,58	231,37	189,98	30,24	12,14
6,68	123,13	337,19	174,15	196,38	231,61	189,38	30,24	12,25
6,68	124,37	338,39	173,52	196,27	232,04	188,67	30,31	12,42
6,66	124,41	339,42	172,96	196,16	232,36	188,07	30,38	12,25
6,68	124,39	340,70	172,34	196,17	232,81	187,51	30,43	12,23
6,68	124,17	341,73	171,79	196,10	233,20	187,03	30,43	12,44
6,65	124,94	343,14	171,22	196,13	233,78	186,42	30,46	12,49
6,64	126,29	344,32	170,73	196,08	234,26	185,88	30,47	12,09
6,67	125,45	345,62	170,24	195,97	234,86	185,31	30,39	12,65
6,65	125,26	347,25	169,75	196,10	235,42	184,85	30,36	12,41
6,64	125,74	348,84	169,29	196,13	236,16	184,33	30,37	12,52
6,64	126,79	350,28	168,79	196,13	236,78	183,84	30,35	12,52
6,72	127,76	351,87	168,36	196,24	237,43	183,41	30,37	12,73
6,71	127,18	353,51	167,95	196,23	238,08	182,99	30,39	12,75
6,71	128,27	355,11	167,54	196,40	239,03	182,57	30,34	13,13
6,67	128,22	356,40	167,17	196,41	239,62	182,15	30,35	12,62
6,69	127,65	358,32	166,81	196,59	240,60	181,68	30,32	12,71
6,68	127,52	360,02	166,43	196,76	241,35	181,28	30,31	13,00
6,68	128,38	361,53	166,10	196,98	242,07	180,97	30,32	12,79
6,68	128,55	363,41	165,78	197,20	242,87	180,59	30,40	12,75
6,68	129,12	364,77	165,46	197,48	243,65	180,28	30,49	12,66
6,66	130,00	366,21	165,23	197,74	244,40	179,94	30,49	12,64
6,64	130,07	367,77	164,92	198,04	245,05	179,70	30,50	12,88
6,65	129,56	369,11	164,69	198,37	245,93	179,35	30,52	13,05
6,64	130,82	370,72	164,46	198,62	246,68	179,00	30,55	12,80
6,65	130,52	372,09	164,24	198,97	247,46	178,75	30,57	12,75
6,66	130,06	373,61	164,04	199,20	248,11	178,48	30,60	12,81

6,65	130,32	375,12	163,88	199,49	248,92	178,13	30,68	12,71
6,81	130,70	376,46	163,68	199,72	249,52	177,91	30,62	12,64
6,77	130,69	377,55	163,50	199,91	250,31	177,63	30,64	12,87
6,78	130,24	378,72	163,37	200,24	250,98	177,44	30,52	12,92
6,78	131,07	379,90	163,26	200,50	251,72	177,18	30,50	12,62
6,77	131,34	380,98	163,11	200,96	252,25	177,07	30,56	12,61
6,77	132,37	382,45	162,98	201,33	252,89	176,85	30,56	12,78
6,79	131,66	383,13	162,92	201,71	253,56	176,65	30,57	12,95
6,76	132,91	384,28	162,82	202,09	254,11	176,44	30,65	12,59
6,78	131,85	385,04	162,83	202,43	254,71	176,23	30,67	12,44
6,76	131,92	386,27	162,74	202,88	255,27	176,09	30,65	12,70
6,76	132,17	387,17	162,72	203,27	255,85	175,97	30,67	12,64
6,77	131,20	388,06	162,72	203,69	256,33	175,83	30,75	12,84
6,75	131,30	388,71	162,72	204,10	256,91	175,70	30,68	12,82
6,76	131,35	389,44	162,74	204,51	257,45	175,56	30,57	12,78
6,74	131,31	390,04	162,74	204,89	257,93	175,52	30,47	12,83
6,76	130,53	390,18	162,78	205,28	258,45	175,41	30,47	12,92
6,75	131,43	390,84	162,87	205,61	258,73	175,38	30,49	12,85
6,72	131,27	391,45	162,96	206,03	259,35	175,26	30,57	12,78
6,76	131,31	391,87	163,01	206,44	259,75	175,17	30,66	12,83
6,74	132,57	392,41	163,13	206,72	260,23	175,05	30,72	12,50
6,75	130,78	392,90	163,20	207,10	260,69	175,01	30,70	12,49
6,73	131,64	393,51	163,33	207,46	261,06	174,96	30,76	12,48
6,75	131,14	393,82	163,48	207,77	261,37	174,91	30,73	12,82
6,75	130,40	394,36	163,65	208,13	261,90	174,93	30,76	12,58
6,74	130,92	394,76	163,78	208,55	262,37	174,93	30,71	12,74
6,74	131,18	395,29	163,98	208,93	262,74	174,95	30,74	12,74
6,73	132,01	395,66	164,15	209,32	263,22	174,95	30,75	12,93
6,75	131,75	395,91	164,33	209,62	263,53	174,96	30,71	12,73
8,37	132,02	396,43	164,56	209,90	263,99	174,96	30,66	12,47
6,70	131,88	396,70	164,76	210,29	264,60	174,97	30,53	12,72
6,69	133,02	397,36	165,00	210,59	264,93	174,98	30,50	12,92
6,72	132,28	397,46	165,26	210,88	265,34	175,05	30,35	12,77
6,70	132,49	398,00	165,51	211,22	265,90	175,13	30,24	12,78
6,70	132,08	398,31	165,80	211,47	266,18	175,16	30,33	12,93
6,68	131,34	398,77	166,06	211,88	266,76	175,20	30,24	13,02
6,70	131,12	399,41	166,38	212,14	267,20	175,23	30,31	12,59
6,70	130,98	399,86	166,73	212,44	267,37	175,33	30,43	12,73
6,69	130,96	399,80	167,09	212,82	267,94	175,40	30,36	12,68
6,66	128,56	399,30	167,42	213,21	268,24	175,50	30,34	12,21
6,67	126,90	398,56	167,79	213,49	268,41	175,49	30,41	12,56
6,67	126,31	396,87	168,16	213,77	268,51	175,64	30,42	12,23
6,64	124,38	395,03	168,58	213,94	268,77	175,69	30,40	11,86
6,79	123,28	392,47	169,00	214,31	268,73	175,83	30,41	12,09
6,76	122,67	389,84	169,46	214,49	268,59	175,90	30,33	11,98
6,75	121,71	387,68	169,85	214,63	268,44	176,03	30,16	12,30
6,75	121,42	385,46	170,33	214,88	268,30	176,19	30,16	11,71
6,75	120,63	383,39	170,88	214,97	268,04	176,28	30,14	11,79

6,76	120,80	381,50	171,37	215,04	267,97	176,41	30,07	11,57
6,75	119,57	379,55	171,93	215,24	267,70	176,52	29,99	11,86
6,74	119,34	377,67	172,47	215,45	267,45	176,65	29,87	11,44
6,74	119,09	375,92	173,07	215,49	267,30	176,75	29,79	11,26
6,73	118,17	373,92	173,65	215,66	267,03	176,93	29,86	11,51
6,74	117,44	372,20	174,25	215,70	266,87	177,02	29,75	11,23
6,73	116,42	370,40	174,83	215,82	266,52	177,16	29,80	11,54
6,71	115,24	368,37	175,44	215,89	266,18	177,32	29,76	11,40
6,70	115,02	366,65	176,07	216,02	266,02	177,38	29,71	11,00
6,68	114,12	364,66	176,69	216,10	265,65	177,48	29,68	11,00
6,66	114,18	362,50	177,29	216,00	265,33	177,62	29,59	11,18
6,65	112,44	360,69	177,92	216,10	265,15	177,70	29,53	10,85
6,65	111,89	358,57	178,51	216,12	264,69	177,81	29,57	11,13
6,63	111,20	356,80	179,07	216,27	264,26	177,97	29,52	10,88
6,61	110,80	354,47	179,64	216,26	263,81	178,16	29,52	10,69
6,64	108,74	352,31	180,28	216,23	263,61	178,21	29,44	10,72
6,61	107,91	349,80	180,85	216,26	263,10	178,37	29,46	10,47
6,60	107,07	347,42	181,46	216,17	262,64	178,52	29,47	10,42
6,62	106,02	344,88	182,06	216,13	262,28	178,62	29,35	10,39
6,61	105,92	342,37	182,68	216,17	261,77	178,88	29,28	10,64
6,59	105,08	339,67	183,32	216,23	261,21	179,03	29,27	10,20
6,62	104,35	337,12	183,99	216,22	260,66	179,18	29,28	10,05
6,68	103,23	334,37	184,61	216,24	260,03	179,31	29,29	10,06
6,68	102,77	331,99	185,37	216,10	259,48	179,41	29,28	10,14
6,67	101,84	329,78	186,05	215,93	258,89	179,53	29,22	10,03
6,67	101,08	327,59	186,71	215,87	258,24	179,69	29,02	9,80
6,69	100,27	325,36	187,43	215,68	257,60	179,87	29,00	9,65
6,67	99,65	323,09	188,11	215,63	257,00	180,08	29,03	9,57
6,66	98,20	321,03	188,78	215,42	256,32	180,24	29,10	9,60
6,66	98,04	318,85	189,43	215,37	255,56	180,40	28,98	9,59
6,66	97,18	316,95	190,09	215,30	254,90	180,51	28,94	9,37
6,66	96,81	315,16	190,73	215,06	254,15	180,64	28,93	9,34
6,66	95,84	313,29	191,40	214,97	253,44	180,79	28,93	9,45
6,66	95,44	311,40	192,06	214,74	252,69	180,94	28,79	9,54
6,67	94,54	309,85	192,67	214,47	251,95	181,10	28,80	9,58
6,67	93,32	308,07	193,27	214,33	251,18	181,29	28,74	9,14
6,66	93,63	306,41	193,86	214,15	250,57	181,45	28,65	9,21
6,65	93,48	304,82	194,44	213,87	249,80	181,53	28,66	9,19
6,65	92,54	303,06	195,04	213,77	249,02	181,76	28,61	8,97
6,64	92,03	301,44	195,60	213,55	248,42	181,80	28,59	9,18
6,66	91,63	300,06	196,11	213,41	247,71	181,94	28,55	8,77
6,65	90,90	298,58	196,63	213,35	247,10	182,12	28,56	8,80
6,64	90,21	297,12	197,19	213,29	246,38	182,19	28,54	8,97
6,65	90,27	295,98	197,70	213,27	245,72	182,37	28,54	8,82
6,67	89,75	294,65	198,17	213,05	244,99	182,55	28,44	8,68
6,65	89,22	293,49	198,64	212,88	244,42	182,57	28,46	8,64
6,66	89,49	292,54	199,05	212,83	243,81	182,78	28,42	8,94
6,65	89,24	291,63	199,53	212,71	243,30	182,86	28,35	8,99

6,65	88,53	290,88	199,95	212,51	242,67	182,90	28,29	8,74
6,65	88,26	289,91	200,33	212,39	242,12	183,07	28,23	8,70
6,65	87,09	288,75	200,72	212,20	241,55	183,19	28,16	8,66
6,64	86,68	287,83	201,12	212,03	241,18	183,26	27,99	8,19
6,65	85,90	286,39	201,42	212,14	240,55	183,55	28,01	8,19
6,64	84,24	285,22	201,78	212,07	240,15	183,56	28,03	8,29
6,65	84,15	283,70	202,08	212,18	239,62	183,71	28,05	8,41
6,66	83,78	282,00	202,41	212,03	238,95	183,84	28,03	8,31
6,66	82,49	280,67	202,68	211,92	238,35	183,95	27,90	8,48
6,65	81,81	278,88	203,00	211,59	237,66	184,05	27,85	8,01
6,66	81,77	277,41	203,21	211,50	237,17	184,12	27,73	7,91
6,65	81,27	275,68	203,46	211,32	236,46	184,14	27,70	7,75
6,66	80,21	273,85	203,64	211,07	235,70	184,19	27,61	7,78
6,63	79,37	271,63	203,88	210,77	235,02	184,31	27,60	7,73
6,65	78,76	269,54	204,06	210,48	234,38	184,25	27,60	7,53
6,64	77,17	267,28	204,24	210,18	233,60	184,33	27,51	7,47
6,65	76,93	264,81	204,36	209,74	232,51	184,38	27,49	7,47
6,65	76,33	262,52	204,46	209,46	231,70	184,41	27,45	7,38
6,64	75,91	259,95	204,58	208,87	230,71	184,44	27,41	7,26
6,65	75,05	257,54	204,66	208,41	229,81	184,40	27,30	7,17
6,65	75,08	254,95	204,68	207,84	228,77	184,47	27,21	7,36
6,64	73,95	252,66	204,72	207,27	227,73	184,53	27,13	7,19
6,65	73,88	250,11	204,74	206,61	226,69	184,55	27,11	7,25
6,66	72,90	247,68	204,72	205,99	225,53	184,62	27,05	6,97
6,65	72,02	245,26	204,67	205,25	224,47	184,69	27,01	7,03
6,64	71,71	243,05	204,60	204,64	223,36	184,74	27,00	6,82
6,64	71,45	240,75	204,52	203,97	222,29	184,74	26,99	6,68
6,64	71,44	238,60	204,43	203,32	221,27	184,72	26,97	6,66
6,66	70,67	236,42	204,29	202,63	220,17	184,72	26,92	6,55
6,65	69,89	234,33	204,18	201,89	219,20	184,65	26,91	6,83
6,64	69,45	232,24	204,08	201,19	218,07	184,67	26,81	6,60
6,66	68,84	230,17	203,93	200,44	217,07	184,68	26,72	6,54
6,66	68,63	228,09	203,80	199,66	216,01	184,66	26,71	6,64
6,64	68,27	226,16	203,66	198,65	215,08	184,59	26,63	6,38
6,66	67,73	224,28	203,44	197,91	213,91	184,63	26,57	6,38
6,66	67,30	222,66	203,28	197,16	213,00	184,51	26,55	6,42
6,65	66,97	220,75	203,08	196,36	212,01	184,49	26,56	6,33
6,65	66,46	218,80	202,89	195,64	210,99	184,45	26,51	6,30
6,67	66,30	217,00	202,68	194,82	210,04	184,36	26,49	6,08
6,65	65,74	215,31	202,42	193,99	209,05	184,37	26,39	6,31
6,66	65,07	213,74	202,24	193,19	208,17	184,25	26,31	5,87
6,64	64,81	212,14	201,98	192,47	207,33	184,22	26,30	5,98
6,64	64,41	210,58	201,70	191,69	206,20	184,22	26,30	6,04
6,64	64,25	209,00	201,49	190,95	205,35	184,14	26,25	5,86
6,66	63,64	207,63	201,23	190,27	204,45	184,24	26,22	6,12
6,66	63,48	205,98	201,00	189,49	203,59	184,06	26,18	6,02
6,64	63,09	204,58	200,76	188,87	202,80	184,01	26,20	5,74
6,65	63,04	203,07	200,51	188,20	201,87	183,93	26,25	5,88

6,66	62,33	201,67	200,24	187,46	200,96	183,93	26,22	5,63
6,64	62,15	200,44	199,93	186,64	200,13	183,83	26,16	5,78
6,64	61,51	199,48	199,68	186,07	199,39	183,86	26,16	5,53
6,66	61,24	198,20	199,39	185,41	198,55	183,88	26,17	5,34
6,62	60,86	197,03	199,11	184,71	197,80	183,82	26,17	5,74
6,66	60,27	195,84	198,82	183,97	196,96	183,73	26,19	5,37
6,66	59,88	194,72	198,47	183,25	196,16	183,63	26,14	5,50
6,63	59,77	193,65	198,15	182,62	195,46	183,59	26,10	5,30
6,66	59,24	192,50	197,78	181,96	194,66	183,45	26,04	5,32
6,63	59,25	191,41	197,49	181,27	193,96	183,42	25,97	5,25
6,64	59,03	190,58	197,13	180,67	193,30	183,28	25,95	5,25
6,66	58,63	189,46	196,81	180,11	192,49	183,25	25,92	5,08
6,64	58,77	188,43	196,48	179,42	191,76	183,19	25,88	5,14
6,65	58,21	187,53	196,17	178,81	191,04	183,15	25,81	5,37
6,64	57,94	186,60	195,82	178,11	190,47	183,06	25,80	5,11
6,67	57,36	185,64	195,45	177,61	189,73	183,01	25,80	4,99
6,66	57,30	184,80	195,08	176,95	189,16	182,89	25,78	4,85
6,66	56,84	183,81	194,65	176,32	188,45	182,77	25,76	5,04
6,65	56,52	182,96	194,29	175,79	187,90	182,58	25,70	4,84
6,66	56,48	181,85	193,92	175,18	187,21	182,53	25,66	4,79
6,65	56,28	181,29	193,52	174,52	186,61	182,37	25,58	4,79
6,66	56,03	180,22	193,15	173,93	185,96	182,29	25,59	4,89
6,66	55,36	179,61	192,80	173,46	185,41	182,13	25,54	4,82
6,66	55,01	178,75	192,40	172,89	184,77	182,04	25,59	5,06
6,67	54,87	178,06	192,04	172,42	184,21	181,89	25,59	4,65
6,66	54,58	177,27	191,63	171,87	183,61	181,79	25,58	4,79
6,67	54,46	176,53	191,23	171,37	183,01	181,59	25,61	4,85
6,65	54,72	175,82	190,83	170,87	182,49	181,47	25,51	4,65
6,66	54,20	175,11	190,46	170,41	181,87	181,38	25,50	4,51
6,66	54,01	174,42	190,11	169,92	181,48	181,16	25,45	4,69
6,66	53,89	173,71	189,72	169,45	180,99	180,98	25,50	4,64
6,63	53,61	172,98	189,33	168,94	180,43	180,88	25,50	4,62
6,66	53,05	172,34	188,94	168,44	179,88	180,70	25,44	4,48
6,66	52,66	171,56	188,53	167,95	179,39	180,54	25,38	4,85
6,65	52,64	170,95	188,15	167,44	178,87	180,32	25,36	4,35
6,65	52,64	170,23	187,78	166,98	178,43	180,20	25,34	4,37
6,67	52,32	169,58	187,40	166,53	177,99	179,99	25,33	4,32
6,64	52,18	168,90	186,99	166,01	177,46	179,85	25,39	4,35
6,66	51,87	168,46	186,62	165,69	177,05	179,66	25,39	4,36
6,67	51,76	167,72	186,25	165,21	176,55	179,40	25,39	4,19
6,67	51,70	167,14	185,87	164,89	176,03	179,19	25,35	4,29
6,69	51,19	166,63	185,49	164,48	175,43	179,07	25,35	4,24
6,67	51,09	166,06	185,09	163,97	175,07	178,81	25,39	4,41
6,69	50,67	165,65	184,73	163,56	174,61	178,58	25,35	4,24
6,67	50,83	164,98	184,31	163,13	174,11	178,44	25,27	4,33
6,66	50,85	164,34	183,98	162,61	173,70	178,28	25,21	3,99
6,69	50,54	163,90	183,59	162,22	173,33	178,04	25,21	4,08
6,67	50,45	163,44	183,17	161,79	172,78	177,92	25,18	4,04

6,65	50,09	162,91	182,79	161,32	172,44	177,70	25,14	4,23
6,67	49,85	162,47	182,38	160,94	172,01	177,41	25,13	4,07
6,66	49,85	161,76	182,06	160,49	171,61	177,23	25,08	3,95
6,67	49,66	161,37	181,67	160,04	171,24	177,05	25,07	4,10
6,67	49,37	160,94	181,33	159,60	170,85	176,87	25,07	4,06
6,67	48,98	160,45	180,89	159,21	170,52	176,62	25,07	4,06
6,69	49,13	160,07	180,54	158,84	170,03	176,41	25,06	4,10
6,69	48,96	159,49	180,20	158,37	169,67	176,21	25,05	4,12
6,66	48,59	159,16	179,82	157,98	169,23	176,03	24,98	3,71
6,69	48,60	158,71	179,41	157,62	168,85	175,87	24,94	3,90
6,67	48,52	158,08	179,09	157,14	168,52	175,61	24,94	4,02
6,67	48,49	157,74	178,70	156,77	168,12	175,41	24,91	3,94
6,67	48,30	157,26	178,33	156,45	167,72	175,28	24,93	3,99
6,68	48,14	156,71	178,00	156,05	167,42	175,06	24,93	3,79
6,69	47,79	156,33	177,62	155,68	166,95	174,91	24,91	3,96
6,67	47,79	155,86	177,28	155,26	166,68	174,60	24,90	3,90
6,67	47,49	155,43	176,89	154,90	166,28	174,46	24,87	3,67
6,69	47,57	155,04	176,57	154,55	165,98	174,23	24,88	3,88
6,69	47,56	154,58	176,14	154,23	165,54	174,09	24,85	3,39
6,67	47,46	154,10	175,85	153,86	165,17	173,84	24,88	3,85
6,70	47,07	153,76	175,48	153,53	164,87	173,58	24,88	3,68
6,68	46,75	153,44	175,18	153,14	164,55	173,34	24,92	3,62
6,68	46,64	153,19	174,83	152,87	164,18	173,15	24,95	3,66
6,67	46,57	152,73	174,50	152,57	163,79	173,05	24,99	3,50
6,66	46,42	152,43	174,19	152,18	163,47	172,76	24,95	3,62
6,67	46,20	151,84	173,87	151,96	163,12	172,55	24,96	3,69
6,67	46,05	151,42	173,54	151,69	162,78	172,35	24,93	3,69
6,69	46,27	150,95	173,19	151,37	162,39	172,15	24,90	3,53
6,69	46,22	150,59	172,84	151,01	162,01	171,92	24,88	3,71
6,68	45,88	150,33	172,52	150,68	161,76	171,76	24,86	3,71
6,67	45,84	149,94	172,18	150,43	161,50	171,57	24,85	3,63
6,67	45,49	149,65	171,85	150,13	161,09	171,39	24,77	3,60
6,68	45,55	149,36	171,55	149,76	160,85	171,18	24,75	3,61
6,69	45,50	148,76	171,24	149,42	160,56	171,01	24,74	3,62
6,67	45,33	148,64	170,90	149,12	160,24	170,80	24,72	3,34
6,66	45,05	148,24	170,57	148,80	159,86	170,61	24,66	3,32
6,69	45,06	148,04	170,25	148,54	159,63	170,44	24,61	3,57
6,70	44,99	147,70	169,92	148,18	159,38	170,19	24,60	3,38
6,69	44,90	147,35	169,59	147,95	159,02	170,01	24,61	3,38
6,69	44,54	147,07	169,25	147,66	158,79	169,81	24,61	3,44
6,68	44,57	146,65	168,97	147,29	158,44	169,61	24,61	3,43
6,70	44,62	146,35	168,65	147,00	158,16	169,43	24,57	3,38
6,68	44,52	145,93	168,35	146,63	157,86	169,19	24,61	3,38
6,70	44,58	145,59	168,01	146,38	157,58	169,08	24,56	3,44
6,70	44,19	145,34	167,73	146,05	157,32	168,83	24,54	3,30
6,69	44,34	144,90	167,41	145,74	157,07	168,60	24,49	3,50
6,69	44,03	144,54	167,12	145,44	156,72	168,39	24,52	3,24
6,69	43,62	144,34	166,81	145,22	156,51	168,21	24,53	3,22

6,68	43,78	143,88	166,52	144,92	156,17	168,05	24,50	3,44
6,69	43,56	143,71	166,23	144,69	155,94	167,82	24,52	3,27
6,68	43,76	143,31	165,94	144,37	155,65	167,68	24,54	3,33
6,70	43,31	143,09	165,60	144,09	155,46	167,47	24,49	3,32
6,70	43,20	142,84	165,34	143,78	155,13	167,30	24,49	3,19
6,69	43,34	142,64	165,04	143,59	154,95	167,14	24,45	3,21
6,71	43,10	142,28	164,74	143,36	154,61	167,01	24,43	3,24
6,68	43,02	142,09	164,44	143,10	154,42	166,84	24,39	3,12
6,71	43,22	141,98	164,17	142,82	154,16	166,64	24,40	3,12
6,70	42,81	141,61	163,83	142,54	153,88	166,48	24,39	3,08
6,69	42,67	141,47	163,48	142,28	153,58	166,37	24,38	3,16
6,69	42,87	141,14	163,27	141,99	153,50	166,18	24,37	3,00
6,70	42,92	140,95	162,97	141,77	153,20	166,03	24,38	2,93
6,70	42,92	140,59	162,72	141,52	152,99	165,89	24,41	3,01
6,70	42,47	140,31	162,44	141,24	152,73	165,67	24,41	3,28
6,70	42,13	140,12	162,17	141,08	152,52	165,50	24,42	3,01
6,69	42,12	139,77	161,87	140,87	152,26	165,44	24,41	3,25
6,71	42,09	139,53	161,63	140,65	151,98	165,28	24,39	3,23
6,72	41,95	139,19	161,33	140,41	151,75	165,15	24,42	3,17
6,70	42,27	139,08	161,07	140,18	151,55	164,90	24,41	3,22
6,71	42,13	138,85	160,85	139,96	151,34	164,80	24,33	3,36
6,70	42,15	138,67	160,56	139,81	151,09	164,69	24,34	2,97
6,69	42,01	138,44	160,28	139,56	150,78	164,62	24,30	2,94
6,71	41,83	138,34	159,99	139,31	150,64	164,42	24,30	2,93
6,70	41,76	138,17	159,77	139,08	150,48	164,24	24,29	3,13
6,71	41,64	137,82	159,50	138,84	150,18	164,15	24,28	3,16
6,71	41,76	137,69	159,29	138,62	150,05	163,95	24,29	3,12
6,69	41,40	137,42	158,98	138,45	149,85	163,86	24,27	3,06
6,72	41,26	137,18	158,75	138,24	149,63	163,70	24,30	3,03
6,71	41,21	136,97	158,49	138,09	149,49	163,50	24,30	2,95
6,73	41,26	136,76	158,23	137,90	149,27	163,34	24,29	3,03
6,71	41,26	136,55	158,00	137,63	149,05	163,16	24,28	3,00
6,71	40,98	136,38	157,73	137,46	148,86	163,02	24,24	2,99
6,73	41,13	136,20	157,48	137,28	148,68	162,87	24,20	2,79
6,70	40,90	136,01	157,25	137,08	148,51	162,69	24,19	2,96
6,72	41,04	135,76	157,02	136,88	148,29	162,55	24,19	3,02
6,70	40,99	135,45	156,73	136,61	148,10	162,32	24,20	3,12
6,72	40,89	135,24	156,52	136,53	147,86	162,19	24,21	2,92
6,71	41,08	135,18	156,28	136,28	147,70	161,95	24,19	3,00
6,73	40,88	134,87	156,07	136,06	147,49	161,79	24,19	2,80
6,73	40,72	134,68	155,83	135,98	147,30	161,67	24,23	2,93
6,71	40,72	134,63	155,62	135,77	147,09	161,48	24,24	2,89
6,73	40,59	134,42	155,39	135,58	146,92	161,37	24,23	2,79
6,71	40,34	134,14	155,14	135,48	146,77	161,25	24,24	2,77
6,71	40,15	133,89	154,97	135,34	146,52	161,12	24,26	2,82
6,73	40,18	133,67	154,75	135,19	146,34	160,93	24,27	2,62
6,73	40,20	133,50	154,56	135,03	146,14	160,78	24,28	3,11
6,73	39,99	133,32	154,36	134,91	145,96	160,70	24,29	2,78

6,70	39,91	132,97	154,18	134,68	145,79	160,54	24,27	2,86
6,72	39,81	132,77	153,92	134,55	145,61	160,37	24,27	2,83
6,73	40,03	132,48	153,71	134,30	145,47	160,19	24,25	2,71
6,73	40,05	132,49	153,49	134,18	145,25	160,09	24,18	2,83
6,71	39,99	132,22	153,28	134,04	145,09	159,88	24,18	2,98
6,70	40,00	132,10	153,08	133,84	144,92	159,78	24,14	2,90
6,72	39,83	131,94	152,87	133,69	144,70	159,65	24,15	2,93
6,74	39,68	131,99	152,68	133,61	144,62	159,48	24,13	2,54
6,72	39,57	131,90	152,51	133,50	144,51	159,33	24,12	2,70
6,72	39,42	131,65	152,30	133,26	144,35	159,21	24,12	2,80
6,73	39,29	131,43	152,08	133,09	144,08	159,05	24,10	2,74
6,71	39,58	131,14	151,89	132,88	143,99	158,92	24,10	2,86
6,71	39,58	131,17	151,67	132,73	143,84	158,75	24,08	2,83
6,73	39,64	130,98	151,51	132,58	143,53	158,72	24,02	2,85
6,73	39,42	130,87	151,32	132,43	143,42	158,49	24,00	2,68
6,72	39,30	130,75	151,17	132,24	143,34	158,35	24,00	2,82
6,74	39,22	130,53	150,98	132,05	143,13	158,19	24,03	2,61
6,72	39,13	130,28	150,75	131,83	143,02	157,94	24,01	2,74
6,72	39,04	130,18	150,56	131,73	142,83	157,85	24,03	2,75
6,73	39,18	130,07	150,40	131,57	142,73	157,69	24,02	2,85
6,73	39,10	129,93	150,23	131,52	142,55	157,56	24,00	2,60
6,73	38,81	129,65	150,09	131,38	142,37	157,49	24,00	2,68
6,74	38,49	129,50	149,92	131,21	142,28	157,26	24,00	2,66
6,71	38,78	129,30	149,75	131,05	142,06	157,18	23,98	2,61
6,75	38,90	129,17	149,62	130,85	142,01	157,01	23,98	2,61
6,72	38,45	129,06	149,42	130,73	141,80	156,98	24,03	2,75
6,72	38,48	128,88	149,27	130,64	141,75	156,84	24,05	2,75
6,73	38,29	128,81	149,12	130,56	141,52	156,69	24,05	2,60
6,72	38,72	128,72	148,99	130,52	141,48	156,52	24,05	2,70
6,73	38,62	128,42	148,87	130,35	141,27	156,35	24,00	2,50
6,72	38,40	128,35	148,72	130,30	141,15	156,23	23,99	2,64
6,72	38,60	128,28	148,57	130,12	141,04	156,06	23,98	2,72
6,73	38,19	128,10	148,41	130,07	140,82	155,96	23,95	2,73
6,74	37,95	127,85	148,25	129,90	140,75	155,79	23,97	2,72
6,71	38,16	127,68	148,10	129,78	140,59	155,65	23,96	2,57
6,73	38,17	127,50	147,99	129,61	140,46	155,58	23,95	2,49
6,73	38,31	127,28	147,87	129,52	140,34	155,41	23,95	2,29
6,74	38,18	127,15	147,72	129,48	140,25	155,30	24,01	2,37
6,73	37,90	127,01	147,60	129,42	140,07	155,26	24,04	2,57
6,72	37,82	126,79	147,49	129,28	139,92	155,10	24,03	2,39
6,74	38,08	126,83	147,33	129,23	139,78	154,99	23,99	2,69
6,72	37,95	126,70	147,23	129,12	139,67	154,86	23,99	2,67
6,74	37,80	126,55	147,07	129,06	139,49	154,78	24,05	2,62
6,73	37,67	126,61	146,95	128,99	139,37	154,63	24,04	2,60
6,74	37,70	126,37	146,81	128,92	139,28	154,56	24,01	2,76
6,71	37,68	126,33	146,70	128,80	139,14	154,53	24,04	2,62
6,74	37,75	126,12	146,59	128,65	139,00	154,42	24,03	2,49
6,74	37,79	125,97	146,46	128,48	138,91	154,20	23,98	2,49

6,74	37,94	125,87	146,30	128,35	138,81	154,07	23,94	2,36
6,74	37,79	125,75	146,20	128,34	138,65	154,02	23,91	2,72
6,72	37,71	125,60	146,04	128,18	138,51	153,85	23,88	2,52
6,75	37,74	125,46	145,91	128,06	138,37	153,73	23,86	2,45
6,73	37,59	125,23	145,80	127,91	138,25	153,61	23,87	2,56
6,73	37,75	125,23	145,67	127,83	138,15	153,42	23,85	2,44
6,74	37,62	125,12	145,60	127,85	138,04	153,26	23,87	2,39
6,73	37,56	124,97	145,50	127,68	137,88	153,14	23,85	2,56
6,73	37,47	124,78	145,40	127,53	137,75	152,94	23,87	2,35
6,74	37,48	124,66	145,31	127,53	137,59	152,88	23,83	2,44
6,70	37,55	124,57	145,23	127,44	137,43	152,73	23,84	2,55
6,73	37,31	124,37	145,10	127,27	137,33	152,59	23,84	2,47
6,73	37,31	124,30	144,97	127,19	137,16	152,43	23,85	2,43
6,74	37,46	124,14	144,89	127,10	137,10	152,29	23,88	2,39
6,74	37,48	124,10	144,74	127,01	137,00	152,14	23,88	2,42
6,75	37,23	123,89	144,73	126,90	136,77	151,96	23,89	2,51
6,73	37,40	123,77	144,63	126,79	136,73	151,74	23,87	2,55
6,73	37,18	123,67	144,54	126,72	136,67	151,50	23,90	2,32
6,74	36,95	123,54	144,49	126,62	136,45	151,41	23,92	2,23
6,75	36,97	123,36	144,40	126,57	136,37	151,21	23,97	2,32
6,72	37,04	123,23	144,31	126,51	136,18	151,12	23,95	2,48
6,72	36,94	123,07	144,20	126,42	136,01	150,98	23,98	2,32
6,71	36,97	123,10	144,15	126,29	135,93	150,73	23,99	2,42
6,75	36,92	122,85	144,07	126,17	135,74	150,68	23,99	2,35
6,73	36,42	122,77	144,00	126,11	135,62	150,49	23,98	2,30
6,75	36,92	122,56	143,91	126,02	135,49	150,31	23,99	2,29
6,73	36,95	122,21	143,84	125,89	135,41	150,09	24,04	2,46
6,74	36,72	122,16	143,81	125,75	135,27	149,98	24,03	2,53
6,75	37,01	121,97	143,72	125,71	135,16	149,79	24,07	2,30
6,74	36,76	121,92	143,64	125,66	135,02	149,67	24,09	2,35
6,75	36,86	121,59	143,60	125,60	134,93	149,52	24,08	2,58
6,75	36,89	121,50	143,53	125,42	134,86	149,29	24,13	2,41
6,73	36,66	121,33	143,55	125,33	134,77	149,08	24,16	2,39
6,74	36,69	121,20	143,42	125,29	134,56	149,07	24,17	2,30
6,75	36,69	121,02	143,35	125,23	134,50	148,87	24,19	2,37
6,76	36,37	120,90	143,31	125,16	134,33	148,66	24,22	2,32
6,74	36,23	120,68	143,25	125,08	134,20	148,49	24,23	2,37
6,74	36,44	120,55	143,18	125,06	134,09	148,39	24,25	2,18
6,75	36,48	120,42	143,11	125,00	133,97	148,20	24,28	2,31
6,75	36,54	120,37	143,04	124,89	133,88	148,04	24,28	1,98
6,75	36,36	120,15	143,00	124,82	133,76	147,89	24,29	2,32
6,75	36,57	119,96	142,94	124,69	133,71	147,73	24,29	2,22
6,75	35,78	119,92	142,88	124,64	133,60	147,55	24,31	2,23
6,75	36,11	119,69	142,83	124,58	133,44	147,42	24,30	2,16
6,73	36,26	119,69	142,74	124,54	133,33	147,34	24,33	2,01
6,73	36,24	119,57	142,69	124,43	133,27	147,11	24,39	2,00
6,75	36,21	119,59	142,60	124,40	133,09	146,99	24,43	2,20
6,74	36,23	119,32	142,53	124,34	133,02	146,83	24,45	2,10

6,75	36,04	119,23	142,47	124,17	132,90	146,70	24,42	2,15
6,74	36,03	119,17	142,37	124,14	132,79	146,56	24,43	2,14
6,75	36,15	119,04	142,34	124,00	132,69	146,47	24,47	2,26
6,75	35,94	118,79	142,28	123,96	132,56	146,36	24,50	2,09
6,74	36,09	118,73	142,24	123,87	132,49	146,25	24,52	2,06
6,75	36,12	118,55	142,15	123,80	132,42	146,07	24,53	2,13
6,74	36,07	118,56	142,07	123,74	132,25	145,99	24,51	2,39
6,75	36,27	118,43	141,99	123,72	132,14	145,90	24,47	2,07
6,74	36,04	118,43	141,92	123,65	132,03	145,76	24,48	2,30
6,75	36,12	118,17	141,82	123,58	131,97	145,67	24,45	2,13
6,75	35,95	118,13	141,78	123,53	131,84	145,54	24,43	2,06
6,74	35,77	117,93	141,69	123,42	131,69	145,44	24,42	1,96
6,73	35,67	117,91	141,63	123,36	131,61	145,26	24,43	2,14
6,72	35,69	117,90	141,53	123,28	131,44	145,22	24,43	2,14
6,76	35,86	117,80	141,47	123,19	131,36	145,11	24,48	2,09
6,74	35,97	117,72	141,37	123,19	131,27	144,96	24,53	2,00
6,75	35,64	117,49	141,30	123,15	131,18	144,87	24,52	2,02
6,76	35,60	117,44	141,21	123,17	131,06	144,86	24,51	2,45
6,75	35,74	117,33	141,13	123,06	130,97	144,73	24,49	2,29
6,75	35,65	117,37	141,05	123,06	130,84	144,69	24,46	2,02
6,74	35,65	117,15	140,99	122,95	130,72	144,62	24,45	2,03
6,73	35,67	117,03	140,96	122,86	130,64	144,50	24,44	2,27
6,75	35,51	116,88	140,86	122,81	130,52	144,47	24,44	1,97
6,75	35,58	116,91	140,80	122,73	130,47	144,32	24,45	2,11
6,76	35,49	116,79	140,70	122,62	130,36	144,22	24,49	2,30
6,73	35,64	116,72	140,61	122,54	130,25	144,13	24,49	2,03
6,73	35,47	116,64	140,55	122,47	130,17	144,01	24,48	2,08
6,73	35,60	116,53	140,47	122,36	130,11	143,90	24,45	2,10
6,74	35,76	116,54	140,38	122,34	129,99	143,90	24,47	2,03
6,76	35,42	116,47	140,34	122,20	129,89	143,79	24,45	2,09
6,76	35,33	116,39	140,23	122,10	129,79	143,75	24,43	2,10
6,74	35,64	116,19	140,15	121,99	129,74	143,67	24,40	2,01
6,74	35,48	116,07	140,06	121,91	129,62	143,56	24,42	2,04
6,74	35,25	116,08	139,97	121,89	129,47	143,51	24,44	1,94
6,77	35,25	115,94	139,87	121,79	129,37	143,40	24,43	2,16
6,74	35,27	115,83	139,81	121,72	129,30	143,29	24,42	1,93
6,73	35,37	115,87	139,71	121,61	129,17	143,27	24,42	2,04
6,75	35,29	115,83	139,65	121,49	129,19	143,06	24,38	2,03
6,76	35,40	115,63	139,57	121,42	129,06	143,08	24,40	2,03
6,77	35,38	115,65	139,50	121,35	129,06	142,90	24,34	1,97
6,75	35,33	115,38	139,42	121,26	128,97	142,88	24,37	2,06
6,75	35,31	115,45	139,32	121,17	128,92	142,83	24,40	1,97
6,75	35,43	115,33	139,24	121,06	128,86	142,70	24,43	1,89
6,76	35,26	115,40	139,18	121,04	128,76	142,64	24,42	1,80
6,74	35,15	115,32	139,10	120,94	128,69	142,49	24,49	2,16
6,75	34,98	115,33	138,99	120,93	128,59	142,51	24,54	1,87
6,74	35,12	115,20	138,96	120,85	128,54	142,42	24,53	1,86
6,76	35,13	115,20	138,88	120,78	128,45	142,26	24,50	2,01

6,73	35,11	115,12	138,79	120,74	128,35	142,15	24,49	1,95
6,74	35,04	114,98	138,73	120,64	128,35	142,07	24,50	1,84
6,74	35,01	115,01	138,69	120,58	128,29	141,98	24,50	2,02
6,75	35,23	114,86	138,62	120,55	128,23	141,90	24,50	1,91
6,75	35,01	114,75	138,53	120,46	128,24	141,75	24,46	1,95
6,74	34,98	114,65	138,45	120,42	128,07	141,75	24,41	1,94
6,74	35,11	114,71	138,40	120,37	128,06	141,60	24,43	1,99
6,75	35,09	114,66	138,32	120,40	127,96	141,54	24,46	1,81
6,75	34,89	114,46	138,26	120,29	127,92	141,50	24,45	1,88
6,74	34,82	114,62	138,21	120,23	127,89	141,35	24,44	1,92
6,76	34,75	114,44	138,14	120,20	127,80	141,33	24,45	1,88
6,75	34,72	114,42	138,07	120,13	127,74	141,19	24,40	2,13
6,76	34,76	114,40	138,00	120,09	127,63	141,17	24,41	2,00
6,74	34,90	114,43	137,94	120,04	127,65	141,03	24,42	1,89
6,74	34,75	114,33	137,87	119,98	127,52	140,95	24,46	1,99
6,75	35,08	114,11	137,81	119,86	127,51	140,90	24,40	2,01
6,75	34,56	114,10	137,76	119,81	127,47	140,80	24,42	1,83
6,73	34,50	114,12	137,70	119,75	127,39	140,75	24,42	2,16
6,75	34,65	114,00	137,64	119,75	127,29	140,67	24,42	1,99
6,74	34,71	113,93	137,58	119,73	127,25	140,60	24,39	1,96
6,75	34,84	113,89	137,52	119,75	127,17	140,61	24,41	2,05
6,73	34,84	113,78	137,46	119,58	127,19	140,53	24,39	1,81
6,77	34,61	113,85	137,39	119,58	127,08	140,44	24,40	2,01
6,74	34,69	113,90	137,33	119,55	127,06	140,35	24,40	1,98
6,75	34,80	113,77	137,26	119,52	127,07	140,27	24,45	2,15
6,76	35,01	113,63	137,19	119,46	127,02	140,25	24,45	1,90
6,74	34,92	113,67	137,11	119,48	126,90	140,20	24,40	1,82
6,75	34,79	113,65	137,06	119,43	126,88	140,07	24,39	2,23
6,73	34,82	113,59	137,01	119,25	126,92	140,07	24,39	2,09
6,76	34,71	113,61	136,98	119,29	126,81	139,97	24,42	1,91
6,76	35,00	113,41	136,87	119,27	126,78	139,93	24,45	1,81
6,77	34,88	113,34	136,80	119,19	126,80	139,82	24,46	1,95
6,76	35,01	113,14	136,73	119,15	126,79	139,76	24,44	2,06
6,74	34,88	113,08	136,68	119,15	126,69	139,74	24,43	1,96
6,76	34,85	112,96	136,59	119,16	126,67	139,67	24,45	2,00
6,76	34,70	112,91	136,50	119,11	126,60	139,62	24,41	2,14
6,73	34,65	112,87	136,46	119,04	126,55	139,55	24,40	1,86
6,75	34,73	112,80	136,42	119,00	126,43	139,53	24,35	2,02
6,75	34,85	112,78	136,33	118,91	126,46	139,41	24,36	2,07
6,76	34,75	112,68	136,30	118,76	126,41	139,39	24,34	1,88
6,75	34,60	112,56	136,24	118,73	126,32	139,30	24,36	1,85
6,76	34,56	112,55	136,14	118,68	126,28	139,26	24,39	1,88
6,75	34,70	112,31	136,09	118,57	126,24	139,26	24,38	2,08
6,76	34,74	112,22	136,05	118,48	126,22	139,16	24,37	2,05
6,75	34,64	112,14	135,95	118,38	126,17	139,11	24,38	1,95
6,75	34,40	112,12	135,88	118,44	126,07	139,02	24,40	1,86
6,75	34,60	112,05	135,85	118,35	125,99	138,99	24,42	1,88
6,74	34,58	112,05	135,78	118,27	125,94	138,89	24,38	1,77

6,75	34,35	111,99	135,69	118,18	125,89	138,87	24,37	1,98
6,74	34,49	112,00	135,67	118,10	125,81	138,74	24,38	1,97
6,74	34,57	111,95	135,58	118,01	125,80	138,69	24,39	2,12
6,75	34,57	111,76	135,53	117,96	125,71	138,63	24,39	1,97
6,74	34,52	111,76	135,47	117,93	125,69	138,60	24,41	1,94
6,75	34,59	111,58	135,42	117,90	125,59	138,46	24,39	2,13
6,75	34,45	111,57	135,35	117,85	125,52	138,39	24,36	1,79
6,74	34,49	111,43	135,31	117,78	125,47	138,35	24,35	1,86
6,74	34,40	111,36	135,23	117,72	125,39	138,25	24,35	1,79
6,74	34,38	111,34	135,18	117,62	125,31	138,24	24,32	1,76
6,74	34,45	111,18	135,13	117,58	125,25	138,13	24,32	2,14
6,75	34,53	111,24	135,06	117,43	125,17	138,12	24,30	2,01
6,75	34,35	111,24	135,01	117,41	125,11	138,02	24,28	1,88
6,75	34,27	111,20	134,97	117,34	125,11	137,95	24,28	1,87
6,75	34,34	111,00	134,92	117,25	125,04	137,94	24,30	1,91
6,74	34,22	110,86	134,88	117,15	124,99	137,84	24,32	2,11
6,75	34,34	110,75	134,80	117,11	124,90	137,74	24,32	1,93
6,74	34,17	110,74	134,76	117,03	124,82	137,71	24,30	1,96
6,71	34,29	110,69	134,70	116,96	124,77	137,69	24,39	1,99
6,74	34,16	110,64	134,63	116,89	124,75	137,51	24,38	1,76
6,75	34,18	110,70	134,60	116,87	124,70	137,48	24,40	2,10
6,75	34,39	110,60	134,56	116,85	124,65	137,38	24,43	1,77
6,74	34,45	110,47	134,52	116,78	124,55	137,35	24,44	1,96
6,74	34,40	110,36	134,44	116,72	124,49	137,29	24,35	2,11
6,76	34,43	110,35	134,39	116,70	124,39	137,22	24,32	2,00
6,74	34,60	110,19	134,33	116,66	124,30	137,12	24,31	2,03
6,75	34,27	110,21	134,28	116,61	124,22	137,07	24,28	2,07
6,77	34,11	109,94	134,20	116,56	124,14	137,02	24,22	1,91
6,73	34,13	109,86	134,13	116,50	124,06	137,00	24,23	1,89
6,74	34,03	109,91	134,09	116,39	124,03	136,89	24,30	1,87
6,74	34,05	109,87	134,01	116,36	124,00	136,89	24,32	2,13
6,78	34,36	109,87	133,94	116,31	123,96	136,77	24,31	2,08
6,74	34,32	109,94	133,89	116,27	123,90	136,66	24,35	2,06
6,76	34,26	109,83	133,84	116,23	123,81	136,64	24,32	1,98
6,76	34,10	109,83	133,75	116,18	123,74	136,61	24,30	2,00
6,75	34,03	109,75	133,69	116,15	123,70	136,56	24,33	2,03
6,76	34,16	109,49	133,67	116,14	123,62	136,46	24,33	1,89
6,75	34,32	109,44	133,62	116,05	123,58	136,44	24,37	1,80
6,75	34,02	109,37	133,56	116,03	123,57	136,31	24,36	1,89
6,75	34,18	109,22	133,49	115,94	123,48	136,35	24,35	2,18
6,75	34,05	109,08	133,45	115,83	123,44	136,22	24,38	1,97
6,74	34,30	109,12	133,35	115,82	123,35	136,19	24,37	1,94
6,74	34,26	108,97	133,30	115,71	123,26	136,14	24,34	1,89
6,76	34,30	108,98	133,23	115,67	123,21	136,04	24,34	1,94
6,75	34,04	108,86	133,19	115,54	123,11	135,98	24,30	2,02
6,76	34,12	108,88	133,09	115,53	123,06	135,93	24,27	2,02
6,74	34,27	108,85	133,07	115,44	122,98	135,89	24,23	2,08
6,73	33,96	108,76	132,97	115,38	122,94	135,85	24,24	2,02

6,74	33,80	108,68	132,93	115,33	122,89	135,75	24,28	2,01
6,75	33,88	108,57	132,84	115,26	122,80	135,75	24,25	1,81
6,74	34,07	108,47	132,79	115,17	122,75	135,65	24,29	1,80
6,75	33,99	108,39	132,73	115,13	122,69	135,60	24,29	1,75
6,75	34,01	108,25	132,65	115,08	122,59	135,56	24,31	2,11
6,74	34,02	108,24	132,61	115,02	122,57	135,44	24,33	2,17
6,74	34,06	108,04	132,51	114,90	122,44	135,40	24,30	1,93
6,76	34,00	107,91	132,48	114,82	122,33	135,39	24,26	1,81
6,73	33,92	107,94	132,40	114,77	122,24	135,34	24,30	1,95
6,75	33,90	107,82	132,35	114,63	122,20	135,28	24,32	2,02
6,75	33,88	107,80	132,28	114,57	122,08	135,27	24,29	1,83
6,72	33,75	107,74	132,21	114,53	121,98	135,26	24,26	2,04
6,73	33,80	107,74	132,17	114,44	121,96	135,16	24,26	2,08
6,75	33,73	107,73	132,12	114,38	121,88	135,08	24,20	1,92
6,74	33,71	107,75	132,03	114,32	121,77	135,05	24,22	1,97
6,75	33,57	107,58	131,98	114,23	121,74	134,96	24,20	2,09
6,73	33,56	107,60	131,90	114,18	121,59	134,87	24,23	1,98
6,75	33,95	107,45	131,85	114,15	121,52	134,78	24,29	1,87
6,75	33,61	107,37	131,80	114,06	121,47	134,80	24,28	1,88
6,75	33,92	107,30	131,75	113,94	121,38	134,63	24,29	2,02
6,74	33,88	107,21	131,66	113,94	121,29	134,54	24,30	1,86
6,75	33,82	107,23	131,61	113,90	121,22	134,48	24,29	2,03
6,73	33,92	107,14	131,56	113,83	121,13	134,44	24,29	2,06
6,74	34,03	107,11	131,48	113,75	121,03	134,36	24,29	2,13
6,75	33,89	107,13	131,40	113,71	120,95	134,32	24,27	1,96
6,75	33,91	107,13	131,35	113,70	120,85	134,24	24,24	1,72
6,74	33,93	107,06	131,30	113,62	120,81	134,18	24,25	1,99
6,73	33,92	107,04	131,25	113,58	120,70	134,12	24,23	1,70
6,73	33,93	106,78	131,20	113,47	120,60	134,01	24,24	2,03
6,75	33,73	106,84	131,15	113,39	120,45	133,98	24,20	2,15
6,75	33,74	106,81	131,10	113,33	120,35	133,92	24,19	1,92
6,76	33,70	106,83	131,01	113,31	120,35	133,75	24,22	1,89
6,75	33,56	106,69	130,93	113,22	120,22	133,75	24,24	1,96
6,76	33,63	106,62	130,92	113,22	120,12	133,62	24,27	1,83
6,72	33,82	106,41	130,84	113,10	120,07	133,64	24,30	1,77
6,74	33,86	106,45	130,78	113,09	120,02	133,48	24,29	1,93
6,74	33,66	106,31	130,75	113,09	119,95	133,42	24,34	1,95
6,75	33,55	106,26	130,69	113,10	119,87	133,34	24,34	1,86
6,76	33,78	106,15	130,63	112,99	119,76	133,26	24,30	1,92
6,72	33,59	106,21	130,55	112,95	119,64	133,13	24,33	2,03
6,73	33,67	106,04	130,47	112,86	119,58	133,08	24,31	1,88
6,75	33,76	105,82	130,44	112,77	119,45	132,98	24,29	1,85
6,76	33,77	105,89	130,38	112,71	119,35	132,92	24,27	1,93
6,74	33,67	105,64	130,31	112,62	119,25	132,81	24,30	1,72
6,75	33,62	105,55	130,24	112,53	119,20	132,70	24,30	1,69
6,73	33,62	105,61	130,18	112,56	119,04	132,60	24,28	1,86
6,75	33,70	105,49	130,12	112,47	118,98	132,54	24,26	1,77
6,76	33,75	105,45	130,08	112,48	118,89	132,43	24,23	1,84

6,76	33,74	105,23	129,99	112,41	118,80	132,36	24,25	1,84
6,75	33,62	105,29	129,92	112,37	118,72	132,26	24,24	2,00
6,75	33,64	105,24	129,86	112,26	118,67	132,19	24,24	2,02
6,75	33,76	105,22	129,80	112,24	118,56	132,04	24,25	1,92
6,74	33,72	105,05	129,72	112,23	118,50	131,97	24,24	1,94
6,75	33,87	104,96	129,67	112,12	118,37	131,92	24,23	1,94
6,75	33,73	104,91	129,59	111,96	118,31	131,80	24,25	1,89
6,74	33,78	104,91	129,55	111,92	118,22	131,66	24,25	2,04
6,75	33,74	104,74	129,44	111,84	118,07	131,64	24,26	1,88
6,73	33,59	104,84	129,35	111,84	118,01	131,49	24,25	1,74
6,75	33,83	104,67	129,29	111,75	117,90	131,45	24,26	1,81
6,74	33,59	104,55	129,23	111,66	117,82	131,37	24,25	1,80
6,73	33,53	104,38	129,16	111,59	117,74	131,25	24,30	1,89
6,75	33,45	104,36	129,09	111,50	117,64	131,11	24,30	1,95
6,73	33,56	104,27	128,99	111,42	117,56	131,07	24,29	1,73
6,74	33,55	104,23	128,93	111,34	117,40	130,99	24,25	1,75
6,73	33,58	104,04	128,85	111,25	117,36	130,87	24,28	1,82
6,74	33,41	104,14	128,77	111,25	117,28	130,69	24,30	1,86
6,73	33,49	104,07	128,69	111,21	117,12	130,65	24,24	1,99
6,73	33,63	104,04	128,59	111,04	117,15	130,53	24,26	1,78
6,74	33,61	103,95	128,54	111,00	117,07	130,39	24,24	1,96
6,74	33,51	103,84	128,46	110,92	116,92	130,32	24,27	2,02
6,75	33,54	103,91	128,37	110,85	116,89	130,27	24,30	1,89
6,75	33,66	103,78	128,28	110,76	116,80	130,16	24,31	2,02
6,75	33,48	103,74	128,24	110,69	116,75	130,03	24,30	1,87
6,76	33,58	103,77	128,19	110,64	116,64	129,98	24,29	1,79
6,75	33,56	103,66	128,09	110,59	116,57	129,93	24,30	1,84
6,74	33,60	103,64	128,01	110,52	116,50	129,79	24,30	1,68
6,74	33,42	103,55	127,98	110,46	116,42	129,73	24,38	1,87
6,73	33,24	103,49	127,87	110,44	116,35	129,64	24,39	1,84
6,73	33,32	103,42	127,79	110,44	116,22	129,56	24,37	1,85
6,75	33,38	103,17	127,72	110,35	116,15	129,43	24,33	1,92
6,75	33,35	103,11	127,64	110,20	116,09	129,34	24,29	2,01
6,73	33,28	102,97	127,55	110,15	115,94	129,20	24,32	1,79
6,74	33,39	102,98	127,50	110,14	115,88	129,13	24,29	1,82
6,73	33,09	102,93	127,44	110,04	115,77	129,01	24,32	1,84
6,73	33,04	102,85	127,34	109,97	115,67	129,00	24,31	1,73
6,75	33,34	102,73	127,28	109,86	115,60	128,89	24,32	1,99
6,73	33,25	102,74	127,22	109,81	115,47	128,89	24,33	1,79
6,74	33,27	102,62	127,15	109,77	115,40	128,81	24,35	1,98
6,76	33,36	102,71	127,10	109,71	115,37	128,66	24,36	2,01
6,73	33,45	102,44	127,01	109,64	115,32	128,63	24,37	1,87
6,75	33,39	102,42	126,93	109,59	115,16	128,61	24,36	1,97
6,73	33,31	102,34	126,90	109,47	115,08	128,45	24,33	2,05
6,73	33,14	102,30	126,81	109,42	115,08	128,38	24,32	2,08
6,74	33,22	102,24	126,74	109,37	114,95	128,32	24,33	1,85
6,73	33,28	102,20	126,66	109,32	114,80	128,25	24,30	1,85
6,76	33,22	102,16	126,59	109,27	114,77	128,19	24,28	1,89

6,75	33,14	102,18	126,50	109,27	114,67	128,08	24,30	1,98
6,73	33,24	101,99	126,44	109,14	114,65	128,01	24,29	1,88
6,75	33,28	102,04	126,39	109,04	114,55	127,85	24,27	1,82
6,73	33,33	102,10	126,29	108,99	114,49	127,79	24,28	1,74
6,74	33,22	102,01	126,23	108,90	114,43	127,73	24,32	1,94
6,72	33,15	101,90	126,14	108,81	114,35	127,67	24,36	1,84
6,73	33,28	101,76	126,09	108,74	114,34	127,58	24,35	1,82
6,74	33,40	101,77	126,01	108,64	114,25	127,52	24,34	1,88
6,74	33,28	101,76	125,98	108,53	114,14	127,51	24,31	1,92
6,74	33,28	101,68	125,91	108,45	114,08	127,42	24,33	1,83
6,71	33,22	101,61	125,84	108,39	114,00	127,39	24,34	1,90
6,74	33,28	101,57	125,78	108,36	113,90	127,26	24,34	1,99
6,73	33,23	101,54	125,71	108,30	113,84	127,21	24,33	1,77
6,74	33,19	101,52	125,67	108,24	113,79	127,08	24,33	2,00
6,75	33,20	101,50	125,60	108,20	113,73	127,06	24,33	1,73
6,73	33,31	101,40	125,54	108,14	113,70	126,98	24,33	1,71
6,75	33,19	101,30	125,48	108,06	113,60	126,86	24,33	1,56
6,73	33,15	101,14	125,42	107,93	113,55	126,84	24,31	1,75
6,75	33,01	101,06	125,35	107,87	113,41	126,73	24,33	1,93
6,74	33,11	100,99	125,26	107,83	113,34	126,64	24,34	1,93
6,74	33,08	101,01	125,23	107,73	113,27	126,51	24,35	1,68
6,75	32,94	101,03	125,11	107,73	113,18	126,54	24,36	1,74
6,74	33,16	100,94	125,10	107,61	113,10	126,46	24,38	1,88
6,75	33,09	100,90	125,00	107,55	113,08	126,31	24,39	1,91
6,72	33,01	100,77	124,96	107,49	113,01	126,25	24,40	1,82
6,73	33,04	100,78	124,87	107,44	112,92	126,17	24,41	1,94
6,74	32,89	100,66	124,78	107,41	112,90	126,08	24,39	1,79
6,71	33,12	100,64	124,73	107,38	112,85	125,97	24,38	1,76
6,74	33,05	100,56	124,68	107,28	112,76	125,91	24,32	1,97
6,74	33,01	100,50	124,58	107,25	112,73	125,84	24,31	1,92
6,72	33,13	100,41	124,50	107,14	112,63	125,75	24,30	1,88
6,74	33,31	100,35	124,45	107,04	112,54	125,67	24,31	1,80
6,72	33,15	100,33	124,42	106,94	112,53	125,53	24,36	1,92
6,75	33,24	100,23	124,31	106,94	112,49	125,50	24,38	1,78
6,73	33,22	100,26	124,23	106,90	112,42	125,47	24,38	1,80
6,73	33,12	100,25	124,19	106,78	112,40	125,38	24,36	1,77
6,73	33,07	100,27	124,10	106,76	112,38	125,24	24,37	1,82
6,73	32,91	100,26	124,05	106,75	112,29	125,25	24,43	1,82
6,74	32,92	100,16	123,96	106,66	112,20	125,19	24,50	1,85
6,76	32,91	100,22	123,93	106,62	112,21	125,04	24,44	1,86
6,71	32,78	100,14	123,83	106,53	112,20	124,96	24,49	1,94
6,72	32,84	100,08	123,76	106,51	112,20	124,92	24,53	2,00
6,73	32,80	100,01	123,74	106,37	112,14	124,81	24,52	1,82
6,73	32,93	99,96	123,62	106,33	112,12	124,70	24,50	2,05
6,76	32,99	99,87	123,54	106,30	112,06	124,62	24,50	1,95
6,75	33,04	99,92	123,46	106,27	112,05	124,53	24,48	1,83
6,76	32,87	99,91	123,40	106,32	111,96	124,43	24,53	2,05
6,73	33,02	99,65	123,32	106,26	111,99	124,41	24,50	2,01

6,73	33,11	99,70	123,23	106,28	111,87	124,27	24,49	1,88
6,74	33,05	99,69	123,19	106,24	111,88	124,17	24,50	1,94
6,73	32,92	99,72	123,08	106,21	111,89	124,11	24,54	1,82
6,74	32,89	99,63	123,01	106,16	111,86	123,98	24,55	1,76
6,74	33,00	99,67	122,89	106,16	111,79	123,89	24,57	1,66

Pd Kanal - Ps Kanal - | Vægt - [Kg] CO-Lav - [1CO-Høj - [%] CO2 - [%]

	39	40	43	44	45	46
Duct dynamic pressure	Duct static pressure	Platform scale reading	CO low range [100ppm]	CO high range [%]	CO2 - [%]	
24,37	37,25	0,90	6,61	0,06	4,37	
24,51	38,27	4,56	4,72	0,04	1,88	
23,30	37,51	4,28	12,62	0,13	1,69	
23,94	38,38	4,24	22,44	0,32	7,95	
23,41	37,71	4,21	10,99	0,12	10,60	
24,41	37,71	4,19	15,63	0,16	13,55	
24,23	37,58	4,15	22,44	0,35	14,80	
24,17	37,59	4,13	22,44	0,39	14,44	
24,34	37,98	4,11	22,44	0,31	13,93	
23,91	37,72	4,08	22,44	0,25	13,56	
23,69	36,69	4,06	22,44	0,26	13,50	
24,65	38,47	4,04	22,44	0,24	13,58	
23,91	36,50	4,02	22,44	0,30	13,75	
24,15	37,21	4,00	22,44	0,36	13,97	
23,90	37,53	3,98	22,44	0,37	14,15	
23,41	37,30	3,96	22,44	0,28	13,59	
24,18	37,17	3,94	21,47	0,22	13,28	
24,88	37,55	3,92	18,97	0,20	13,10	
24,04	37,37	3,91	17,74	0,18	12,88	
24,33	37,04	3,89	15,86	0,17	12,69	
24,12	38,08	3,87	16,70	0,18	12,54	
24,30	38,28	3,85	18,11	0,19	12,44	
25,14	37,27	3,84	17,20	0,17	12,32	
24,05	36,81	3,82	18,25	0,19	12,21	
24,04	36,98	3,81	17,60	0,18	12,06	
23,54	37,88	3,79	16,78	0,17	12,14	
24,48	37,61	3,77	18,66	0,19	12,15	
24,49	36,98	3,76	17,53	0,19	12,12	
24,70	36,79	3,74	17,10	0,17	12,00	
24,75	37,90	3,72	16,65	0,17	12,08	
24,55	37,76	3,71	17,21	0,17	11,98	
26,10	39,91	3,69	16,93	0,18	11,95	
23,96	37,44	3,68	18,47	0,19	12,01	
23,36	37,26	3,66	19,30	0,19	11,94	
24,76	37,85	3,64	19,18	0,19	11,97	
25,18	38,43	3,63	17,10	0,17	11,94	
24,94	39,36	3,61	16,63	0,18	12,01	
23,72	38,41	3,60	16,80	0,17	12,07	
24,66	38,02	3,58	17,06	0,17	12,07	
24,95	37,69	3,57	16,16	0,16	12,21	
25,82	38,16	3,55	15,55	0,16	12,33	
24,98	38,18	3,54	14,58	0,15	12,25	
29,78	46,41	3,52	14,06	0,14	12,40	

26,23	40,54	3,50	12,24	0,13	12,59
25,85	39,98	3,49	10,18	0,11	12,62
26,47	41,28	3,47	10,68	0,12	12,86
25,86	40,76	3,45	7,56	0,08	13,20
26,04	41,24	3,44	7,36	0,08	13,30
25,55	40,50	3,42	6,82	0,07	13,52
25,33	40,01	3,40	7,97	0,08	13,73
26,70	41,15	3,38	8,24	0,08	13,70
25,98	39,91	3,37	8,06	0,09	13,83
26,50	40,50	3,35	7,84	0,08	14,01
25,89	40,78	3,33	8,27	0,09	14,22
26,07	40,45	3,32	8,32	0,09	14,26
26,14	40,23	3,30	8,33	0,09	14,31
25,84	39,37	3,28	10,18	0,11	14,54
26,10	40,99	3,26	10,81	0,12	14,53
25,65	39,94	3,25	11,44	0,12	14,68
25,50	40,16	3,23	12,71	0,13	14,77
25,49	39,97	3,21	13,66	0,13	14,85
25,05	40,25	3,19	12,89	0,13	14,89
26,32	39,44	3,18	13,16	0,14	15,05
25,86	40,46	3,16	15,92	0,16	15,17
25,40	40,66	3,14	16,38	0,17	15,34
25,91	39,59	3,12	19,10	0,20	15,43
25,05	39,60	3,10	20,61	0,20	15,48
25,66	40,57	3,08	20,98	0,22	15,67
25,27	39,72	3,06	22,44	0,26	15,71
25,78	40,41	3,05	22,44	0,28	15,85
26,26	39,53	3,03	22,44	0,31	15,93
25,69	40,07	3,01	22,44	0,29	15,98
26,62	40,46	2,99	22,44	0,31	16,10
26,48	40,05	2,97	22,44	0,34	16,28
26,54	40,59	2,95	22,44	0,35	16,42
27,20	40,83	2,93	22,44	0,32	16,42
26,15	40,73	2,91	22,44	0,36	16,61
25,52	39,89	2,90	22,44	0,39	16,69
25,40	39,98	2,88	22,44	0,38	16,68
25,90	40,61	2,86	22,44	0,40	16,59
25,65	40,01	2,84	22,44	0,46	16,60
25,60	40,03	2,82	22,44	0,46	16,73
26,65	40,54	2,80	22,44	0,50	16,84
26,40	39,58	2,78	22,44	0,51	16,85
25,86	39,44	2,76	22,44	0,52	16,86
26,05	39,54	2,74	22,44	0,55	16,88
25,31	39,87	2,72	22,44	0,55	16,93
25,02	39,56	2,70	22,44	0,60	17,10
26,66	40,15	2,68	22,44	0,60	17,11
25,50	39,64	2,67	22,44	0,64	17,07
26,15	40,51	2,65	22,44	0,66	17,02

25,74	39,61	2,63	22,44	0,65	17,08
26,49	41,28	2,61	22,44	0,67	17,10
25,89	39,53	2,59	22,44	0,68	17,12
25,76	39,83	2,57	22,44	0,69	17,12
26,03	39,59	2,55	22,44	0,68	17,06
26,10	39,42	2,53	22,44	0,72	17,19
25,50	39,76	2,51	22,44	0,68	17,09
25,23	39,73	2,49	22,44	0,67	17,12
25,41	39,27	2,48	22,44	0,64	17,26
25,90	39,76	2,46	22,44	0,66	17,18
26,10	39,98	2,44	22,44	0,62	17,19
26,12	40,24	2,42	22,44	0,63	17,18
25,07	39,66	2,40	22,44	0,63	17,26
26,30	40,29	2,38	22,44	0,60	17,24
25,90	39,56	2,37	22,44	0,63	17,21
26,18	40,05	2,35	22,44	0,61	17,08
25,55	39,69	2,33	22,44	0,69	17,21
26,52	39,76	2,31	22,44	0,62	17,22
27,86	40,81	2,29	22,44	0,67	17,19
26,04	40,16	2,28	22,44	0,69	17,20
25,95	40,06	2,26	22,44	0,74	17,18
25,24	39,68	2,24	22,44	0,74	17,15
25,54	39,46	2,22	22,44	0,77	17,20
25,80	39,20	2,20	22,44	0,77	17,30
26,00	39,83	2,18	22,44	0,74	17,38
26,02	38,80	2,17	22,44	0,73	17,35
26,42	39,71	2,15	22,44	0,73	17,37
27,52	43,84	2,13	22,44	0,82	17,40
26,13	40,08	2,11	22,44	0,92	17,40
25,86	39,28	2,09	22,44	1,00	17,39
25,65	39,93	2,07	22,44	1,04	17,44
25,76	40,13	2,06	22,44	1,00	17,28
25,48	39,46	2,04	22,44	1,11	17,45
25,88	39,81	2,02	22,44	1,21	17,35
25,51	39,66	2,00	22,44	1,29	17,45
26,19	40,92	1,99	22,44	1,22	17,44
26,10	39,09	1,96	22,44	1,20	17,32
26,58	40,46	1,95	22,44	1,12	17,42
25,85	39,37	1,93	22,44	1,11	17,20
25,56	39,43	1,91	22,44	0,97	17,10
26,34	40,01	1,90	22,44	0,74	16,71
25,88	39,04	1,89	22,44	0,44	16,06
26,18	39,80	1,87	22,44	0,25	15,64
25,57	39,09	1,86	11,04	0,13	15,27
27,17	41,27	1,85	8,76	0,10	15,07
25,53	40,31	1,83	7,53	0,09	15,04
26,08	39,77	1,82	8,45	0,10	15,15
25,20	39,46	1,80	11,27	0,12	15,30

25,44	39,93	1,79	10,32	0,10	15,33
26,04	39,78	1,78	12,41	0,13	15,35
25,81	39,82	1,77	12,02	0,12	15,28
26,41	39,64	1,75	14,74	0,16	15,13
24,12	39,63	1,74	14,06	0,15	15,29
26,28	39,17	1,73	12,49	0,14	15,21
26,32	39,73	1,71	12,65	0,13	15,32
25,54	39,96	1,70	12,05	0,12	15,03
26,22	39,96	1,69	13,48	0,14	15,00
26,17	39,55	1,68	12,44	0,12	14,83
25,81	40,26	1,67	9,68	0,11	14,65
26,31	40,17	1,66	8,86	0,09	14,53
24,95	39,47	1,64	9,81	0,11	14,43
23,86	36,90	1,63	8,30	0,09	14,30
24,04	35,94	1,62	5,70	0,06	14,07
23,70	35,83	1,61	4,58	0,06	14,03
23,39	35,63	1,60	4,39	0,05	13,83
23,87	37,01	1,59	3,29	0,03	13,64
23,40	35,87	1,58	3,11	0,03	13,38
23,04	35,87	1,58	2,95	0,04	13,05
23,81	36,55	1,57	2,34	0,04	12,84
23,53	36,73	1,56	2,76	0,04	12,67
23,19	35,95	1,55	2,80	0,03	12,72
23,45	36,22	1,54	2,90	0,02	12,64
23,29	36,14	1,53	2,83	0,02	12,61
23,40	35,70	1,52	3,97	0,05	12,60
23,69	35,26	1,52	4,00	0,05	12,53
23,21	35,81	1,51	4,37	0,05	12,49
23,77	37,19	1,50	4,88	0,06	12,52
23,01	36,19	1,49	5,13	0,06	12,49
23,25	36,23	1,48	4,80	0,05	12,47
22,94	35,88	1,48	5,23	0,06	12,56
22,68	35,87	1,47	4,96	0,06	12,49
23,67	35,90	1,46	4,90	0,05	12,38
22,72	35,88	1,45	5,83	0,06	12,37
24,30	37,21	1,45	4,98	0,04	12,30
24,12	36,65	1,44	6,02	0,06	12,21
23,04	36,23	1,43	6,66	0,07	12,29
23,51	35,96	1,42	6,41	0,07	12,08
23,20	36,27	1,42	7,65	0,08	12,12
23,04	35,98	1,41	5,41	0,06	12,27
23,37	36,23	1,40	5,92	0,06	12,31
23,18	36,31	1,40	6,55	0,06	12,33
22,41	36,03	1,39	4,75	0,05	12,32
23,09	35,92	1,38	4,79	0,05	12,39
23,60	36,46	1,38	4,74	0,05	12,46
22,51	35,47	1,37	4,20	0,05	12,57
23,38	35,98	1,36	4,12	0,06	12,75

23,89	36,61	1,35	3,88	0,04	12,80
23,55	37,88	1,34	3,67	0,04	12,94
25,83	40,00	1,34	3,54	0,04	12,68
25,59	39,09	1,33	4,99	0,06	12,14
25,66	39,54	1,33	6,88	0,08	11,77
25,92	39,70	1,33	8,40	0,09	11,35
25,91	39,78	1,32	10,94	0,12	10,98
25,99	39,75	1,32	12,52	0,12	10,94
25,55	40,24	1,32	12,53	0,12	10,86
26,32	39,75	1,32	13,83	0,14	10,85
26,51	40,64	1,31	16,35	0,17	10,52
25,93	39,02	1,31	19,14	0,19	10,34
26,30	40,18	1,31	22,44	0,26	9,84
25,90	39,68	1,31	22,44	0,30	9,35
25,85	39,73	1,31	22,44	0,38	8,79
25,94	39,64	1,31	22,44	0,43	8,30
25,97	39,54	1,31	22,44	0,47	8,06
26,86	40,80	1,31	22,44	0,52	7,91
24,92	39,75	1,31	22,44	0,59	7,70
26,43	39,02	1,31	22,44	0,63	7,65
25,88	39,69	1,31	22,44	0,69	7,47
25,44	40,38	1,31	22,44	0,70	7,38
25,31	39,80	1,30	22,44	0,71	7,27
26,13	39,89	1,30	22,44	0,73	7,26
26,23	39,02	1,30	22,44	0,73	7,33
26,33	40,34	1,30	22,44	0,75	7,36
25,80	39,29	1,29	22,44	0,73	7,38
26,07	40,10	1,29	22,44	0,75	7,41
25,62	39,25	1,29	22,44	0,75	7,40
25,92	39,40	1,29	22,44	0,73	7,36
26,04	40,08	1,29	22,44	0,73	7,43
25,80	39,26	1,28	22,44	0,72	7,41
25,27	40,09	1,28	22,44	0,72	7,42
25,52	40,03	1,28	22,44	0,72	7,40
25,79	40,85	1,28	22,44	0,72	7,40
24,84	40,07	1,28	22,44	0,72	7,43
25,85	39,80	1,28	22,44	0,71	7,42
26,15	40,42	1,27	22,44	0,72	7,41
26,41	39,52	1,27	22,44	0,72	7,44
26,83	39,83	1,27	22,44	0,72	7,43
26,43	39,63	1,27	22,44	0,72	7,43
25,77	40,10	1,27	22,44	0,72	7,41
26,27	39,31	1,27	22,44	0,71	7,45
26,43	39,72	1,27	22,44	0,72	7,46
25,70	40,04	1,26	22,44	0,71	7,42
26,47	39,47	1,26	22,44	0,72	7,45
25,59	39,26	1,26	22,44	0,71	7,46
26,79	40,85	1,26	22,44	0,71	7,43

26,02	41,18	1,26	22,44	0,71	7,46
25,49	39,70	1,26	22,44	0,71	7,47
25,26	39,18	1,25	22,44	0,71	7,40
25,70	39,61	1,25	22,44	0,71	7,44
25,99	40,76	1,25	22,44	0,72	7,46
25,52	39,75	1,25	22,44	0,72	7,48
26,03	39,41	1,25	22,44	0,71	7,49
26,34	41,11	1,24	22,44	0,72	7,53
25,76	39,25	1,24	22,44	0,72	7,54
25,66	39,30	1,24	22,44	0,70	7,51
25,46	40,45	1,24	22,44	0,70	7,46
25,11	38,30	1,24	22,44	0,71	7,50
25,17	40,00	1,24	22,44	0,73	7,49
25,55	39,71	1,24	22,44	0,72	7,54
24,90	39,70	1,23	22,44	0,73	7,57
26,03	39,63	1,23	22,44	0,71	7,61
25,99	39,29	1,23	22,44	0,71	7,58
24,65	40,02	1,23	22,44	0,71	7,63
25,90	39,93	1,23	22,44	0,70	7,60
25,21	39,59	1,23	22,44	0,70	7,61
25,26	39,73	1,23	22,44	0,71	7,62
25,67	39,49	1,23	22,44	0,70	7,65
25,74	38,20	1,22	22,44	0,70	7,62
25,13	38,50	1,22	22,44	0,70	7,58
24,49	38,58	1,22	22,44	0,70	7,59
24,68	37,69	1,22	22,44	0,69	7,56
24,48	38,16	1,22	22,44	0,69	7,56
24,24	39,34	1,22	22,44	0,70	7,48
24,65	38,14	1,22	22,44	0,69	7,51
25,09	38,55	1,21	22,44	0,69	7,50
25,98	38,70	1,21	22,44	0,69	7,57
25,13	38,54	1,21	22,44	0,68	7,50
24,95	38,39	1,21	22,44	0,69	7,53
24,21	38,63	1,21	22,44	0,68	7,52
25,30	39,51	1,21	22,44	0,68	7,53
24,85	38,59	1,21	22,44	0,67	7,57
24,30	38,73	1,21	22,44	0,68	7,57
24,48	38,31	1,20	22,44	0,68	7,55
25,23	38,57	1,20	22,44	0,67	7,55
25,71	38,64	1,20	22,44	0,67	7,55
24,59	39,47	1,20	22,44	0,67	7,55
25,15	38,58	1,20	22,44	0,67	7,59
24,78	38,58	1,20	22,44	0,67	7,56
26,12	38,41	1,20	22,44	0,67	7,57
25,42	38,72	1,19	22,44	0,66	7,51
25,63	38,73	1,19	22,44	0,67	7,59
25,38	38,84	1,19	22,44	0,66	7,55
25,43	39,35	1,19	22,44	0,66	7,54

25,34	38,61	1,19	22,44	0,67	7,56
25,86	40,10	1,17	22,44	0,66	7,63
25,11	39,23	1,17	22,44	0,66	7,59
25,37	39,22	1,17	22,44	0,66	7,56
24,92	38,61	1,17	22,44	0,66	7,60
25,04	39,38	1,17	22,44	0,66	7,59
24,57	38,47	1,17	22,44	0,66	7,59
25,68	39,11	1,17	22,44	0,66	7,61
24,55	38,69	1,17	22,44	0,65	7,58
25,59	38,94	1,16	22,44	0,65	7,58
25,89	39,02	1,16	22,44	0,66	7,58
26,08	39,58	1,16	22,44	0,65	7,58
25,31	39,25	1,16	22,44	0,65	7,53
24,37	38,64	1,16	22,44	0,66	7,59
24,58	38,13	1,16	22,44	0,65	7,61
24,95	38,74	1,16	22,44	0,66	7,62
25,50	38,85	1,16	22,44	0,65	7,60
25,52	39,06	1,15	22,44	0,67	7,60
26,03	38,85	1,15	22,44	0,67	7,65
25,67	40,43	1,15	22,44	0,67	7,66
26,03	40,90	1,15	22,44	0,66	7,63
25,54	39,54	1,15	22,44	0,67	7,62
25,39	39,63	1,15	22,44	0,67	7,63
25,42	40,00	1,15	22,44	0,66	7,61
25,19	39,24	1,15	22,44	0,67	7,61
25,56	39,26	1,14	22,44	0,66	7,63
25,61	39,38	1,14	22,44	0,67	7,66
25,02	38,51	1,14	22,44	0,67	7,62
25,45	38,73	1,14	22,44	0,67	7,66
25,51	38,92	1,14	22,44	0,67	7,66
25,23	38,79	1,14	22,44	0,67	7,66
25,08	39,88	1,14	22,44	0,67	7,68
25,24	39,04	1,14	22,44	0,68	7,70
25,97	39,46	1,13	22,44	0,68	7,71
25,11	39,31	1,13	22,44	0,68	7,71
25,25	39,67	1,13	22,44	0,68	7,74
25,13	39,85	1,13	22,44	0,67	7,70
25,44	39,23	1,13	22,44	0,67	7,70
25,94	38,89	1,13	22,44	0,67	7,72
24,70	39,69	1,13	22,44	0,68	7,75
25,07	38,65	1,13	22,44	0,68	7,73
25,48	38,59	1,12	22,44	0,68	7,76
25,73	39,44	1,12	22,44	0,68	7,74
24,95	39,36	1,12	22,44	0,68	7,75
25,12	39,40	1,12	22,44	0,66	7,68
24,36	38,58	1,12	22,44	0,68	7,77
27,10	39,93	1,12	22,44	0,69	7,76
25,35	39,58	1,12	22,44	0,70	7,78

25,21	39,42	1,12	22,44	0,69	7,78
24,58	39,78	1,11	22,44	0,68	7,78
25,46	38,16	1,11	22,44	0,70	7,82
24,51	39,22	1,11	22,44	0,69	7,81
25,34	39,13	1,11	22,44	0,70	7,83
25,62	38,55	1,11	22,44	0,70	7,81
25,67	39,05	1,11	22,44	0,70	7,84
25,06	39,49	1,11	22,44	0,68	7,78
25,30	39,47	1,11	22,44	0,70	7,81
25,28	38,81	1,10	22,44	0,69	7,81
24,67	39,10	1,10	22,44	0,70	7,85
25,79	39,23	1,10	22,44	0,71	7,87
25,30	38,61	1,10	22,44	0,71	7,88
25,75	38,91	1,10	22,44	0,71	7,84
24,34	38,89	1,10	22,44	0,71	7,90
24,22	38,37	1,10	22,44	0,71	7,88
25,24	39,20	1,10	22,44	0,71	7,89
25,54	39,56	1,09	22,44	0,71	7,90
25,62	38,77	1,09	22,44	0,71	7,90
26,16	39,20	1,09	22,44	0,70	7,86
26,08	39,29	1,09	22,44	0,72	7,90
25,53	39,15	1,09	22,44	0,71	7,88
24,29	38,53	1,09	22,44	0,70	7,90
26,45	39,53	1,09	22,44	0,72	7,90
25,57	39,05	1,09	22,44	0,71	7,91
24,98	38,00	1,08	22,44	0,71	7,90
24,89	39,29	1,08	22,44	0,71	7,93
24,41	38,59	1,08	22,44	0,72	7,92
24,61	38,55	1,08	22,44	0,72	7,99
26,30	38,64	1,08	22,44	0,72	7,96
25,28	39,26	1,08	22,44	0,72	7,96
25,07	39,22	1,08	22,44	0,72	8,00
25,77	39,07	1,08	22,44	0,72	7,96
25,54	39,51	1,07	22,44	0,72	7,96
24,96	39,61	1,07	22,44	0,71	7,96
25,21	39,65	1,07	22,44	0,72	7,97
26,02	39,25	1,07	22,44	0,72	7,93
25,67	38,74	1,07	22,44	0,71	7,89
26,16	38,97	1,07	22,44	0,72	7,95
25,02	38,70	1,07	22,44	0,72	7,92
25,61	40,13	1,07	22,44	0,72	7,96
25,44	38,93	1,07	22,44	0,72	7,98
24,83	38,09	1,06	22,44	0,71	7,95
25,44	39,27	1,06	22,44	0,72	7,97
25,28	39,30	1,06	22,44	0,72	7,99
24,98	39,14	1,06	22,44	0,72	7,99
25,78	39,19	1,06	22,44	0,72	7,89
25,12	39,07	1,06	22,44	0,71	7,86

25,61	39,00	1,06	22,44	0,71	7,84
25,47	40,00	1,06	22,44	0,71	7,85
25,10	38,84	1,05	22,44	0,71	7,82
25,56	39,37	1,05	22,44	0,72	7,85
25,85	39,54	1,05	22,44	0,72	7,82
24,61	39,01	1,05	22,44	0,73	7,86
25,22	38,87	1,05	22,44	0,71	7,84
26,34	38,51	1,05	22,44	0,71	7,83
25,29	38,88	1,05	22,44	0,73	7,87
25,40	39,60	1,05	22,44	0,73	7,93
24,72	39,32	1,04	22,44	0,73	7,91
23,74	38,25	1,04	22,44	0,73	7,93
25,28	38,87	1,04	22,44	0,74	7,90
25,92	39,52	1,04	22,44	0,74	7,90
26,39	40,01	1,04	22,44	0,75	7,92
25,15	38,71	1,04	22,44	0,73	7,92
24,98	38,58	1,04	22,44	0,73	7,86
25,45	39,94	1,04	22,44	0,73	7,85
25,30	39,13	1,03	22,44	0,73	7,90
25,34	38,72	1,03	22,44	0,73	7,92
24,88	39,00	1,03	22,44	0,73	7,92
24,95	39,11	1,03	22,44	0,73	7,91
25,64	39,51	1,03	22,44	0,74	7,93
24,62	38,37	1,03	22,44	0,73	7,90
26,10	38,91	1,03	22,44	0,75	7,94
25,06	39,21	1,03	22,44	0,75	8,03
26,02	39,32	1,02	22,44	0,74	8,04
25,41	38,41	1,02	22,44	0,76	8,03
25,85	39,14	1,02	22,44	0,75	8,02
25,10	40,38	1,02	22,44	0,74	7,99
24,41	38,66	1,02	22,44	0,74	7,98
24,31	38,17	1,02	22,44	0,75	8,03
25,65	39,20	1,02	22,44	0,75	8,04
25,96	40,26	1,02	22,44	0,75	8,04
26,25	39,14	1,02	22,44	0,75	8,02
25,44	39,06	1,02	22,44	0,74	8,00
24,93	39,59	1,01	22,44	0,75	8,03
26,45	39,70	1,01	22,44	0,75	8,03
25,73	39,79	1,01	22,44	0,74	8,06
25,29	38,77	1,01	22,44	0,75	8,08
25,00	39,14	1,01	22,44	0,75	8,05
25,74	39,14	1,01	22,44	0,74	8,01
24,20	39,06	1,01	22,44	0,75	8,09
25,71	38,81	1,00	22,44	0,74	7,98
26,17	38,29	1,00	22,44	0,76	7,88
24,80	37,70	1,00	22,44	0,75	7,82
25,48	39,36	1,00	22,44	0,76	7,81
26,37	39,31	1,00	22,44	0,76	7,82

25,52	38,70	1,00	22,44	0,76	7,81
25,33	38,66	1,00	22,44	0,76	7,80
26,23	39,88	1,00	22,44	0,75	7,78
26,14	39,84	1,00	22,44	0,75	7,79
25,71	39,68	0,99	22,44	0,75	7,77
24,96	39,34	0,99	22,44	0,75	7,80
25,17	39,43	0,99	22,44	0,76	7,79
25,00	38,33	0,99	22,44	0,76	7,81
25,75	38,62	0,99	22,44	0,75	7,83
24,89	38,51	0,99	22,44	0,75	7,82
24,36	38,00	0,99	22,44	0,75	7,82
25,35	39,08	0,99	22,44	0,76	7,87
25,30	38,56	0,99	22,44	0,75	7,86
25,35	39,39	0,98	22,44	0,76	7,84
24,59	39,17	0,98	22,44	0,76	7,82
24,89	39,78	0,98	22,44	0,76	7,85
25,64	38,84	0,98	22,44	0,75	7,85
25,69	38,13	0,98	22,44	0,75	7,84
25,84	39,65	0,98	22,44	0,76	7,85
25,20	39,43	0,98	22,44	0,75	7,85
25,62	38,45	0,98	22,44	0,76	7,87
24,31	38,54	0,97	22,44	0,76	7,89
24,90	39,36	0,97	22,44	0,76	7,88
25,36	39,39	0,97	22,44	0,76	7,90
26,05	39,41	0,97	22,44	0,75	7,90
25,23	39,00	0,97	22,44	0,75	7,85
25,63	38,68	0,97	22,44	0,75	7,82
26,59	39,22	0,97	22,44	0,75	7,84
25,53	38,75	0,97	22,44	0,75	7,81
24,57	38,20	0,97	22,44	0,74	7,80
26,86	39,81	0,97	22,44	0,75	7,83
24,27	39,02	0,96	22,44	0,74	7,82
25,46	38,88	0,96	22,44	0,75	7,90
26,11	39,09	0,96	22,44	0,74	7,88
25,43	39,68	0,96	22,44	0,74	7,87
25,63	40,18	0,96	22,44	0,75	7,89
24,81	39,16	0,96	22,44	0,75	7,91
24,66	38,97	0,96	22,44	0,75	7,87
25,67	39,36	0,95	22,44	0,74	7,88
24,68	38,61	0,95	22,44	0,74	7,86
25,11	39,07	0,95	22,44	0,73	7,85
24,59	39,08	0,95	22,44	0,74	7,84
25,36	38,60	0,95	22,44	0,75	7,90
25,39	39,69	0,95	22,44	0,75	7,96
25,08	38,79	0,95	22,44	0,75	7,92
25,22	39,40	0,95	22,44	0,75	7,92
26,20	39,27	0,95	22,44	0,74	7,92
25,95	39,26	0,95	22,44	0,75	7,92

24,62	39,09	0,94	22,44	0,74	7,91
25,34	38,58	0,94	22,44	0,74	7,88
24,59	39,09	0,94	22,44	0,74	7,87
25,04	38,50	0,94	22,44	0,74	7,88
26,08	40,64	0,94	22,44	0,74	7,90
25,63	39,31	0,94	22,44	0,75	7,91
26,34	39,31	0,94	22,44	0,74	7,88
26,43	39,54	0,94	22,44	0,74	7,91
25,31	38,79	0,94	22,44	0,75	7,89
25,85	38,35	0,93	22,44	0,74	7,91
26,23	38,57	0,93	22,44	0,74	7,93
25,27	38,71	0,93	22,44	0,74	7,91
25,18	38,97	0,93	22,44	0,74	7,93
25,64	39,13	0,93	22,44	0,75	7,91
26,37	39,60	0,93	22,44	0,75	7,95
24,51	39,44	0,93	22,44	0,75	7,97
26,27	39,39	0,93	22,44	0,75	7,96
24,76	38,93	0,93	22,44	0,74	7,97
25,51	39,55	0,92	22,44	0,74	7,96
25,35	38,97	0,92	22,44	0,74	7,96
24,41	39,90	0,92	22,44	0,74	7,95
25,51	38,82	0,92	22,44	0,74	7,96
24,14	38,09	0,92	22,44	0,74	7,97
25,19	38,29	0,92	22,44	0,74	7,95
24,96	38,69	0,92	22,44	0,74	7,97
25,24	38,68	0,92	22,44	0,74	7,99
24,92	39,03	0,92	22,44	0,75	8,02
24,57	39,12	0,91	22,44	0,75	8,01
24,59	38,30	0,91	22,44	0,74	8,01
24,46	39,66	0,91	22,44	0,74	7,99
25,19	39,26	0,91	22,44	0,74	7,98
25,70	38,40	0,91	22,44	0,74	7,97
25,01	38,31	0,91	22,44	0,75	8,00
25,11	38,33	0,91	22,44	0,76	8,03
24,61	38,30	0,91	22,44	0,76	8,03
25,90	39,12	0,91	22,44	0,78	8,12
25,42	38,71	0,91	22,44	0,79	8,15
25,44	38,16	0,90	22,44	0,80	8,18
25,65	39,10	0,90	22,44	0,79	8,17
24,82	38,62	0,90	22,44	0,78	8,17
25,00	38,95	0,90	22,44	0,78	8,15
24,99	38,43	0,90	22,44	0,78	8,13
24,97	39,26	0,90	22,44	0,78	8,13
25,16	39,08	0,90	22,44	0,77	8,16
24,89	38,06	0,90	22,44	0,77	8,19
24,99	38,95	0,90	22,44	0,78	8,23
24,07	38,77	0,90	22,44	0,77	8,22
25,27	38,53	0,89	22,44	0,77	8,25

25,43	38,64	0,89	22,44	0,77	8,24
25,28	38,04	0,89	22,44	0,78	8,29
24,19	38,55	0,89	22,44	0,77	8,24
25,22	37,83	0,89	22,44	0,76	8,25
24,52	38,42	0,89	22,44	0,76	8,24
25,09	38,82	0,89	22,44	0,76	8,24
24,34	38,72	0,88	22,44	0,77	8,21
25,76	38,55	0,88	22,44	0,76	8,22
24,43	38,58	0,88	22,44	0,75	8,22
24,63	38,26	0,88	22,44	0,75	8,25
24,91	38,24	0,88	22,44	0,76	8,27
24,83	38,31	0,88	22,44	0,76	8,25
24,67	39,58	0,88	22,44	0,77	8,23
25,24	38,28	0,88	22,44	0,79	8,27
25,29	38,47	0,88	22,44	0,80	8,29
26,19	38,80	0,88	22,44	0,81	8,29
25,44	38,40	0,87	22,44	0,81	8,27
24,97	38,60	0,87	22,44	0,79	8,25
25,44	38,88	0,87	22,44	0,80	8,26
24,88	38,41	0,87	22,44	0,79	8,26
25,33	38,13	0,87	22,44	0,79	8,27
24,98	38,86	0,87	22,44	0,79	8,25
25,31	38,25	0,87	22,44	0,79	8,24
25,15	39,09	0,87	22,44	0,79	8,25
25,19	38,92	0,87	22,44	0,80	8,21
25,35	38,38	0,87	22,44	0,81	8,04
24,87	37,68	0,86	22,44	0,81	7,92
25,15	38,57	0,86	22,44	0,81	7,84
25,09	38,07	0,86	22,44	0,81	7,83
23,84	37,68	0,86	22,44	0,81	7,82
24,44	38,23	0,86	22,44	0,81	7,85
24,25	39,02	0,86	22,44	0,81	7,85
25,51	39,33	0,86	22,44	0,80	7,82
25,24	38,55	0,86	22,44	0,79	7,81
25,71	39,22	0,86	22,44	0,80	7,80
25,53	38,64	0,85	22,44	0,79	7,81
24,05	38,45	0,85	22,44	0,78	7,76
24,20	38,45	0,85	22,44	0,78	7,74
24,51	38,91	0,85	22,44	0,78	7,78
25,53	38,53	0,85	22,44	0,78	7,78
26,24	38,92	0,85	22,44	0,78	7,79
24,94	38,21	0,85	22,44	0,78	7,78
25,94	38,89	0,85	22,44	0,77	7,79
24,86	38,99	0,85	22,44	0,77	7,80
25,93	38,85	0,84	22,44	0,78	7,78
26,46	40,69	0,84	22,44	0,77	7,79
25,89	39,21	0,84	22,44	0,77	7,82
25,38	38,99	0,84	22,44	0,77	7,80

24,39	38,18	0,84	22,44	0,77	7,75
24,85	38,71	0,84	22,44	0,77	7,76
25,20	38,93	0,84	22,44	0,76	7,77
25,16	38,70	0,84	22,44	0,76	7,76
25,47	38,24	0,84	22,44	0,76	7,78
24,03	37,62	0,84	22,44	0,76	7,79
25,02	38,63	0,83	22,44	0,76	7,77
24,73	37,66	0,83	22,44	0,75	7,76
24,53	38,42	0,83	22,44	0,76	7,73
25,07	38,29	0,83	22,44	0,76	7,76
25,70	38,02	0,83	22,44	0,76	7,76
25,02	38,68	0,83	22,44	0,76	7,77
25,46	38,67	0,83	22,44	0,75	7,75
25,20	38,62	0,83	22,44	0,75	7,75
24,87	38,66	0,83	22,44	0,76	7,77
25,52	38,51	0,83	22,44	0,76	7,77
25,30	38,78	0,82	22,44	0,76	7,75
25,53	38,24	0,82	22,44	0,75	7,76
24,53	38,47	0,82	22,44	0,76	7,70
24,84	38,75	0,82	22,44	0,76	7,67
25,07	39,07	0,82	22,44	0,75	7,64
24,16	37,72	0,82	22,44	0,77	7,63
25,69	38,42	0,82	22,44	0,77	7,62
25,79	38,60	0,82	22,44	0,76	7,57
25,83	38,48	0,82	22,44	0,76	7,58
24,95	38,16	0,82	22,44	0,76	7,56
24,95	38,11	0,81	22,44	0,76	7,57
24,93	37,78	0,81	22,44	0,75	7,52
25,29	38,78	0,81	22,44	0,75	7,49
25,52	38,54	0,81	22,44	0,75	7,51
25,26	39,29	0,81	22,44	0,76	7,54
25,05	38,45	0,81	22,44	0,76	7,56
25,54	38,81	0,81	22,44	0,76	7,55
24,48	38,19	0,81	22,44	0,76	7,56
24,59	38,00	0,81	22,44	0,76	7,54
25,09	38,81	0,81	22,44	0,76	7,54
24,58	39,33	0,80	22,44	0,75	7,51
23,93	37,04	0,80	22,44	0,75	7,53
25,89	39,44	0,80	22,44	0,74	7,52
25,40	38,43	0,80	22,44	0,74	7,48
25,44	38,98	0,80	22,44	0,74	7,44
25,07	38,20	0,80	22,44	0,74	7,43
25,13	39,48	0,80	22,44	0,73	7,40
25,18	38,38	0,80	22,44	0,74	7,42
24,57	39,67	0,80	22,44	0,73	7,39
24,50	39,30	0,80	22,44	0,72	7,41
24,99	38,92	0,79	22,44	0,72	7,40
25,67	38,89	0,79	22,44	0,73	7,41

25,63	38,74	0,79	22,44	0,72	7,39
24,11	38,74	0,79	22,44	0,73	7,41
25,44	38,63	0,79	22,44	0,73	7,35
25,84	39,15	0,79	22,44	0,73	7,27
24,74	38,65	0,79	22,44	0,73	7,28
24,78	38,05	0,79	22,44	0,74	7,29
24,64	38,35	0,79	22,44	0,73	7,24
25,18	39,02	0,79	22,44	0,73	7,24
25,21	37,86	0,78	22,44	0,72	7,19
25,63	38,25	0,78	22,44	0,73	7,22
24,08	38,17	0,78	22,44	0,72	7,18
23,73	38,32	0,78	22,44	0,72	7,19
24,33	38,39	0,78	22,44	0,72	7,16
24,18	38,40	0,78	22,44	0,72	7,17
26,31	37,95	0,78	22,44	0,71	7,17
25,73	38,12	0,78	22,44	0,71	7,17
25,09	39,00	0,78	22,44	0,71	7,17
24,36	38,30	0,78	22,44	0,71	7,18
24,45	39,24	0,78	22,44	0,71	7,17
25,68	38,82	0,77	22,44	0,71	7,16
25,78	38,66	0,77	22,44	0,71	7,17
24,43	39,05	0,77	22,44	0,70	7,16
25,55	39,02	0,77	22,44	0,70	7,17
25,87	37,87	0,77	22,44	0,70	7,16
23,61	38,57	0,77	22,44	0,70	7,14
25,11	38,79	0,77	22,44	0,70	7,12
24,21	38,30	0,77	22,44	0,70	7,10
23,88	37,92	0,77	22,44	0,69	7,10
25,60	38,49	0,77	22,44	0,69	7,12
25,42	38,98	0,76	22,44	0,69	7,07
24,77	38,58	0,76	22,44	0,68	7,06
25,27	38,23	0,76	22,44	0,68	7,03
24,82	38,51	0,76	22,44	0,69	7,09
25,31	39,57	0,76	22,44	0,69	7,11
24,10	38,51	0,76	22,44	0,69	7,13
24,55	38,76	0,76	22,44	0,68	7,09
25,07	38,25	0,76	22,44	0,69	7,05
25,20	38,70	0,76	22,44	0,68	7,08
25,42	39,13	0,76	22,44	0,68	7,06
24,33	39,08	0,76	22,44	0,68	7,05
25,31	39,47	0,76	22,44	0,68	6,99
24,87	38,07	0,75	22,44	0,68	7,00
25,03	39,20	0,75	22,44	0,68	7,02
25,29	38,67	0,75	22,44	0,68	7,01
24,87	37,99	0,75	22,44	0,68	6,98
25,92	39,91	0,75	22,44	0,69	6,97
24,77	38,60	0,75	22,44	0,69	6,93
25,53	38,43	0,75	22,44	0,68	6,93

25,41	38,26	0,75	22,44	0,68	6,89
25,12	38,65	0,75	22,44	0,68	6,88
25,41	39,37	0,75	22,44	0,68	6,86
24,88	38,76	0,75	22,44	0,68	6,85
25,19	39,35	0,74	22,44	0,67	6,85
25,76	38,93	0,74	22,44	0,68	6,84
24,87	38,31	0,74	22,44	0,68	6,82
25,04	38,48	0,74	22,44	0,67	6,79
25,38	38,74	0,74	22,44	0,67	6,81
24,91	38,53	0,74	22,44	0,67	6,82
25,62	39,04	0,74	22,44	0,67	6,79
24,48	38,43	0,74	22,44	0,67	6,81
24,76	39,18	0,74	22,44	0,67	6,80
25,30	38,45	0,74	22,44	0,66	6,80
26,15	38,59	0,74	22,44	0,66	6,76
24,70	38,58	0,74	22,44	0,66	6,77
25,33	39,40	0,73	22,44	0,67	6,77
25,28	38,96	0,73	22,44	0,67	6,78
24,82	38,59	0,73	22,44	0,66	6,75
25,60	38,83	0,73	22,44	0,66	6,77
25,29	38,91	0,73	22,44	0,66	6,75
24,90	39,03	0,73	22,44	0,67	6,77
25,44	39,11	0,73	22,44	0,66	6,75
25,48	38,80	0,73	22,44	0,66	6,74
25,01	38,89	0,73	22,44	0,66	6,74
25,14	39,08	0,73	22,44	0,66	6,76
25,62	39,22	0,73	22,44	0,67	6,76
25,71	40,24	0,72	22,44	0,67	6,74
24,38	39,56	0,72	22,44	0,67	6,76
25,46	39,16	0,72	22,44	0,68	6,74
25,68	39,58	0,72	22,44	0,68	6,78
25,01	39,01	0,72	22,44	0,68	6,76
24,99	40,05	0,72	22,44	0,67	6,73
25,54	39,55	0,72	22,44	0,67	6,69
25,07	38,61	0,72	22,44	0,67	6,71
26,08	39,05	0,72	22,44	0,67	6,71
24,48	39,38	0,72	22,44	0,67	6,72
25,67	39,08	0,72	22,44	0,67	6,71
25,84	39,75	0,71	22,44	0,67	6,69
24,44	39,13	0,71	22,44	0,66	6,71
25,62	39,11	0,71	22,44	0,66	6,68
24,90	38,92	0,71	22,44	0,66	6,66
25,88	40,15	0,71	22,44	0,66	6,65
24,97	39,25	0,71	22,44	0,65	6,62
24,75	39,21	0,71	22,44	0,65	6,60
24,77	38,91	0,71	22,44	0,65	6,58
25,40	39,66	0,71	22,44	0,66	6,60
24,66	39,47	0,71	22,44	0,66	6,60

24,54	38,69	0,71	22,44	0,66	6,61
25,17	39,21	0,70	22,44	0,66	6,61
24,80	39,30	0,70	22,44	0,66	6,58
24,76	40,22	0,70	22,44	0,69	6,60
26,05	39,30	0,70	22,44	0,73	6,64
25,70	39,46	0,70	22,44	0,74	6,64
26,22	40,06	0,70	22,44	0,75	6,66
25,80	40,54	0,70	22,44	0,73	6,61
25,75	39,55	0,70	22,44	0,73	6,57
25,52	39,68	0,70	22,44	0,73	6,56
27,07	39,78	0,70	22,44	0,72	6,54
25,81	38,90	0,70	22,44	0,72	6,54
26,56	39,62	0,69	22,44	0,72	6,53
25,33	39,78	0,69	22,44	0,72	6,51
26,70	40,68	0,69	22,44	0,72	6,52
26,15	39,48	0,69	22,44	0,72	6,54
25,21	40,32	0,69	22,44	0,72	6,52
26,43	39,95	0,69	22,44	0,72	6,52
26,57	39,60	0,69	22,44	0,71	6,54
24,73	39,62	0,69	22,44	0,71	6,49
26,45	40,25	0,69	22,44	0,71	6,46
25,87	39,71	0,69	22,44	0,71	6,47
26,72	39,68	0,69	22,44	0,71	6,47
26,09	39,79	0,69	22,44	0,71	6,45
26,50	39,43	0,68	22,44	0,70	6,45
26,26	39,82	0,68	22,44	0,70	6,42
25,78	39,40	0,68	22,44	0,70	6,42
25,49	39,40	0,68	22,44	0,69	6,39
26,54	39,53	0,68	22,44	0,69	6,37
25,86	39,93	0,68	22,44	0,68	6,35
25,27	38,80	0,68	22,44	0,70	6,25
25,93	40,87	0,68	22,44	0,71	6,24
25,77	39,89	0,68	22,44	0,72	6,25
25,55	39,40	0,68	22,44	0,72	6,22
26,37	40,45	0,68	22,44	0,72	6,26
25,81	40,22	0,68	22,44	0,72	6,23
26,21	40,00	0,67	22,44	0,71	6,23
25,73	40,25	0,67	22,44	0,71	6,22
25,91	41,17	0,67	22,44	0,70	6,22
25,71	40,63	0,67	22,44	0,70	6,19
27,23	41,37	0,67	22,44	0,70	6,19
27,00	40,45	0,67	22,44	0,69	6,17
26,35	39,64	0,67	22,44	0,69	6,17
26,62	40,11	0,67	22,44	0,68	6,12
26,67	40,63	0,67	22,44	0,67	6,11
26,92	40,47	0,67	22,44	0,67	6,07
25,91	40,16	0,67	22,44	0,67	6,08
26,58	40,07	3,15	22,44	0,67	6,06

26,40	39,64	0,65	22,44	0,67	6,04
26,48	41,33	0,65	22,44	0,66	6,04
26,69	40,18	0,65	22,44	0,67	6,03
26,17	40,24	0,65	22,44	0,67	6,04
25,86	40,45	0,65	22,44	0,65	6,00

Annex 20

Title: HF2 logger data 060220

Pages total: 25, excl this cover page

Datotid	Rum - [°C]	Side-1 - [°C]	Side-2 - [°C]	Side-3 - [°C]	Side-4 - [°C]
		1	2	3	4
					5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
11:43:20	21,08	27,51	28,39	28,69	23,36
11:43:50	21,25	27,01	27,95	28,64	23,47
11:44:20	21,32	27,08	27,70	28,57	23,45
11:44:50	21,15	27,16	27,45	28,53	23,37
11:45:20	21,38	27,18	27,41	28,45	23,43
11:45:50	21,53	27,42	27,38	28,44	23,47
11:46:20	21,67	27,50	27,27	28,48	23,46
11:46:50	21,55	27,55	27,29	28,46	23,54
11:47:20	21,53	27,73	27,16	28,37	23,55
11:47:50	21,28	27,69	27,01	28,48	23,46
11:48:20	21,18	27,27	27,08	28,38	23,51
11:48:50	21,54	27,29	27,16	28,50	23,52
11:49:20	21,73	27,70	27,18	28,46	23,49
11:49:50	21,83	27,73	27,42	28,30	23,62
11:50:20	21,58	27,69	27,50	28,23	23,58
11:50:50	21,49	27,91	27,55	28,19	23,55
11:51:20	21,44	27,90	27,73	28,19	23,59
11:51:50	21,46	27,55	27,69	28,32	23,46
11:52:20	21,79	27,73	27,91	28,28	23,59
11:52:50	21,87	27,69	27,90	28,41	23,53
11:53:20	22,03	27,67	28,03	28,40	23,59
11:53:50	21,81	27,69	28,11	28,40	23,63
11:54:20	21,52	27,70	28,15	28,34	23,62
11:54:50	21,55	27,42	28,13	28,39	23,57
11:55:20	21,44	27,10	28,05	28,38	23,52
11:55:50	21,19	27,17	28,06	28,33	23,53
11:56:20	21,41	27,15	28,15	28,17	23,65
11:56:50	21,31	27,21	28,17	28,12	23,67
11:57:20	21,33	27,35	28,17	28,15	23,64
11:57:50	21,32	27,50	28,17	28,31	23,67
11:58:20	21,51	27,53	28,24	28,24	23,73
11:58:50	21,57	27,57	28,25	28,31	23,72
11:59:20	21,73	27,64	28,32	28,24	23,76
11:59:50	21,69	27,75	28,31	28,31	23,71
12:00:20	21,60	27,78	28,39	28,25	23,74
12:00:50	21,35	27,96	28,33	28,25	23,65
12:01:20	21,54	28,02	28,37	28,19	23,65
12:01:50	21,69	28,01	28,43	28,17	23,65
12:02:20	21,59	28,10	28,59	28,06	23,79
12:02:50	21,71	28,22	28,63	28,24	23,77
12:03:20	21,57	28,29	28,58	28,14	23,77
12:03:50	21,59	28,34	28,62	28,15	23,78
12:04:20	21,93	28,34	28,75	28,22	23,81

12:04:50	21,61	28,46	28,67	28,29	23,76
12:05:20	21,55	28,41	28,90	28,12	23,84
12:05:50	21,77	28,49	29,02	28,27	23,80
12:06:20	21,88	28,67	29,25	28,19	23,93
12:06:50	22,01	28,75	29,41	28,15	23,95
12:07:20	21,78	28,85	29,48	28,08	23,92
12:07:50	21,89	29,03	29,44	28,17	23,80
12:08:20	21,90	29,03	29,55	28,10	23,84
12:08:50	22,19	29,20	29,70	28,18	23,93
12:09:20	22,09	29,34	29,63	28,22	23,87
12:09:50	22,13	29,89	30,29	28,21	23,93
12:10:20	21,76	30,66	31,02	28,29	23,88
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12:11:50	22,16	30,14	30,74	28,24	24,08
12:12:20	22,36	30,08	30,52	28,20	24,05
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12:13:20	22,01	29,94	30,36	28,25	24,05
12:13:50	22,02	29,90	30,23	28,21	24,00
12:14:20	22,14	29,86	30,27	28,20	24,04
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12:17:20	22,55	29,58	30,14	28,29	24,26
12:17:50	22,20	29,65	29,95	28,34	24,17
12:18:20	22,17	29,56	30,01	28,40	24,19
12:18:50	22,03	29,69	29,94	28,38	24,25
12:19:20	22,01	29,64	29,90	28,41	24,21
12:19:50	22,02	29,65	29,87	28,32	24,22
12:20:20	22,33	29,75	29,94	28,31	24,34
12:20:50	21,90	29,86	29,78	28,34	24,26
12:21:20	22,05	29,80	29,76	28,33	24,24
12:21:50	22,10	29,82	29,81	28,34	24,35
12:22:20	22,10	29,82	29,83	28,32	24,43
12:22:50	22,30	29,80	29,79	28,40	24,39
12:23:20	22,08	29,89	29,62	28,47	24,24
12:23:50	22,46	29,96	29,76	28,54	24,34
12:24:20	22,54	29,84	29,95	28,51	24,40
12:24:50	22,59	29,82	30,01	28,38	24,47
12:25:20	22,21	29,79	30,04	28,34	24,45
12:25:50	22,39	29,96	30,07	28,51	24,40
12:26:20	22,11	29,92	30,12	28,43	24,41
12:26:50	22,53	29,80	30,27	28,34	24,50
12:27:20	22,30	29,87	30,15	28,36	24,36
12:27:50	22,25	29,87	30,35	28,31	24,52
12:28:20	22,44	29,83	30,28	28,39	24,47

12:28:50	22,30	29,74	30,39	28,32	24,55
12:29:20	22,18	29,81	30,38	28,40	24,52
12:29:50	22,22	29,85	30,33	28,46	24,45
12:30:20	22,61	29,76	30,38	28,42	24,53
12:30:50	22,38	29,68	30,40	28,44	24,51
12:31:20	22,29	29,76	30,43	28,53	24,55
12:31:50	22,17	29,90	30,30	28,58	24,46
12:32:20	22,24	29,95	30,24	28,49	24,48
12:32:50	22,06	29,96	30,25	28,39	24,53
12:33:20	22,23	30,00	30,40	28,37	24,68
12:33:50	22,25	30,05	30,31	28,48	24,56
12:34:20	21,97	30,13	30,24	28,32	24,57
12:34:50	22,27	30,10	30,34	28,26	24,65
12:35:20	22,29	30,23	30,22	28,38	24,55
12:35:50	22,33	30,17	30,27	28,23	24,62
12:36:20	22,28	30,14	30,32	28,09	24,67
12:36:50	22,19	30,34	30,21	28,28	24,61
12:37:20	22,20	30,22	30,31	28,17	24,68
12:37:50	22,05	30,29	30,19	28,29	24,55
12:38:20	22,47	30,19	30,27	28,12	24,69
12:38:51	22,43	30,34	30,23	28,22	24,67
12:39:21	22,19	30,32	30,13	28,29	24,60
12:39:51	22,11	30,32	30,07	28,25	24,59
12:40:21	22,17	30,26	30,11	28,15	24,63
12:40:51	22,14	30,27	30,22	28,16	24,74
12:41:21	22,12	30,30	30,03	28,23	24,61
12:41:51	22,90	30,18	30,15	28,14	24,69
12:42:21	22,63	30,17	30,07	28,05	24,67
12:42:51	22,31	30,23	30,08	28,14	24,64
12:43:21	22,33	30,12	29,70	28,15	24,73
12:43:51	22,81	30,07	29,54	28,12	24,72
12:44:21	22,72	30,15	29,37	28,58	24,61
12:44:51	22,64	30,20	29,37	28,91	24,66
12:45:21	22,53	30,25	29,41	29,13	24,63
12:45:51	22,86	30,15	29,59	29,17	24,74
12:46:21	22,79	30,30	29,52	29,29	24,70
12:46:51	22,48	30,41	23,44	29,51	24,67
12:47:21	22,86	30,35	24,08	29,49	24,82
12:47:51	22,51	30,45	24,11	29,56	24,69
12:48:21	22,55	30,49	24,26	29,69	24,73
12:48:51	22,79	30,48	23,31	29,66	24,84
12:49:21	22,85	30,46	22,97	29,73	24,83
12:49:51	22,91	30,52	22,92	29,80	24,78
12:50:21	22,71	30,61	22,61	29,83	24,69
12:50:51	22,69	30,57	22,52	29,83	24,84
12:51:21	22,78	30,55	22,52	29,89	24,78
12:51:51	22,70	30,53	22,76	29,90	24,86
12:52:21	22,75	30,54	22,80	29,94	24,87

12:52:51	22,70	30,74	22,75	30,02	24,81
12:53:21	23,00	30,53	23,27	29,97	24,95
12:53:51	22,45	30,65	22,98	29,98	24,84
12:54:21	22,36	30,61	22,87	30,00	24,80
12:54:51	22,66	30,64	22,87	30,07	24,88
12:55:21	22,39	30,62	22,63	30,05	24,88
12:55:51	22,82	30,46	22,80	30,01	25,00
12:56:21	22,44	30,64	22,82	30,10	24,94
12:56:51	22,58	30,57	22,68	30,14	24,97
12:57:21	22,52	30,49	22,85	30,16	25,05
12:57:51	22,79	30,47	22,70	30,19	25,03
12:58:21	22,70	30,52	22,65	30,33	25,10
12:58:51	22,56	30,48	22,83	30,36	25,10
12:59:21	22,44	30,48	22,88	30,39	25,10
12:59:51	22,79	30,54	22,91	30,42	25,10
13:00:21	22,80	30,58	22,73	30,55	25,03
13:00:51	22,61	30,43	23,04	30,47	25,13
13:01:21	22,65	30,40	22,95	30,45	25,09
13:01:51	22,97	30,61	23,06	30,62	25,04
13:02:21	23,04	30,40	23,03	30,52	25,14
13:02:51	22,96	30,48	23,06	30,58	25,09
13:03:21	23,06	30,47	23,30	30,58	25,05
13:03:51	23,07	30,39	23,26	30,51	25,14
13:04:21	22,97	30,36	23,19	30,51	25,07
13:04:51	23,23	30,40	22,98	30,56	25,06
13:05:21	23,17	30,38	22,97	30,54	25,10
13:05:51	22,78	30,38	22,73	30,52	25,13
13:06:21	22,51	30,21	22,95	30,44	25,23
13:06:51	22,48	30,38	22,86	30,54	25,13
13:07:21	22,63	30,21	22,82	30,41	25,26
13:07:51	23,00	30,40	22,57	30,50	25,16
13:08:21	22,98	30,35	23,00	30,43	25,24
13:08:51	22,77	30,55	22,89	30,48	25,13
13:09:21	23,10	30,54	22,94	30,47	25,23
13:09:51	22,94	30,50	22,80	30,40	25,31
13:10:21	22,97	30,51	22,85	30,36	25,30
13:10:51	22,59	30,46	22,71	30,28	25,27
13:11:21	22,48	30,63	22,81	30,29	25,25
13:11:51	22,50	30,81	22,64	30,42	25,20
13:12:21	22,53	30,71	22,86	30,37	25,26
13:12:51	22,62	30,61	22,59	30,23	25,24
13:13:21	22,59	30,83	22,75	30,40	25,21
13:13:51	22,67	30,69	23,02	30,30	25,35
13:14:21	22,72	30,73	22,93	30,25	25,26
13:14:51	22,96	30,74	22,65	30,31	25,24
13:15:21	22,72	30,71	23,05	30,30	25,23
13:15:51	23,10	30,76	23,09	30,34	25,27
13:16:21	22,79	30,66	23,04	30,26	25,33

13:16:51	23,11	30,51	22,78	30,30	25,33
13:17:21	23,13	30,60	22,88	30,38	25,23
13:17:51	23,24	30,64	23,04	30,47	25,35
13:18:21	23,00	30,64	23,19	30,48	25,28
13:18:51	22,92	30,57	22,95	30,46	25,25
13:19:21	22,68	30,40	22,77	30,36	25,37
13:19:51	23,10	30,41	22,88	30,40	25,41
13:20:21	23,24	30,43	22,86	30,47	25,42
13:20:51	23,19	30,35	23,11	30,40	25,40
13:21:21	22,97	30,45	22,93	30,47	25,27
13:21:51	22,99	30,46	22,83	30,51	25,28
13:22:21	23,01	30,45	23,12	30,53	25,40
13:22:51	23,05	30,37	23,18	30,49	25,43
13:23:21	22,69	30,32	22,84	30,41	25,44
13:23:51	22,76	30,31	22,59	30,36	25,39
13:24:21	23,38	30,16	22,81	30,32	25,45
13:24:51	23,22	30,24	23,05	30,37	25,50
13:25:21	22,99	30,28	22,89	30,37	25,33
13:25:51	23,08	30,24	22,92	30,35	25,36
13:26:21	22,91	30,28	22,66	30,31	25,37
13:26:51	22,72	30,27	22,51	30,24	25,39
13:27:21	23,04	30,24	22,99	30,27	25,50
13:27:51	22,81	30,17	22,60	30,19	25,47
13:28:21	22,85	29,91	22,51	30,17	25,40
13:28:51	23,02	28,47	22,41	29,81	25,53
13:29:21	23,02	28,99	21,99	27,47	25,49

Side-5 - [°C]	Side-6 - [°C]	Bag-7 - [°C]	Bag-8 - [°C]	Bag-9 - [°C]	Bag-11 - [°C]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [l/n/min]
17,61	19,59	25,91	25,59	22,04	6,67
17,19	19,16	26,14	25,75	22,01	6,68
17,02	18,87	26,19	25,76	22,03	6,72
17,01	18,57	26,24	25,78	22,10	6,75
16,82	18,45	26,22	25,76	22,07	6,76
16,77	18,30	26,19	25,80	22,06	6,78
16,75	18,22	26,24	25,81	22,05	6,77
16,63	18,15	26,19	25,82	22,05	6,76
16,51	18,11	26,20	25,84	21,98	6,77
16,58	17,92	26,18	25,81	22,07	6,75
16,44	17,90	26,14	25,83	22,00	6,74
16,51	17,83	26,19	25,84	22,09	6,73
16,44	17,74	26,17	25,85	22,10	6,72
16,28	17,79	26,14	25,85	22,00	6,68
16,23	17,75	26,13	25,87	22,02	6,68
16,21	17,67	26,12	25,84	22,04	6,67
16,14	17,66	26,09	25,82	22,04	6,72
16,19	17,52	26,14	25,76	22,16	6,71
16,08	17,59	26,10	25,79	22,06	6,69
16,21	17,50	26,16	25,80	22,15	6,66
16,12	17,53	26,13	25,77	22,14	6,70
16,07	17,52	26,12	25,77	22,10	6,67
16,07	17,50	26,08	25,81	22,07	6,68
16,07	17,40	26,10	25,76	22,19	6,68
16,12	17,31	26,13	25,77	22,24	6,64
16,10	17,35	26,12	25,77	22,24	6,65
15,95	17,43	26,05	25,76	22,16	6,67
15,92	17,38	26,04	25,78	22,11	6,65
15,93	17,35	26,06	25,78	22,18	6,66
15,98	17,31	26,11	25,75	22,29	6,65
15,94	17,36	26,05	25,79	22,21	6,76
15,90	17,31	26,08	25,73	22,29	6,72
15,86	17,34	26,03	25,78	22,21	6,69
15,89	17,28	26,06	25,73	22,32	6,73
15,82	17,31	26,04	25,74	22,26	6,67
15,91	17,22	26,06	25,73	22,30	6,62
15,86	17,21	26,04	25,72	22,29	6,59
15,84	17,19	26,02	25,70	22,33	6,67
15,77	17,31	26,05	25,78	22,23	6,64
15,86	17,24	26,03	25,74	22,31	6,61
15,81	17,24	26,04	25,75	22,25	6,68
15,76	17,24	26,04	25,75	22,25	6,74
15,78	17,20	26,02	25,72	22,30	6,68

15,78	17,15	26,04	25,70	22,33	6,67
15,68	17,23	26,01	25,74	22,26	6,63
15,75	17,13	26,01	25,70	22,35	6,59
15,69	17,23	26,05	25,76	22,27	6,57
15,68	17,21	25,99	25,77	22,22	6,69
15,63	17,19	25,99	25,76	22,24	6,70
15,77	17,06	25,99	25,68	22,38	6,71
15,71	17,11	26,02	25,71	22,36	6,69
15,73	17,19	26,04	25,74	22,39	6,69
15,79	17,13	26,06	25,74	22,42	6,71
15,70	17,18	26,02	25,73	22,31	6,63
15,71	17,14	26,01	25,71	22,36	6,64
15,65	17,20	26,01	25,75	22,36	6,70
15,77	17,12	26,05	25,72	22,45	6,71
15,66	17,21	26,02	25,75	22,35	6,67
15,68	17,20	26,01	25,75	22,32	6,69
15,68	17,19	25,98	25,77	22,30	6,71
15,80	17,14	26,04	25,81	22,43	6,71
15,80	17,09	26,06	25,75	22,48	6,71
15,77	17,09	26,02	25,71	22,48	6,67
15,69	17,20	26,04	25,76	22,41	6,68
15,68	17,22	26,02	25,78	22,39	6,67
15,77	17,12	26,01	25,76	22,50	6,68
15,79	17,07	26,04	25,72	22,51	6,67
15,83	17,09	26,05	25,74	22,56	6,68
15,67	17,16	26,03	25,79	22,45	6,66
15,67	17,05	26,04	25,76	22,48	6,68
15,72	17,07	26,04	25,77	22,54	6,65
15,68	17,08	26,08	25,76	22,51	6,73
15,73	17,04	26,06	25,76	22,61	6,73
15,67	17,05	26,06	25,74	22,58	6,71
15,68	17,12	26,09	25,79	22,58	6,72
15,72	17,00	26,09	25,79	22,58	6,73
15,73	17,00	26,07	25,75	22,64	6,72
15,69	17,07	26,09	25,80	22,59	6,72
15,64	17,13	26,10	25,84	22,52	6,71
15,63	17,05	26,08	25,78	22,53	6,69
15,77	16,96	26,11	25,78	22,65	6,70
15,81	17,02	26,13	25,82	22,67	6,70
15,75	17,05	26,10	25,81	22,64	6,70
15,66	17,09	26,09	25,84	22,53	6,69
15,64	17,12	26,08	25,87	22,56	6,70
15,79	17,07	26,13	25,85	22,68	6,68
15,78	17,08	26,12	25,85	22,67	6,69
15,67	17,18	26,08	25,83	22,61	6,69
15,84	17,09	26,15	25,82	22,73	6,68
15,79	17,21	26,15	25,90	22,64	6,66
15,82	17,14	26,14	25,82	22,76	6,67

15,71	17,22	26,11	25,86	22,62	6,67
15,85	17,22	26,15	25,91	22,72	6,73
15,88	17,18	26,20	25,89	22,78	6,71
15,75	17,24	26,17	25,92	22,65	6,71
15,79	17,18	26,11	25,89	22,72	6,72
15,84	17,20	26,18	25,94	22,80	6,72
15,88	17,14	26,21	25,88	22,82	6,72
15,82	17,16	26,20	25,90	22,77	6,71
15,76	17,19	26,20	25,88	22,75	6,68
15,77	17,26	26,21	25,96	22,75	6,71
15,89	17,16	26,20	25,90	22,86	6,68
15,83	17,18	26,22	25,93	22,77	6,71
15,83	17,22	26,20	25,97	22,78	6,69
15,97	17,12	26,25	25,94	22,90	6,71
15,91	17,18	26,24	25,94	22,85	6,68
15,80	17,24	26,19	25,94	22,77	6,70
15,98	17,17	26,27	25,95	22,89	6,69
15,89	17,26	26,26	25,99	22,87	6,66
15,95	17,16	26,25	25,95	22,89	6,68
15,82	17,23	26,24	25,98	22,79	6,66
15,88	17,22	26,27	26,00	22,84	6,66
15,97	17,17	26,30	25,99	22,91	6,65
15,91	17,16	26,28	25,98	22,94	6,66
15,83	17,21	26,25	25,98	22,85	6,68
15,83	17,29	26,29	26,06	22,86	6,66
15,93	17,17	26,31	26,01	22,98	6,73
15,81	17,24	26,28	26,00	22,88	6,69
15,87	17,25	26,28	26,02	22,87	6,69
15,97	17,23	26,35	26,02	22,98	6,71
15,83	17,28	26,30	26,04	22,92	6,70
15,79	17,21	26,30	26,03	22,91	6,71
15,90	17,08	26,35	26,00	23,00	6,69
15,94	17,14	26,38	26,05	23,02	6,67
15,94	17,14	26,37	26,03	23,02	6,66
15,82	17,21	26,34	26,05	22,95	6,68
15,84	17,20	26,36	26,05	22,93	6,67
15,97	17,23	26,37	26,05	23,06	6,68
15,84	17,34	26,34	26,09	22,91	6,67
15,91	17,24	26,36	26,07	23,02	6,68
15,95	17,28	26,40	26,06	23,05	6,68
15,91	17,37	26,40	26,13	22,99	6,69
15,86	17,43	26,40	26,11	23,00	6,66
15,90	17,37	26,40	26,10	23,02	6,69
15,99	17,31	26,40	26,10	23,06	6,66
15,95	17,41	26,43	26,18	23,01	6,67
15,97	17,40	26,43	26,11	23,09	6,66
15,95	17,45	26,41	26,12	22,99	6,67
15,99	17,46	26,44	26,13	23,05	6,67

16,09	17,43	26,47	26,16	23,13	6,64
15,99	17,50	26,45	26,15	23,01	6,65
16,08	17,36	26,44	26,17	23,06	6,84
16,06	17,36	26,46	26,14	23,12	6,83
16,13	17,40	26,50	26,19	23,14	6,82
16,11	17,40	26,49	26,18	23,13	6,82
16,03	17,47	26,44	26,18	23,01	6,84
16,17	17,40	26,53	26,24	23,18	6,77
16,11	17,43	26,51	26,21	23,13	6,78
16,06	17,46	26,49	26,22	23,04	6,78
16,01	17,46	26,48	26,21	23,05	6,76
16,02	17,48	26,52	26,23	23,11	6,75
16,00	17,50	26,54	26,24	23,09	6,78
15,98	17,49	26,51	26,23	23,06	6,77
16,02	17,50	26,51	26,27	23,11	6,77
16,13	17,43	26,59	26,24	23,17	6,75
16,02	17,54	26,54	26,28	23,15	6,75
15,98	17,53	26,56	26,29	23,14	6,73
16,16	17,47	26,57	26,29	23,22	6,73
16,06	17,57	26,56	26,32	23,16	6,72
16,09	17,50	26,55	26,28	23,17	6,72
16,09	17,50	26,57	26,28	23,17	6,71
16,13	17,55	26,61	26,36	23,20	6,70
16,10	17,52	26,62	26,31	23,22	6,70
16,13	17,48	26,60	26,30	23,18	6,68
16,19	17,53	26,62	26,31	23,23	6,66
16,24	17,55	26,65	26,33	23,23	6,68
16,19	17,63	26,62	26,37	23,21	6,67
16,25	17,53	26,61	26,30	23,21	6,68
16,21	17,65	26,67	26,40	23,22	6,69
16,26	17,59	26,65	26,35	23,24	6,68
16,24	17,63	26,62	26,38	23,23	6,86
16,27	17,57	26,64	26,32	23,23	6,85
16,32	17,63	26,67	26,37	23,28	6,84
16,20	17,72	26,70	26,40	23,26	6,84
16,18	17,68	26,68	26,38	23,25	6,84
16,13	17,71	26,69	26,43	23,25	6,81
16,24	17,71	26,71	26,43	23,28	6,82
16,32	17,65	26,69	26,40	23,28	6,78
16,26	17,70	26,67	26,39	23,26	6,76
16,17	17,73	26,71	26,43	23,27	6,75
16,29	17,66	26,72	26,41	23,32	6,75
16,25	17,78	26,70	26,44	23,29	6,75
16,22	17,72	26,74	26,46	23,29	6,73
16,25	17,69	26,71	26,41	23,33	6,73
16,27	17,69	26,73	26,43	23,33	6,75
16,31	17,72	26,77	26,43	23,35	6,71
16,24	17,80	26,74	26,48	23,30	6,70

16,20	17,83	26,76	26,48	23,35	6,71
16,29	17,75	26,74	26,45	23,34	6,70
16,32	17,79	26,79	26,48	23,39	6,68
16,35	17,75	26,80	26,47	23,37	6,67
16,38	17,72	26,82	26,49	23,38	6,66
16,27	17,86	26,77	26,51	23,36	6,64
16,30	17,91	26,84	26,54	23,39	6,72
16,31	17,88	26,82	26,54	23,41	6,66
16,32	17,89	26,83	26,56	23,39	6,69
16,41	17,75	26,84	26,51	23,42	6,67
16,43	17,75	26,79	26,50	23,44	6,67
16,44	17,84	26,85	26,55	23,47	6,66
16,41	17,84	26,87	26,55	23,46	6,66
16,39	17,87	26,85	26,57	23,47	6,69
16,41	17,79	26,85	26,58	23,41	6,70
16,34	17,89	26,84	26,58	23,45	6,68
16,43	17,95	26,90	26,60	23,48	6,68
16,51	17,84	26,91	26,59	23,53	6,66
16,51	17,87	26,91	26,59	23,50	6,66
16,51	17,82	26,91	26,59	23,49	6,67
16,48	17,85	26,91	26,59	23,48	6,66
16,50	17,95	26,91	26,64	23,49	6,66
16,51	17,92	26,89	26,63	23,54	6,65
16,60	17,87	26,94	26,64	23,53	8,28
16,43	17,99	26,89	26,65	23,49	8,30
16,37	17,95	26,90	26,63	23,51	8,25

Bag-12 - [°C]	NS-Røgtemp - [°C]	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
6,75	21,59	22,25	23,90	23,06	24,25
6,79	24,71	22,33	23,90	23,09	24,24
6,75	23,79	22,52	23,95	23,13	24,31
6,77	23,69	22,76	23,97	23,12	24,41
6,81	24,08	23,17	23,98	23,21	24,47
6,81	24,51	23,71	23,97	23,31	24,61
6,82	25,18	24,32	24,01	23,37	24,81
6,84	25,82	25,12	24,01	23,54	25,02
6,85	26,91	26,02	24,03	23,70	25,32
6,75	28,58	27,18	24,08	23,85	25,73
6,75	30,66	28,67	24,11	24,10	26,17
6,73	33,83	30,46	24,17	24,39	26,70
6,73	38,46	32,76	24,23	24,76	27,36
6,72	47,65	35,99	24,28	25,21	28,12
6,71	56,58	39,65	24,37	25,74	29,08
6,69	69,68	43,97	24,48	26,33	30,31
6,69	77,11	48,33	24,61	27,08	31,68
6,67	86,06	53,69	24,80	27,90	33,31
6,66	91,87	59,23	24,96	28,82	35,04
6,61	102,22	64,71	25,19	29,69	36,96
6,71	108,07	70,71	25,42	30,80	38,93
6,72	115,88	76,93	25,68	31,93	41,14
6,71	122,04	83,82	26,02	33,14	43,54
6,68	123,06	89,92	26,42	34,49	46,00
6,66	120,82	95,55	26,86	35,85	48,50
6,66	116,51	99,96	27,34	37,20	50,93
6,66	116,70	104,07	27,86	38,56	53,22
6,76	118,71	108,10	28,40	39,85	55,51
6,75	126,26	112,91	29,01	41,17	57,83
6,73	136,70	118,85	29,70	42,56	60,22
6,71	145,51	125,65	30,40	43,95	62,71
6,70	158,83	134,06	31,14	45,46	65,30
6,66	179,07	145,98	31,93	46,93	68,24
6,82	190,88	160,47	32,84	48,56	71,61
6,80	200,57	176,72	33,79	50,34	75,48
6,76	199,96	192,60	34,83	52,30	79,68
6,69	199,78	206,84	35,90	54,61	84,07
6,68	201,29	220,17	37,13	57,14	88,41
6,64	204,11	232,36	38,64	59,94	92,75
6,63	206,26	243,54	40,33	62,79	97,04
6,57	207,63	254,24	42,09	65,76	101,41
6,79	210,21	264,14	43,83	68,82	105,74
6,78	213,76	273,25	45,66	71,98	110,06

6,74	217,96	281,88	47,51	75,15	114,40
6,71	222,21	290,60	49,39	78,45	118,93
6,70	223,94	297,98	51,30	81,84	123,65
6,67	227,22	306,02	53,27	85,40	128,64
6,74	224,81	313,41	55,24	88,92	133,83
6,74	223,08	318,76	57,25	92,55	139,13
6,73	223,31	322,55	59,31	96,07	144,33
6,69	220,86	325,52	61,33	99,65	149,26
6,68	217,20	327,19	63,43	103,32	154,09
6,69	213,28	327,77	65,48	106,84	158,61
6,60	211,35	323,01	66,79	110,72	162,60
6,67	182,38	315,00	68,07	114,85	166,06
6,82	197,73	310,95	69,89	118,52	168,96
6,69	193,86	307,50	71,49	121,61	171,55
6,69	192,89	303,95	72,95	124,43	173,88
6,71	194,28	300,70	74,53	126,90	175,87
6,69	191,07	297,84	76,27	129,26	177,60
6,69	187,10	294,53	77,63	131,35	179,01
6,69	184,64	291,02	79,48	133,24	180,23
6,61	175,92	287,14	81,35	135,12	181,06
6,73	190,87	285,36	82,87	136,71	181,70
6,70	197,41	284,82	84,38	138,21	182,20
6,70	198,30	284,51	85,89	139,60	182,76
6,69	196,91	284,02	87,24	140,85	183,28
6,72	195,73	283,71	88,48	142,10	183,73
6,69	195,94	283,45	89,65	143,28	184,12
6,70	195,13	282,97	90,75	144,33	184,58
6,71	196,51	282,66	91,77	145,45	184,94
6,71	196,58	282,92	92,78	146,59	185,30
6,69	192,56	282,13	93,66	147,66	185,59
6,69	188,61	281,04	94,52	148,66	185,83
6,70	187,30	279,52	95,36	149,57	186,03
6,70	189,20	278,52	96,13	150,29	186,23
6,70	188,39	277,74	96,88	150,93	186,29
6,68	186,14	276,69	97,56	151,76	186,31
6,69	182,85	274,99	98,25	152,36	186,51
6,79	182,60	273,31	98,89	152,95	186,54
6,73	180,74	271,42	99,58	153,37	186,60
6,74	180,53	269,86	100,23	153,80	186,72
6,72	181,54	268,72	100,82	154,28	186,64
6,73	185,98	267,86	101,45	154,61	186,52
6,72	191,40	268,54	102,10	154,94	186,46
6,72	194,89	269,93	102,74	155,25	186,51
6,73	195,86	271,89	103,42	155,74	186,90
6,72	196,09	273,97	104,04	156,26	187,30
6,71	195,22	275,66	104,75	156,82	187,99
6,72	195,05	277,20	105,49	157,42	188,75
6,69	196,44	278,77	106,25	158,04	189,49

6,71	196,07	280,01	107,17	158,81	190,49
6,70	195,71	281,28	108,08	159,59	191,55
6,67	196,06	282,04	109,05	160,23	192,58
6,68	195,77	282,97	110,04	160,95	193,68
6,68	195,49	284,04	111,14	161,76	194,68
6,67	197,60	285,10	112,27	162,54	195,85
6,71	196,34	285,92	113,41	163,27	197,00
6,72	197,76	286,87	114,59	164,10	198,16
6,72	196,90	287,57	115,76	164,90	199,27
6,69	197,62	288,17	117,02	165,72	200,45
6,67	198,54	288,91	118,25	166,48	201,52
6,68	199,04	289,72	119,54	167,26	202,74
6,69	199,13	290,70	120,79	168,05	203,82
6,70	199,76	291,73	122,02	168,71	204,81
6,67	200,78	293,11	123,37	169,64	205,94
6,68	201,11	294,10	124,61	170,56	207,01
6,67	204,24	295,58	125,92	171,46	208,15
6,65	207,33	297,98	127,21	172,48	209,27
6,65	207,64	300,14	128,46	173,37	210,53
6,77	205,52	301,73	129,81	174,49	211,87
6,76	205,99	302,82	131,07	175,33	213,24
6,77	204,31	303,67	132,31	176,34	214,69
6,76	203,71	304,38	133,51	177,37	216,08
6,77	204,11	304,75	134,71	178,50	217,45
6,77	204,11	305,06	135,91	179,56	218,75
6,74	204,47	305,20	137,00	180,54	220,05
6,74	204,01	305,83	138,13	181,63	221,18
6,73	205,55	306,37	139,22	182,56	222,41
6,75	205,55	307,12	140,29	183,57	223,57
7,67	206,48	307,72	141,35	184,61	224,73
7,65	205,82	308,26	142,33	185,69	225,81
7,65	206,92	309,09	143,33	186,54	226,84
7,65	207,35	309,94	144,34	187,43	228,01
6,77	209,03	310,94	145,37	188,43	229,13
6,78	209,33	312,08	146,37	189,44	230,24
6,72	210,02	313,47	147,36	190,29	231,42
6,75	210,01	314,80	148,34	191,18	232,55
6,73	210,69	316,29	149,31	192,22	233,65
6,74	211,45	317,73	150,44	193,13	234,86
6,71	212,44	318,91	151,48	194,12	236,10
6,70	211,70	320,24	152,55	195,04	237,29
6,66	213,06	321,39	153,61	196,08	238,41
6,66	212,90	322,47	154,73	197,08	239,63
6,69	211,86	323,26	155,88	198,16	240,88
6,66	211,57	324,10	157,01	199,03	241,98
6,66	213,05	325,00	158,09	199,96	243,10
6,63	214,32	326,54	159,22	200,73	244,06
6,63	214,64	328,26	160,31	201,73	245,03

6,61	215,70	330,09	161,49	202,54	245,80
6,59	215,69	331,89	162,58	203,40	246,57
6,75	215,71	333,46	163,75	204,23	247,13
6,80	215,60	334,88	164,95	205,07	247,78
6,76	215,07	336,20	166,21	206,06	248,34
6,77	216,12	337,48	167,53	206,97	248,96
6,78	216,00	338,63	168,82	207,80	249,39
6,71	217,78	339,61	170,18	208,54	249,89
6,73	217,21	340,63	171,53	209,45	250,30
6,73	216,76	341,41	172,94	210,23	250,78
6,69	217,13	341,70	174,29	211,15	251,37
6,71	215,68	341,93	175,66	211,81	251,69
6,65	215,47	341,81	177,08	212,53	252,30
6,69	215,07	341,66	178,48	213,21	252,92
6,65	215,20	341,74	179,88	214,02	253,53
6,73	215,33	341,83	181,33	214,79	254,10
6,72	215,17	341,62	182,69	215,32	254,63
6,69	214,00	341,10	184,05	215,99	255,30
6,69	213,08	340,65	185,43	216,50	255,95
6,70	211,71	340,04	186,70	217,09	256,61
6,66	211,44	339,34	187,93	217,79	257,37
6,74	211,52	338,07	189,16	218,34	258,02
6,76	210,06	337,36	190,38	218,85	258,68
6,73	210,48	336,63	191,60	219,39	259,25
6,74	208,76	335,66	192,78	220,04	260,09
6,73	207,98	334,39	193,92	220,71	260,58
6,72	207,10	332,87	195,06	221,25	261,21
6,70	204,66	331,64	196,23	221,84	261,58
6,72	205,92	329,99	197,35	222,18	261,98
6,71	205,06	328,72	198,44	222,68	262,27
6,69	204,44	327,28	199,52	223,09	262,57
6,69	203,83	325,92	200,57	223,43	262,64
6,66	203,25	324,44	201,59	223,66	262,78
6,64	201,87	322,97	202,68	224,09	262,96
6,67	201,31	321,53	203,65	224,31	262,77
6,66	200,98	320,29	204,67	224,55	263,03
6,63	200,23	318,69	205,71	224,64	262,95
6,64	200,09	317,35	206,67	224,84	262,96
6,73	199,26	315,87	207,63	224,96	262,87
6,73	198,03	314,59	208,60	225,19	262,78
6,71	197,84	313,02	209,49	225,24	262,70
6,70	198,18	312,07	210,41	225,35	262,56
6,72	198,44	311,09	211,31	225,55	262,39
6,68	197,11	310,19	212,25	225,67	262,29
6,66	196,72	309,30	213,11	225,61	262,08
6,70	196,40	308,65	213,95	225,69	261,75
6,70	194,74	307,74	214,84	225,77	261,70
6,70	194,90	307,16	215,72	225,90	261,47

6,70	195,69	306,23	216,56	225,89	261,25
6,64	195,01	305,70	217,45	225,91	261,13
6,69	193,82	305,00	218,27	225,99	260,91
6,66	193,08	304,41	219,10	226,12	260,91
6,68	192,94	303,79	219,92	226,24	260,80
6,67	193,00	302,97	220,70	226,21	260,69
6,68	192,70	302,42	221,46	226,40	260,62
6,65	191,78	301,65	222,27	226,34	260,57
6,61	191,76	301,22	223,08	226,41	260,52
6,62	189,45	300,21	223,79	226,59	260,47
6,76	189,18	299,07	224,58	226,70	260,43
6,75	187,87	297,87	225,22	226,80	260,25
6,73	188,07	296,23	225,98	226,84	260,15
6,73	186,99	295,16	226,58	226,81	259,90
6,70	186,36	293,83	227,26	226,73	259,55
6,70	185,65	292,44	227,81	226,75	259,07
6,68	184,50	290,93	228,39	226,70	258,53
6,70	183,92	289,93	229,05	226,61	258,18
6,68	184,06	288,68	229,63	226,67	257,69
6,68	183,75	287,34	230,10	226,62	257,06
6,66	181,92	285,91	230,66	226,58	256,53
6,67	180,61	284,51	231,17	226,63	255,95
6,67	179,37	282,74	231,71	226,59	255,41
6,65	178,52	281,22	232,19	226,31	254,68
7,63	177,51	279,34	232,66	226,09	254,09
7,58	168,72	275,06	233,09	227,38	253,18

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
22,17	24,71	0,72	25,95	40,64	1,47
22,17	24,77	0,76	26,51	41,46	1,41
22,21	24,74	0,88	26,56	40,99	1,41
22,23	24,64	0,63	26,95	41,17	1,41
22,21	24,61	0,76	27,27	41,38	1,40
22,23	24,63	1,01	27,71	41,19	1,40
22,22	24,53	1,22	26,38	41,10	1,40
22,23	24,49	0,99	26,04	40,14	1,40
22,23	24,50	1,31	26,68	41,10	1,40
22,22	24,42	1,67	26,78	40,65	1,40
22,26	24,43	2,10	25,43	41,26	1,39
22,22	24,43	2,81	25,91	40,81	1,39
22,23	24,43	3,26	25,71	40,55	1,38
22,26	24,46	4,56	26,44	41,39	1,37
22,27	24,60	5,65	25,53	40,33	1,37
22,27	24,71	6,96	26,51	42,22	1,35
22,29	24,84	7,67	27,01	41,08	1,34
22,32	25,02	8,78	26,07	40,62	1,33
22,38	25,24	9,20	26,91	41,83	1,32
22,41	25,45	10,59	25,98	40,74	1,30
22,43	25,77	10,41	25,58	40,70	1,28
22,48	26,14	11,23	26,67	41,76	1,26
22,58	26,59	11,52	26,75	41,29	1,24
22,63	26,86	11,72	26,30	41,31	1,22
22,72	27,03	11,52	26,38	41,37	1,20
22,83	27,17	11,26	26,31	40,28	1,18
22,97	27,27	11,03	26,71	40,62	1,17
23,15	27,38	11,16	25,87	41,24	1,15
23,31	27,55	11,87	26,56	41,51	1,13
23,49	27,82	12,91	26,69	40,49	1,11
23,78	28,08	13,47	26,50	41,92	1,07
24,01	28,46	14,63	26,84	41,88	1,03
24,30	29,02	15,69	27,81	41,43	1,00
24,56	29,75	16,31	25,90	40,66	0,95
24,90	30,50	16,67	26,43	41,84	0,90
25,26	31,15	16,68	25,93	41,28	0,87
25,67	31,65	16,27	25,83	41,13	0,82
26,15	32,15	16,18	26,55	40,92	0,79
26,75	32,52	16,47	26,00	41,06	0,75
27,35	32,91	16,56	25,66	41,34	0,72
28,07	33,29	16,56	27,53	41,22	0,69
28,93	33,58	16,86	27,36	41,04	0,66
29,93	33,86	17,23	26,88	42,74	0,62

30,98	34,10	16,98	25,71	40,17	0,59
32,28	34,48	17,09	26,55	41,30	0,56
33,64	34,80	17,37	26,55	41,11	0,53
35,25	35,17	17,57	26,82	40,39	0,50
36,96	35,43	17,13	25,62	39,89	0,47
38,84	35,59	16,90	26,10	40,02	0,44
40,80	35,74	17,08	26,70	41,34	0,41
42,96	35,89	16,84	26,61	42,92	0,39
45,32	36,00	16,54	25,39	41,02	0,37
47,75	35,94	16,40	25,64	40,89	0,35
50,30	40,45	22,35	24,40	42,87	1,48
52,96	47,61	17,82	26,59	43,64	3,99
55,70	46,97	16,13	26,31	41,21	3,41
58,41	43,65	15,69	25,30	40,32	3,39
61,22	41,19	15,71	26,06	40,43	3,38
63,94	39,58	15,75	25,65	39,84	3,36
66,69	38,49	15,53	25,26	41,03	3,34
69,25	37,65	15,12	26,13	42,31	3,33
71,73	37,03	15,10	25,84	40,20	3,31
74,11	37,11	15,15	25,14	40,69	3,30
76,45	37,00	15,59	25,86	40,34	3,28
78,72	36,75	15,75	25,48	40,46	3,26
80,77	36,50	16,03	25,99	41,31	3,25
82,76	36,32	15,61	27,71	43,56	3,23
84,68	36,17	16,15	25,88	40,22	3,21
86,48	36,06	15,79	26,36	41,44	3,19
88,10	36,00	15,73	26,61	40,34	3,17
89,69	35,98	15,81	26,02	41,55	3,16
91,15	35,93	15,91	26,04	41,84	3,14
92,54	35,94	15,24	26,27	40,77	3,12
93,86	35,85	15,04	25,74	40,67	3,11
95,21	35,78	15,35	25,53	40,20	3,09
96,38	35,71	15,11	26,12	39,89	3,08
97,55	35,69	15,00	26,17	41,23	3,06
98,72	35,64	15,15	26,41	40,52	3,04
99,82	35,54	14,69	26,35	40,48	3,03
100,83	35,47	14,88	25,41	40,55	3,02
101,89	35,40	14,42	26,73	40,84	3,00
102,85	35,29	14,64	26,22	41,55	2,99
103,85	35,29	14,74	26,98	41,37	2,97
104,79	35,37	15,07	25,64	40,02	2,95
105,66	35,53	15,91	26,90	40,07	2,93
106,54	35,64	15,91	26,39	41,01	2,90
107,47	35,72	15,69	26,04	41,07	2,88
108,33	35,86	15,94	26,69	43,08	2,86
109,12	36,03	15,70	26,27	39,85	2,84
109,91	36,05	15,66	26,48	41,33	2,81
110,66	35,99	15,84	25,66	40,56	2,79

111,49	36,01	16,02	26,12	40,46	2,77
112,22	36,16	15,90	26,16	41,01	2,75
112,85	36,25	15,55	25,73	40,70	2,73
113,53	36,27	15,84	25,75	40,11	2,71
114,15	36,25	15,84	26,19	40,49	2,69
114,76	36,22	16,02	26,33	41,93	2,67
115,24	36,26	15,98	26,36	41,43	2,65
115,79	36,26	15,76	27,65	41,67	2,62
116,32	36,29	15,91	25,89	40,86	2,60
116,89	36,26	16,02	27,14	42,61	2,58
117,30	36,32	15,96	26,15	41,51	2,56
117,76	36,34	15,81	26,54	41,78	2,54
118,22	36,42	16,16	24,78	41,00	2,52
118,52	36,43	15,81	25,66	40,59	2,49
118,91	36,49	16,30	26,93	41,14	2,47
119,36	36,64	16,33	26,02	40,12	2,45
119,63	36,74	16,17	27,44	42,02	2,43
120,03	36,90	16,61	27,52	40,55	2,40
120,33	36,96	16,13	25,79	40,55	2,38
120,76	37,02	16,39	27,19	41,05	2,36
121,04	37,12	16,35	26,21	40,23	2,33
121,33	37,19	15,79	26,46	40,78	2,31
121,62	37,17	16,37	25,89	41,36	2,29
121,95	37,18	16,38	26,41	41,19	2,27
122,31	37,15	16,03	26,95	40,83	2,25
122,55	37,13	16,21	26,31	40,27	2,23
122,89	37,15	16,11	26,39	42,06	2,21
123,19	37,18	16,36	26,23	41,31	2,18
123,50	37,23	16,28	25,65	41,93	2,16
123,89	37,22	16,35	26,23	40,63	2,14
124,17	37,23	16,54	26,41	40,49	2,12
124,42	37,26	16,36	26,63	40,31	2,10
124,73	37,38	16,14	26,43	41,60	2,08
125,15	37,48	16,52	26,80	40,89	2,05
125,56	37,52	16,25	26,41	40,09	2,03
125,83	37,41	16,40	26,53	41,35	2,01
126,15	37,54	16,83	25,99	41,08	1,99
126,57	37,61	16,63	26,11	40,47	1,96
126,89	37,57	16,70	25,73	41,10	1,94
127,23	37,57	16,57	26,13	40,54	1,92
127,71	37,59	16,47	26,94	41,43	1,90
128,08	37,68	16,59	26,98	42,36	1,88
128,48	37,78	16,74	25,84	40,55	1,85
128,94	37,77	16,57	26,12	40,53	1,83
129,40	37,84	16,38	25,56	40,13	1,81
129,76	37,84	16,43	26,15	40,98	1,79
130,14	37,94	16,41	26,59	40,64	1,77
130,63	38,03	16,19	26,53	41,26	1,74

131,11	38,14	16,58	27,11	40,81	1,72
131,57	38,20	16,52	25,84	40,13	1,70
132,09	38,29	16,39	26,29	40,91	1,68
132,59	38,39	16,97	25,78	40,32	1,66
133,16	38,39	16,55	25,91	40,69	1,64
133,72	38,35	16,76	26,47	40,32	1,62
134,28	38,34	16,78	25,40	40,72	1,60
134,91	38,30	16,97	25,59	40,92	1,57
135,48	38,28	16,83	25,61	41,13	1,55
136,20	38,35	16,47	26,15	41,54	1,53
136,82	38,34	16,34	26,97	42,29	1,51
137,50	38,44	16,58	25,99	39,59	1,49
138,19	38,41	16,24	26,13	40,75	1,47
138,94	38,44	16,56	26,70	40,07	1,45
139,74	38,45	16,53	26,32	40,97	1,43
140,43	38,44	16,13	25,62	40,22	1,41
141,17	38,50	16,22	26,00	42,01	1,39
141,95	38,46	16,26	26,57	40,99	1,37
142,64	38,44	16,34	27,09	41,98	1,35
143,48	38,41	16,37	26,43	40,52	1,33
144,28	38,33	16,13	25,94	41,49	1,32
144,98	38,30	16,42	26,25	40,99	1,30
145,83	38,25	16,42	26,39	40,84	1,28
146,55	38,19	16,17	25,58	39,45	1,26
147,39	38,14	16,26	26,13	41,31	1,24
148,15	38,07	16,13	25,82	40,58	1,23
148,93	38,05	16,00	27,41	40,82	1,21
149,71	38,02	15,81	26,11	40,63	1,20
150,38	38,08	15,72	25,29	39,66	1,18
151,21	38,04	15,58	26,04	40,64	1,17
151,95	37,91	15,60	27,16	40,46	1,15
152,71	37,83	15,51	26,39	41,05	1,14
153,39	37,82	15,41	26,63	41,68	1,12
154,14	37,82	15,74	26,48	40,64	1,11
154,93	37,86	15,80	27,04	41,47	1,09
155,64	37,77	15,66	26,64	39,78	1,08
156,39	37,74	15,29	25,69	40,55	1,07
157,10	37,62	15,77	27,58	41,37	1,05
157,78	37,58	15,68	25,98	40,32	1,04
158,59	37,55	15,28	26,13	41,06	1,02
159,29	37,55	15,70	26,11	40,88	1,01
160,01	37,58	15,35	26,23	39,54	0,99
160,78	37,58	15,31	25,53	41,56	0,98
161,56	37,58	15,30	26,21	40,63	0,96
162,21	37,59	15,28	26,40	40,59	0,95
162,95	37,43	15,49	26,39	40,88	0,94
163,67	37,30	15,28	25,67	40,29	0,92
164,48	37,24	15,40	26,12	41,54	0,91

165,19	37,20	15,37	26,41	41,57	0,89
165,92	37,19	15,18	25,95	41,23	0,88
166,64	37,18	15,36	26,42	40,66	0,87
167,34	37,18	15,23	26,02	40,38	0,86
168,02	37,16	15,16	26,62	40,39	0,84
168,70	37,13	15,19	26,13	40,71	0,83
169,48	37,13	14,94	27,27	41,14	0,82
170,10	37,04	15,21	25,67	41,63	0,80
170,87	36,92	14,99	27,01	41,18	0,79
171,49	36,87	14,71	27,22	40,88	0,78
172,21	36,91	14,83	26,49	40,55	0,77
172,92	36,80	15,07	26,25	40,63	0,76
173,61	36,78	14,92	26,74	41,19	0,75
174,34	36,72	14,90	27,67	41,93	0,74
175,02	36,63	15,14	26,14	40,67	0,73
175,79	36,56	14,75	26,26	39,98	0,72
176,53	36,56	14,77	26,63	41,06	0,71
177,21	36,43	14,73	25,79	40,69	0,70
177,96	36,36	14,64	26,32	40,00	0,69
178,69	36,32	14,47	25,48	40,60	0,69
179,50	36,31	14,46	26,77	40,85	0,68
180,30	36,24	14,45	25,83	40,95	0,67
180,98	36,21	14,32	26,11	40,62	0,66
181,81	36,08	14,30	26,67	41,17	0,66
182,48	35,92	14,25	26,11	40,50	0,65
183,17	39,04	19,41	26,57	42,07	2,88

CO-Lav - [100ppm]	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
-0,01	0,01	0,07
0,52	0,01	0,34
0,25	0,01	0,40
0,94	0,02	0,96
4,56	0,05	2,27
8,26	0,09	2,83
10,55	0,11	3,11
11,94	0,13	3,32
12,04	0,14	3,50
10,15	0,11	3,68
7,54	0,09	3,90
7,39	0,10	4,27
9,19	0,10	4,93
8,62	0,10	5,43
7,05	0,08	6,18
7,12	0,07	6,95
8,96	0,09	7,10
6,81	0,08	6,57
5,34	0,07	7,10
6,29	0,08	7,38
6,54	0,08	7,72
8,31	0,08	7,65
11,19	0,12	8,29
12,85	0,14	7,62
12,99	0,14	7,32
17,96	0,19	6,09
22,41	0,23	6,03
19,01	0,21	6,24
15,08	0,16	7,05
13,37	0,16	7,80
14,63	0,15	8,68
15,11	0,16	9,84
22,44	0,33	12,60
22,44	0,57	13,89
22,44	0,64	14,72
22,44	0,44	14,90
22,44	0,30	14,10
21,93	0,25	13,73
16,06	0,18	13,33
16,62	0,18	13,56
13,82	0,15	13,44
14,72	0,16	13,26
17,35	0,19	13,70

21,37	0,21	13,70
22,44	0,29	13,97
22,44	0,27	13,54
22,44	0,30	13,60
22,44	0,31	13,62
14,11	0,15	12,61
20,76	0,21	12,60
19,08	0,20	12,29
15,61	0,17	11,41
13,51	0,14	10,38
12,52	0,14	4,10
10,14	0,11	2,55
22,44	0,26	5,94
22,44	0,40	5,77
22,44	0,33	5,47
22,44	0,29	5,52
22,44	0,29	5,80
22,43	0,25	5,12
22,44	0,24	4,60
21,76	0,23	4,56
11,63	0,13	5,89
8,69	0,10	7,42
9,48	0,11	7,71
11,87	0,12	7,47
12,84	0,14	7,39
13,56	0,14	7,42
12,13	0,13	7,27
10,84	0,12	7,10
9,93	0,11	7,20
14,29	0,15	7,01
18,81	0,20	6,34
18,59	0,21	6,15
12,13	0,14	6,69
9,78	0,11	7,12
18,15	0,19	6,56
22,44	0,27	5,99
22,44	0,29	5,70
22,44	0,27	5,88
22,44	0,34	6,27
22,44	0,32	6,72
22,44	0,27	7,41
19,11	0,20	9,05
16,76	0,19	9,66
13,39	0,16	9,20
12,66	0,15	9,41
14,11	0,16	9,10
16,06	0,17	9,05
15,43	0,17	8,83

16,16	0,18	8,79
16,48	0,17	8,66
15,37	0,16	8,61
15,19	0,17	8,58
15,00	0,17	8,60
14,23	0,16	8,74
12,91	0,14	8,69
13,27	0,14	8,65
12,71	0,14	8,69
12,90	0,14	8,61
11,67	0,12	8,65
11,54	0,14	8,74
11,54	0,13	8,80
11,21	0,12	8,89
11,38	0,13	9,03
12,71	0,14	9,04
11,39	0,13	9,14
11,28	0,12	9,97
11,92	0,12	9,94
11,38	0,13	9,53
12,15	0,14	9,16
12,31	0,14	9,00
12,03	0,13	8,81
11,49	0,13	8,77
11,87	0,13	8,76
11,57	0,13	8,88
11,01	0,12	8,83
10,84	0,12	8,99
10,52	0,12	9,11
9,03	0,10	9,12
9,55	0,11	9,26
9,35	0,11	9,30
9,46	0,12	9,35
9,50	0,11	9,42
8,76	0,09	9,63
9,15	0,11	9,76
8,91	0,10	9,81
8,56	0,10	9,90
9,52	0,11	9,85
9,41	0,11	9,84
8,93	0,10	9,82
8,34	0,09	9,74
8,97	0,10	9,71
9,85	0,12	9,57
6,92	0,09	9,51
8,92	0,10	9,65
6,24	0,08	9,70
7,03	0,08	9,82

7,42	0,09	9,96
8,20	0,10	9,96
8,32	0,10	9,87
7,96	0,10	9,82
7,24	0,08	9,80
7,55	0,09	9,73
6,94	0,08	9,81
7,78	0,09	9,81
8,12	0,09	9,81
7,88	0,10	9,81
7,69	0,09	9,79
8,16	0,09	9,50
7,10	0,09	9,44
8,33	0,09	9,44
7,72	0,09	9,53
8,42	0,10	9,50
8,59	0,10	9,57
8,57	0,11	9,46
10,45	0,13	9,37
7,02	0,08	9,09
6,82	0,08	9,02
6,25	0,07	9,04
7,29	0,09	9,05
6,40	0,08	8,85
5,77	0,07	8,43
5,45	0,06	8,18
5,71	0,07	8,11
5,75	0,08	8,09
6,08	0,08	8,03
5,81	0,07	7,96
5,26	0,07	7,94
5,57	0,08	7,84
5,45	0,06	7,81
5,43	0,07	7,77
5,46	0,07	7,75
5,32	0,07	7,67
5,06	0,06	7,70
5,25	0,06	7,69
4,59	0,06	7,67
5,00	0,07	7,70
4,79	0,07	7,68
4,54	0,06	7,68
4,32	0,06	7,70
4,81	0,06	7,76
4,41	0,06	7,77
4,47	0,06	7,79
4,23	0,06	7,78
4,48	0,05	7,78

4,57	0,06	7,79
4,22	0,05	7,74
4,13	0,07	7,66
4,00	0,04	7,68
4,08	0,05	7,64
4,13	0,06	7,58
3,95	0,05	7,60
3,58	0,04	7,57
3,82	0,06	7,51
3,45	0,05	7,18
3,04	0,04	6,77
3,20	0,05	6,53
3,15	0,05	6,49
3,19	0,05	6,43
3,45	0,05	6,42
3,43	0,05	6,38
3,37	0,05	6,42
4,08	0,06	6,46
4,01	0,05	6,51
4,21	0,06	6,51
4,54	0,06	6,31
5,02	0,06	5,87
6,49	0,08	5,70
8,02	0,10	5,59
9,63	0,11	5,53
7,42	0,09	2,72

Annex 21

Title: MF logger data 060220

Pages total: 65, excl this cover page

Datotid	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C]	Filter-4-R - [°C]
		1	2	3	4
Time	Ambient	Main train	Split train 1H	Split train rem.	Room blank
	temperature	filter temp	filter temp	filter temp	filter temp
13:29:21	23,02	28,99	29,47	27,99	25,49
13:29:51	22,99	29,85	30,33	28,46	25,44
13:30:21	22,99	29,76	30,38	28,42	25,58
13:30:51	22,86	29,71	28,31	28,42	25,58
13:31:21	23,04	30,00	28,71	28,42	25,56
13:31:51	22,97	29,93	28,80	28,46	25,59
13:32:21	22,89	29,88	28,85	28,38	25,49
13:32:51	23,04	29,91	28,95	28,33	25,47
13:33:21	23,07	29,94	29,16	28,35	25,58
13:33:51	23,24	29,93	29,33	28,36	25,46
13:34:21	23,36	29,68	29,33	28,49	25,45
13:34:51	23,31	29,73	29,39	28,57	25,52
13:35:21	22,90	29,77	29,07	28,57	25,58
13:35:51	23,11	29,69	29,17	28,56	24,61
13:36:21	23,27	29,41	29,27	28,73	24,80
13:36:51	23,11	29,43	29,23	28,93	24,75
13:37:21	23,40	29,35	29,25	29,10	24,89
13:37:51	22,98	29,54	29,02	29,37	24,87
13:38:21	23,00	29,26	29,24	29,38	24,91
13:38:51	23,14	29,53	29,06	29,54	24,97
13:39:21	22,99	29,49	29,09	29,41	24,88
13:39:51	23,04	29,20	29,27	29,37	24,93
13:40:21	23,00	29,38	29,01	29,39	25,04
13:40:51	23,34	29,39	28,98	29,31	25,06
13:41:21	22,91	29,14	29,39	29,18	25,03
13:41:51	22,68	29,16	29,47	29,19	25,11
13:42:21	22,86	29,36	29,41	29,18	25,12
13:42:51	22,97	29,25	29,56	29,22	25,08
13:43:21	23,04	29,33	29,57	29,34	25,06
13:43:51	23,33	29,54	29,44	29,48	25,16
13:44:21	23,43	29,69	29,39	29,67	25,29
13:44:51	23,33	29,48	29,60	29,59	25,28
13:45:21	23,09	29,56	29,72	29,63	25,16
13:45:51	23,10	29,60	29,69	29,65	25,21
13:46:21	23,00	29,94	29,36	29,71	25,19
13:46:51	22,91	29,92	29,39	29,66	25,18
13:47:21	22,97	29,91	29,32	29,62	25,24
13:47:52	22,95	29,84	29,28	29,53	25,23
13:48:22	23,10	29,93	29,30	29,55	25,27
13:48:52	22,96	29,95	29,26	29,45	25,30
13:49:22	23,16	29,85	29,29	29,37	25,34
13:49:52	23,17	29,74	29,34	29,25	25,31
13:50:22	22,99	29,58	29,41	29,30	25,33

13:50:52	23,04	29,61	29,31	29,37	25,43
13:51:22	23,10	29,82	29,36	29,59	25,35
13:51:52	23,22	29,70	29,62	29,67	25,31
13:52:22	23,23	29,73	29,55	29,77	25,38
13:52:52	23,20	29,69	29,57	29,82	25,42
13:53:22	23,20	29,51	29,69	29,81	25,49
13:53:52	23,06	29,39	29,76	29,76	25,46
13:54:22	23,55	29,45	29,87	29,80	25,47
13:54:52	22,90	29,43	29,81	29,79	25,41
13:55:22	22,62	29,37	29,77	29,74	25,45
13:55:52	23,00	29,43	29,60	29,67	25,46
13:56:22	23,63	29,38	29,54	29,57	25,56
13:56:52	23,37	29,36	29,51	29,48	25,57
13:57:22	23,34	29,33	29,67	29,45	25,54
13:57:52	23,67	29,30	29,65	29,34	25,52
13:58:22	23,18	29,28	29,60	29,24	25,53
13:58:52	23,12	29,28	29,48	29,27	25,49
13:59:22	22,73	29,14	29,48	29,35	25,49
13:59:52	23,08	29,19	29,32	29,48	25,54
14:00:22	22,96	29,23	29,27	29,65	25,47
14:00:52	22,88	29,20	29,38	29,72	25,47
14:01:22	23,00	29,32	29,32	29,86	25,51
14:01:52	22,97	29,20	29,51	29,77	25,41
14:02:22	22,65	29,03	29,74	29,74	25,48
14:02:52	22,97	29,36	29,54	29,71	25,35
14:03:22	23,08	29,22	29,78	29,60	25,52
14:03:52	23,41	29,60	29,43	29,71	25,39
14:04:22	23,45	29,44	29,77	29,52	25,47
14:04:52	23,32	29,79	29,41	29,60	25,38
14:05:22	22,84	29,59	29,64	29,39	25,37
14:05:52	22,75	29,71	29,45	29,41	25,43
14:06:22	22,78	29,71	29,36	29,46	25,33
14:06:52	22,75	29,48	29,55	29,48	25,41
14:07:22	22,59	29,68	29,23	29,64	25,39
14:07:52	22,48	29,48	29,43	29,67	25,32
14:08:22	22,59	29,56	29,31	29,81	25,41
14:08:52	22,71	29,68	29,15	29,88	25,36
14:09:22	22,73	29,42	29,34	29,79	25,27
14:09:52	22,95	29,53	29,09	29,79	25,41
14:10:22	22,57	29,61	29,05	29,85	25,25
14:10:52	22,66	29,26	29,48	29,60	25,33
14:11:22	22,68	29,45	29,19	29,66	25,33
14:11:52	22,67	29,12	29,53	29,44	25,35
14:12:22	22,68	29,15	29,47	29,44	25,39
14:12:52	22,72	29,18	29,58	29,41	25,34
14:13:22	22,85	29,10	29,63	29,42	25,34
14:13:52	22,70	29,20	29,46	29,54	25,37
14:14:22	22,75	29,05	29,48	29,70	25,34

14:14:52	22,82	28,97	29,45	29,74	25,34
14:15:22	22,73	28,89	29,45	29,74	25,30
14:15:52	22,85	28,85	29,42	29,78	25,30
14:16:22	22,60	28,84	29,34	29,83	25,27
14:16:52	22,82	28,82	29,28	29,80	25,35
14:17:22	22,91	29,04	29,10	29,83	25,31
14:17:52	22,66	28,91	29,28	29,80	25,19
14:18:22	22,67	29,00	29,17	29,65	25,29
14:18:52	22,70	29,33	28,88	29,69	25,27
14:19:22	22,89	29,15	29,28	29,48	25,13
14:19:52	22,71	29,25	29,33	29,40	25,23
14:20:22	22,66	29,59	29,18	29,57	25,25
14:20:52	23,08	29,28	29,51	29,51	25,24
14:21:22	23,00	29,31	29,47	29,60	25,23
14:21:52	22,56	29,25	29,51	29,72	25,27
14:22:22	22,86	29,32	29,47	29,84	25,16
14:22:52	23,00	29,33	29,47	29,82	25,27
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16:52:54	21,82	28,30	21,85	28,07	22,78
16:53:24	21,72	28,46	21,81	28,18	22,86
16:53:54	22,06	28,54	21,66	28,15	22,89
16:54:24	21,96	28,52	21,77	28,03	22,81
16:54:54	21,82	28,65	21,91	28,05	22,91
16:55:24	21,98	28,82	21,76	28,09	22,86
16:55:54	21,96	28,69	21,87	27,98	22,91
16:56:24	21,99	28,83	21,90	28,05	22,87
16:56:54	21,82	28,81	21,94	28,07	22,88
16:57:24	21,94	28,80	21,90	28,12	22,88
16:57:54	21,77	28,53	21,88	27,98	22,76
16:58:24	21,64	28,53	22,02	28,06	22,83
16:58:54	21,87	28,60	21,67	28,18	22,77
16:59:24	22,02	28,49	21,72	28,17	22,83
16:59:54	22,12	28,50	21,73	28,24	22,88
17:00:24	22,07	28,41	21,78	28,21	22,92
17:00:54	21,69	28,42	21,90	28,24	22,79
17:01:24	21,82	28,51	21,94	28,22	22,78
17:01:54	21,89	28,54	21,68	28,15	22,82
17:02:24	21,96	28,62	21,71	28,11	22,85

17:02:54	21,84	28,67	21,75	28,09	22,86
17:03:24	21,83	28,73	21,84	28,11	22,82
17:03:54	21,90	28,66	21,69	28,02	22,83
17:04:24	21,59	28,71	21,74	28,01	22,86
17:04:54	21,82	28,78	21,77	28,06	22,86
17:05:24	21,62	28,66	21,79	28,00	22,79
17:05:54	21,56	28,69	21,86	28,01	22,77
17:06:24	21,78	28,52	21,74	27,94	22,77
17:06:54	21,71	28,43	21,63	27,98	22,82
17:07:24	21,86	28,41	21,58	28,03	22,87
17:07:54	21,81	28,38	21,66	28,09	22,88
17:08:24	21,81	28,38	21,81	28,16	22,85
17:08:54	22,33	28,39	21,82	28,13	22,89
17:09:24	21,99	28,54	21,65	28,18	22,83
17:09:54	21,98	28,64	21,86	28,17	22,89
17:10:24	21,78	28,77	21,60	28,20	22,82
17:10:54	21,86	28,74	21,79	28,12	22,82
17:11:24	21,90	28,74	21,69	28,13	22,84
17:11:54	21,90	28,68	21,72	28,07	22,83
17:12:24	21,93	28,72	21,68	28,07	22,90
17:12:54	21,82	28,73	21,78	28,07	22,80
17:13:24	21,85	28,55	21,81	27,95	22,77
17:13:54	21,85	28,69	21,55	28,04	22,90
17:14:24	21,80	28,69	21,58	28,04	22,84
17:14:54	21,81	28,39	21,84	27,89	22,83
17:15:24	21,78	28,54	21,62	28,00	22,84
17:15:54	21,56	28,30	21,71	27,94	22,82
17:16:24	21,79	28,23	21,63	27,94	22,80
17:16:54	21,95	28,36	21,58	28,03	22,78
17:17:24	21,87	28,53	21,54	28,08	22,89
17:17:54	21,56	28,71	21,56	28,19	22,83
17:18:24	21,85	28,60	21,78	28,07	22,76
17:18:54	21,91	28,73	21,62	28,12	22,83
17:19:25	22,04	28,85	21,57	28,20	22,91
17:19:55	21,89	28,82	21,67	28,19	22,81
17:20:25	21,51	28,66	21,74	28,07	22,87
17:20:55	21,63	28,82	21,59	28,18	22,79
17:21:25	21,66	28,53	21,64	27,98	22,77
17:21:55	21,73	28,58	21,51	28,02	22,79
17:22:25	21,80	28,61	21,58	28,05	22,79
17:22:55	21,68	28,55	21,57	28,04	22,77
17:23:25	21,74	28,49	21,65	28,05	22,89
17:23:55	21,84	28,45	21,58	27,99	22,89
17:24:25	21,98	28,29	21,79	27,87	22,89
17:24:55	21,96	28,37	21,81	27,91	22,91
17:25:25	21,83	28,49	21,76	27,93	22,85
17:25:55	22,01	28,54	21,77	27,92	22,77
17:26:25	21,81	28,56	21,69	27,94	22,79

17:26:55	21,88	28,75	21,61	28,08	22,74
17:27:25	21,74	28,75	21,59	28,11	22,86
17:27:55	21,74	28,77	21,48	28,16	22,72
17:28:25	21,86	28,59	21,76	28,01	22,83
17:28:55	21,92	28,70	21,54	28,12	22,73
17:29:25	21,74	28,52	21,72	28,02	22,77
17:29:55	21,70	28,66	21,59	28,15	22,86
17:30:25	21,66	28,46	21,58	28,00	22,74
17:30:55	21,76	28,36	21,75	27,97	22,85
17:31:25	21,61	28,48	21,52	28,05	22,75
17:31:55	21,65	28,27	21,69	27,92	22,71
17:32:25	21,78	28,34	21,53	27,91	22,72
17:32:55	21,89	28,53	21,45	27,95	22,82
17:33:25	21,70	28,61	21,54	27,94	22,73
17:33:55	21,87	28,49	21,78	27,82	22,85
17:34:25	21,69	28,78	21,56	27,99	22,79
17:34:55	21,80	28,57	21,76	27,90	22,74
17:35:25	21,93	28,62	21,58	27,96	22,80
17:35:55	21,63	28,75	21,51	28,11	22,77
17:36:25	21,81	28,65	21,71	28,08	22,77
17:36:55	21,82	28,59	21,58	28,02	22,89
17:37:25	21,79	28,66	21,64	28,16	22,76
17:37:55	21,74	28,41	21,76	28,00	22,72
17:38:25	21,65	28,56	21,58	28,14	22,73
17:38:55	21,61	28,37	21,54	28,02	22,72
17:39:25	21,66	28,21	21,59	27,94	22,78
17:39:55	21,77	28,20	21,57	27,91	22,78
17:40:25	21,31	28,23	21,60	27,85	22,71
17:40:55	21,34	28,35	21,61	27,83	22,70
17:41:25	21,40	28,57	21,62	27,90	22,74
17:41:55	21,39	28,65	21,42	27,90	22,78
17:42:25	21,61	28,62	21,54	27,83	22,83
17:42:55	21,58	28,57	21,59	27,77	22,76
17:43:25	21,67	28,67	21,71	27,90	22,78
17:43:55	21,54	28,74	21,60	28,01	22,83
17:44:29	21,66	28,70	21,69	28,07	22,77
17:44:59	21,57	28,49	21,80	27,97	22,76
17:45:29	21,36	28,52	21,81	28,08	22,76
17:45:59	21,36	28,27	21,62	27,94	22,69
17:46:29	21,34	28,22	21,59	27,95	22,70
17:46:59	21,37	28,30	21,47	28,05	22,68
17:47:29	21,47	28,25	21,54	28,00	22,75
17:48:05	21,41	28,38	21,47	28,02	22,74
17:48:37	21,52	28,57	21,49	28,08	22,72
17:49:07	21,50	28,73	21,63	28,08	22,76
17:49:37	21,43	28,69	21,61	27,95	22,74
17:50:07	21,46	28,64	21,71	27,91	22,73
17:50:37	21,43	28,69	21,61	27,94	22,70

17:51:07	21,58	28,60	21,62	27,84	22,69
17:51:37	21,42	28,53	21,57	27,79	22,67
17:52:07	21,26	28,46	21,57	27,73	22,70
17:52:37	21,39	28,44	21,49	27,75	22,73
17:53:07	21,37	28,37	21,50	27,78	22,73
17:53:37	21,69	28,27	21,65	27,83	22,71
17:54:07	21,47	28,21	21,65	27,87	22,65
17:54:37	21,79	28,33	21,61	28,05	22,73
17:55:07	21,34	28,30	21,45	27,99	22,67
17:55:37	21,44	28,39	21,69	28,06	22,74
17:56:07	21,58	28,51	21,46	28,03	22,74
17:56:37	21,63	28,56	21,74	28,06	22,65
17:57:07	21,66	28,61	21,75	28,07	22,72
17:57:37	21,42	28,76	21,56	28,13	22,61
17:58:07	21,26	28,56	21,62	27,96	22,71
17:58:37	21,27	28,68	21,42	28,03	22,74
17:59:07	21,42	28,55	21,58	27,93	22,74
17:59:37	21,36	28,40	21,71	27,83	22,59
18:00:07	21,35	28,38	21,74	27,82	22,60
18:00:37	21,45	28,49	21,38	27,91	22,67
18:01:07	21,56	28,44	21,41	27,86	22,66
18:01:37	21,60	28,28	21,59	27,79	22,72
18:02:07	21,64	28,29	21,54	27,82	22,71
18:02:37	21,43	28,25	21,73	27,84	22,65
18:03:07	21,61	28,34	21,79	27,89	22,63
18:03:37	21,57	28,45	21,61	27,95	22,67
18:04:07	21,61	28,56	21,62	28,00	22,61
18:04:37	21,71	28,61	21,64	28,00	22,63
18:05:07	21,49	28,67	21,52	28,03	22,65
18:05:37	21,29	28,67	21,45	28,03	22,64
18:06:07	21,28	28,63	21,50	28,02	22,60
18:06:37	21,60	28,57	21,51	27,98	22,70
18:07:07	21,52	28,52	21,50	27,96	22,58
18:07:37	21,39	28,34	21,64	27,86	22,65
18:08:07	21,46	28,41	21,47	27,92	22,72
18:08:37	21,70	28,31	21,47	27,81	22,70
18:09:07	21,73	28,23	21,75	27,79	22,63
18:09:37	21,45	28,20	21,65	27,79	22,69
18:10:07	21,73	28,27	21,44	27,83	22,78
18:10:37	21,79	28,33	21,53	27,79	22,67
18:11:07	21,59	28,32	21,70	27,72	22,73
18:11:37	21,71	28,50	21,49	27,81	22,70
18:12:07	21,84	28,50	21,77	27,81	22,70
18:12:37	21,73	28,48	21,74	27,83	22,66
18:13:07	21,70	28,51	21,64	27,84	22,67
18:13:37	21,64	28,47	21,52	27,80	22,73
18:14:07	21,75	28,24	21,51	27,67	22,74
18:14:37	21,61	27,96	21,65	27,47	22,73

18:15:07	21,53	27,78	21,65	27,35	22,73
18:15:37	21,49	27,58	21,73	27,18	22,69
18:16:07	21,52	27,39	21,65	27,35	22,66
18:16:37	21,58	27,23	21,68	27,39	22,67
18:17:07	21,48	27,53	21,61	27,47	22,63
18:17:37	21,43	27,33	21,63	27,31	22,68
18:18:07	21,16	27,22	21,61	27,28	22,64
18:18:37	21,33	27,12	21,59	27,33	22,61
18:19:07	21,32	27,22	21,64	27,30	22,61
18:19:37	21,27	27,44	21,62	27,48	22,63
18:20:07	21,36	27,59	21,64	27,48	22,67
18:20:37	21,27	27,87	21,57	27,43	22,67
18:21:07	21,22	27,93	21,61	27,53	22,67
18:21:37	21,30	28,23	21,63	27,56	22,67

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
16,37	17,95	26,90	26,63	23,51	8,25
16,44	17,86	26,98	26,66	23,57	6,77
16,34	17,91	26,91	26,69	23,50	6,77
16,32	17,91	26,92	26,67	23,51	6,74
16,32	17,90	26,93	26,67	23,52	6,73
16,38	17,93	26,96	26,72	23,53	6,69
16,48	17,87	26,98	26,70	23,59	6,71
16,52	17,84	26,98	26,66	23,59	6,72
16,44	17,96	26,96	26,70	23,58	6,72
16,50	17,89	26,97	26,68	23,57	6,73
16,58	17,92	26,98	26,66	23,60	6,71
16,61	17,99	26,99	26,70	23,65	6,70
16,54	18,10	26,99	26,74	23,56	6,71
16,55	18,09	27,01	26,76	23,57	6,70
16,56	18,08	27,01	26,71	23,62	6,70
16,65	18,01	26,99	26,71	23,59	6,71
16,59	18,08	26,97	26,69	23,60	6,70
16,72	18,07	27,07	26,72	23,66	6,70
16,62	18,08	27,04	26,77	23,60	6,70
16,50	18,10	27,03	26,75	23,63	6,71
16,56	17,97	27,06	26,72	23,64	6,69
16,54	17,96	27,02	26,73	23,60	6,71
16,46	18,05	26,99	26,76	23,61	6,70
16,58	18,09	27,05	26,77	23,70	6,69
16,67	18,07	27,08	26,79	23,66	6,70
16,62	18,09	27,05	26,80	23,63	6,67
16,66	18,12	27,04	26,78	23,62	6,70
16,73	18,08	27,04	26,74	23,64	6,67
16,78	18,01	27,02	26,72	23,66	6,69
16,67	18,09	27,03	26,77	23,67	6,66
16,67	18,19	27,07	26,84	23,68	6,68
16,66	18,18	27,06	26,80	23,69	6,66
16,82	18,07	27,08	26,80	23,67	6,66
16,78	18,07	27,07	26,78	23,66	6,66
16,79	18,05	27,06	26,78	23,63	6,64
16,75	18,05	27,08	26,75	23,68	6,67
16,80	18,06	27,12	26,81	23,70	6,68
16,78	18,05	27,11	26,80	23,69	6,67
16,80	18,08	27,08	26,80	23,69	6,67
16,75	18,14	27,06	26,82	23,67	6,63
16,71	18,12	27,08	26,79	23,70	6,72
16,74	18,12	27,05	26,82	23,68	6,73
16,86	18,14	27,12	26,83	23,72	6,72

16,79	18,23	27,11	26,86	23,69	6,72
16,86	18,21	27,11	26,83	23,69	6,72
16,85	18,19	27,11	26,81	23,68	6,71
16,81	18,22	27,09	26,78	23,72	6,72
16,76	18,29	27,07	26,80	23,72	6,70
16,84	18,36	27,10	26,87	23,72	6,69
16,87	18,38	27,10	26,82	23,71	6,69
16,88	18,38	27,09	26,79	23,69	6,69
16,94	18,36	27,12	26,81	23,65	6,68
16,91	18,41	27,11	26,86	23,62	6,67
16,92	18,43	27,10	26,86	23,63	6,70
16,92	18,51	27,11	26,85	23,66	6,68
16,92	18,52	27,11	26,84	23,66	6,67
16,89	18,49	27,09	26,85	23,62	6,69
16,88	18,46	27,08	26,86	23,61	6,67
16,87	18,47	27,11	26,86	23,61	6,65
16,87	18,43	27,09	26,87	23,57	6,65
16,93	18,41	27,13	26,88	23,58	6,74
16,92	18,43	27,12	26,90	23,61	6,76
16,99	18,33	27,15	26,84	23,62	6,75
16,92	18,38	27,15	26,88	23,61	6,72
16,86	18,44	27,13	26,83	23,59	6,72
16,93	18,38	27,11	26,87	23,56	6,74
16,80	18,42	27,09	26,85	23,54	6,71
16,92	18,31	27,12	26,81	23,61	6,72
16,83	18,46	27,12	26,89	23,57	6,72
16,94	18,38	27,14	26,83	23,63	6,72
16,88	18,43	27,12	26,87	23,58	6,70
16,92	18,35	27,13	26,84	23,57	6,71
16,89	18,33	27,13	26,85	23,60	6,70
16,82	18,40	27,12	26,88	23,53	6,68
16,90	18,32	27,15	26,87	23,55	6,69
16,83	18,38	27,10	26,87	23,53	6,67
16,90	18,38	27,12	26,89	23,57	6,69
16,95	18,32	27,18	26,88	23,61	6,68
16,90	18,41	27,14	26,89	23,55	6,68
16,92	18,33	27,17	26,86	23,56	6,68
16,97	18,25	27,14	26,82	23,55	6,68
16,84	18,36	27,14	26,90	23,49	6,70
16,95	18,24	27,16	26,84	23,57	6,66
16,84	18,32	27,12	26,88	23,50	6,65
16,88	18,32	27,15	26,90	23,56	6,66
16,87	18,32	27,19	26,92	23,56	6,66
16,81	18,34	27,16	26,93	23,54	6,67
16,82	18,27	27,17	26,91	23,51	6,66
16,77	18,27	27,18	26,88	23,53	6,66
16,75	18,27	27,15	26,92	23,49	6,63
16,70	18,30	27,16	26,92	23,51	6,66

16,68	18,29	27,14	26,91	23,47	6,64
16,70	18,25	27,15	26,88	23,51	6,64
16,72	18,24	27,15	26,88	23,47	6,64
16,81	18,23	27,17	26,89	23,54	6,63
16,78	18,27	27,15	26,91	23,48	6,63
16,75	18,29	27,16	26,93	23,49	6,62
16,89	18,16	27,18	26,87	23,54	6,61
16,74	18,26	27,16	26,91	23,49	6,60
16,73	18,27	27,18	26,94	23,46	6,61
16,86	18,15	27,16	26,87	23,52	6,61
16,73	18,27	27,15	26,91	23,42	6,75
16,65	18,27	27,14	26,90	23,45	6,76
16,63	18,29	27,16	26,91	23,46	6,74
16,68	18,30	27,17	26,92	23,50	6,75
16,68	18,33	27,19	26,95	23,49	6,75
16,85	18,22	27,19	26,89	23,52	6,73
16,73	18,32	27,17	26,92	23,48	6,71
16,71	18,33	27,19	26,95	23,46	6,74
16,82	18,21	27,16	26,87	23,48	6,72
16,79	18,19	27,16	26,85	23,47	6,70
16,69	18,26	27,15	26,88	23,41	6,69
16,69	18,23	27,17	26,90	23,43	6,69
16,76	18,24	27,19	26,94	23,43	6,69
16,79	18,25	27,20	26,93	23,42	6,68
16,85	18,17	27,17	26,88	23,46	6,66
16,72	18,28	27,20	26,93	23,40	6,67
16,84	18,16	27,17	26,88	23,42	6,69
16,70	18,27	27,18	26,95	23,32	6,67
16,79	18,17	27,20	26,90	23,39	6,67
16,70	18,20	27,18	26,93	23,35	6,68
16,65	18,23	27,14	26,96	23,30	6,73
16,60	18,22	27,16	26,94	23,32	6,72
16,68	18,08	27,15	26,87	23,40	6,72
16,58	18,21	27,19	26,94	23,31	6,74
16,72	18,09	27,19	26,92	23,40	6,72
16,61	18,18	27,19	26,95	23,31	6,71
16,63	18,15	27,16	26,90	23,33	6,72
16,64	18,11	27,21	26,90	23,37	6,71
16,58	18,15	27,18	26,91	23,33	6,73
16,52	18,18	27,19	26,95	23,24	6,72
16,56	18,13	27,16	26,92	23,26	6,72
16,59	18,09	27,15	26,89	23,29	6,72
16,61	18,05	27,15	26,87	23,31	6,72
16,56	18,13	27,15	26,90	23,26	6,70
16,51	18,21	27,19	26,93	23,21	6,68
16,58	18,12	27,20	26,92	23,25	6,71
16,65	18,07	27,17	26,89	23,31	6,70
16,66	18,07	27,21	26,90	23,33	6,70

16,58	18,14	27,18	26,93	23,22	6,70
16,55	18,15	27,17	26,89	23,26	6,69
16,52	18,18	27,16	26,94	23,14	6,69
16,50	18,17	27,16	26,93	23,13	6,67
16,52	18,17	27,14	26,92	23,11	6,67
16,50	18,17	27,13	26,92	23,08	6,67
16,48	18,16	27,16	26,93	23,08	6,68
16,54	18,11	27,11	26,90	23,09	6,69
16,64	18,05	27,11	26,83	23,22	6,66
16,59	18,08	27,14	26,86	23,11	6,66
16,55	18,11	27,13	26,90	23,08	6,68
16,61	18,03	27,13	26,86	23,14	6,69
16,64	18,05	27,14	26,86	23,15	6,67
16,64	18,05	27,15	26,86	23,14	6,66
16,59	18,11	27,17	26,91	23,11	6,67
16,55	18,14	27,17	26,94	23,05	6,68
16,63	18,05	27,14	26,86	23,12	6,67
16,53	18,13	27,15	26,91	22,99	6,67
16,63	18,03	27,13	26,85	23,05	6,67
16,50	18,13	27,15	26,89	22,92	6,69
16,57	18,05	27,13	26,87	22,95	6,66
16,53	18,08	27,12	26,90	22,86	6,70
16,65	17,98	27,10	26,83	22,99	6,68
16,48	18,09	27,13	26,89	22,85	6,70
16,52	18,06	27,11	26,88	22,84	6,70
16,64	17,92	27,09	26,83	22,92	6,69
16,65	17,97	27,09	26,80	22,90	6,67
16,64	17,93	27,10	26,81	22,91	6,67
16,63	17,92	27,10	26,81	22,86	6,68
16,65	17,91	27,10	26,80	22,88	6,67
16,60	17,95	27,09	26,82	22,79	6,68
16,59	17,94	27,07	26,81	22,80	6,67
16,64	17,94	27,07	26,79	22,79	6,72
16,51	18,05	27,04	26,82	22,69	6,70
16,57	17,90	27,07	26,77	22,77	6,68
16,43	18,02	27,00	26,80	22,67	6,69
16,49	17,98	27,02	26,77	22,63	6,70
16,43	17,99	27,00	26,76	22,61	6,70
16,49	17,93	27,03	26,75	22,66	6,69
16,44	18,01	26,99	26,76	22,59	6,69
16,46	17,97	27,01	26,76	22,59	6,67
16,49	17,91	27,00	26,72	22,68	6,70
16,48	17,94	27,01	26,71	22,64	6,67
16,42	18,02	26,98	26,72	22,57	6,68
16,48	18,01	26,99	26,77	22,56	6,69
16,52	17,99	26,99	26,74	22,59	6,67
16,50	18,00	26,98	26,76	22,55	6,69
16,51	18,02	26,98	26,75	22,56	6,67

16,54	17,97	26,98	26,73	22,61	6,67
16,56	17,95	27,00	26,72	22,63	6,67
16,55	17,96	26,96	26,70	22,63	6,68
16,39	18,02	26,92	26,71	22,49	6,69
16,39	18,00	26,89	26,68	22,49	6,66
16,46	17,98	26,89	26,71	22,49	6,68
16,49	17,92	26,92	26,66	22,60	6,67
16,54	17,87	26,92	26,64	22,58	6,66
16,46	17,96	26,89	26,67	22,46	6,66
16,46	17,92	26,89	26,67	22,52	6,67
16,46	17,91	26,91	26,65	22,52	6,68
16,57	17,79	26,94	26,65	22,58	6,68
16,47	17,89	26,89	26,64	22,48	6,67
16,47	17,82	26,88	26,64	22,45	6,68
16,45	17,76	26,85	26,58	22,49	6,68
16,40	17,84	26,83	26,61	22,40	6,67
16,45	17,78	26,85	26,57	22,50	6,67
16,51	17,73	26,89	26,56	22,51	6,66
16,51	17,73	26,86	26,59	22,48	6,67
16,41	17,84	26,84	26,61	22,36	6,67
16,42	17,81	26,86	26,56	22,41	6,68
16,52	17,72	26,88	26,56	22,51	6,66
16,50	17,71	26,81	26,51	22,48	6,68
16,45	17,71	26,82	26,51	22,44	6,68
16,48	17,67	26,82	26,51	22,44	6,66
16,41	17,72	26,82	26,53	22,36	6,67
16,40	17,78	26,80	26,57	22,35	6,68
16,43	17,71	26,78	26,54	22,38	6,67
16,44	17,68	26,82	26,51	22,38	6,66
16,39	17,77	26,81	26,55	22,32	6,67
16,41	17,75	26,77	26,52	22,30	6,65
16,45	17,63	26,75	26,43	22,34	6,68
16,41	17,59	26,73	26,45	22,32	6,67
16,39	17,64	26,73	26,46	22,33	6,67
16,32	17,71	26,73	26,48	22,24	6,67
16,33	17,67	26,75	26,49	22,27	6,68
16,36	17,68	26,73	26,49	22,24	6,66
16,39	17,66	26,74	26,47	22,29	6,68
16,41	17,56	26,68	26,40	22,30	6,67
16,41	17,57	26,70	26,37	22,29	6,67
16,41	17,55	26,70	26,38	22,30	6,67
16,39	17,55	26,71	26,40	22,29	6,66
16,40	17,56	26,71	26,40	22,27	6,65
16,40	17,57	26,70	26,38	22,30	6,68
16,31	17,63	26,69	26,40	22,23	6,68
16,22	17,63	26,67	26,42	22,14	6,66
16,30	17,53	26,62	26,34	22,21	6,67
16,24	17,60	26,67	26,37	22,14	6,66

16,26	17,61	26,64	26,39	22,13	6,66
16,34	17,49	26,64	26,32	22,22	6,65
16,28	17,55	26,66	26,34	22,19	6,67
16,22	17,56	26,64	26,34	22,12	6,66
16,14	17,54	26,59	26,34	22,03	6,68
16,21	17,48	26,59	26,32	22,07	6,67
16,25	17,46	26,58	26,33	22,08	6,67
16,28	17,46	26,59	26,32	22,10	6,67
16,21	17,51	26,59	26,31	22,08	6,67
16,12	17,51	26,57	26,32	22,01	6,65
16,26	17,35	26,55	26,24	22,09	6,67
16,26	17,37	26,54	26,25	22,09	6,66
16,26	17,37	26,57	26,22	22,11	6,66
16,28	17,36	26,58	26,27	22,08	6,67
16,23	17,43	26,54	26,26	22,06	6,68
16,13	17,39	26,55	26,25	21,97	6,67
16,21	17,33	26,50	26,20	22,05	6,67
16,19	17,33	26,53	26,19	22,03	6,68
16,11	17,37	26,51	26,16	22,03	6,68
16,08	17,37	26,53	26,19	22,05	6,67
16,02	17,42	26,51	26,19	22,00	6,67
15,90	17,41	26,48	26,20	21,89	6,69
16,03	17,31	26,46	26,17	21,98	6,68
16,03	17,34	26,45	26,17	22,00	6,67
16,02	17,38	26,48	26,16	21,96	6,69
16,10	17,31	26,47	26,16	22,00	6,67
16,10	17,27	26,43	26,12	21,97	6,67
16,08	17,26	26,42	26,12	21,95	6,67
15,96	17,37	26,41	26,12	21,86	6,69
16,05	17,32	26,41	26,13	21,90	6,67
16,07	17,31	26,39	26,11	21,92	6,69
16,03	17,35	26,41	26,13	21,88	6,68
16,02	17,28	26,38	26,09	21,92	6,68
16,07	17,28	26,38	26,10	21,89	6,68
15,99	17,34	26,35	26,12	21,78	6,67
15,98	17,38	26,36	26,13	21,77	6,69
16,02	17,38	26,34	26,11	21,80	6,67
15,97	17,39	26,34	26,12	21,75	6,68
16,03	17,28	26,32	26,06	21,81	6,69
16,11	17,22	26,28	26,01	21,89	6,68
16,03	17,31	26,30	26,03	21,80	6,67
16,03	17,30	26,33	26,04	21,79	6,68
16,02	17,34	26,30	26,06	21,79	6,67
16,06	17,20	26,26	25,99	21,81	6,66
15,99	17,31	26,26	26,01	21,75	6,66
16,01	17,29	26,27	25,98	21,76	6,68
15,97	17,35	26,27	26,00	21,71	6,67
15,98	17,34	26,25	26,03	21,69	6,68

16,11	17,23	26,24	25,97	21,81	6,68
16,05	17,23	26,19	25,93	21,75	6,69
15,96	17,31	26,24	25,99	21,67	6,68
16,01	17,27	26,19	25,96	21,66	6,67
16,08	17,22	26,17	25,93	21,74	6,69
16,12	17,19	26,19	25,92	21,78	6,70
16,09	17,17	26,17	25,89	21,77	6,65
16,06	17,19	26,17	25,88	21,77	6,69
16,02	17,26	26,17	25,91	21,72	6,67
15,98	17,30	26,16	25,91	21,67	6,67
16,00	17,32	26,15	25,91	21,66	6,70
16,02	17,33	26,16	25,90	21,68	6,68
16,05	17,28	26,15	25,88	21,69	6,68
16,10	17,18	26,13	25,85	21,74	6,66
16,12	17,18	26,10	25,80	21,73	6,66
16,06	17,29	26,11	25,85	21,65	6,68
16,03	17,28	26,12	25,86	21,67	6,66
16,13	17,20	26,13	25,83	21,74	6,68
15,98	17,27	26,04	25,84	21,58	6,69
16,04	17,24	26,06	25,85	21,63	6,68
16,04	17,24	26,05	25,82	21,61	6,67
16,06	17,26	26,07	25,82	21,62	6,66
16,03	17,29	26,03	25,79	21,60	6,71
16,03	17,24	26,07	25,77	21,63	6,69
16,00	17,20	26,01	25,76	21,62	6,70
16,05	17,18	26,02	25,76	21,64	6,68
16,06	17,19	26,03	25,75	21,66	6,67
16,09	17,15	26,03	25,75	21,68	6,68
16,05	17,21	26,01	25,78	21,59	6,68
15,99	17,24	26,00	25,77	21,56	6,68
16,05	17,10	25,99	25,72	21,66	6,67
15,97	17,17	25,95	25,73	21,53	6,67
15,97	17,12	25,95	25,71	21,55	6,67
15,97	17,09	25,96	25,70	21,59	6,68
15,95	17,01	25,97	25,68	21,62	6,69
15,97	16,94	25,97	25,68	21,64	6,69
15,76	16,98	25,88	25,66	21,53	6,69
15,79	16,92	25,90	25,68	21,51	6,68
15,75	16,87	25,89	25,60	21,56	6,69
15,65	16,91	25,91	25,63	21,52	6,66
15,57	16,96	25,90	25,66	21,47	6,68
15,50	16,95	25,85	25,64	21,45	6,69
15,42	16,94	25,82	25,64	21,42	6,69
15,38	16,92	25,79	25,61	21,39	6,69
15,37	16,92	25,80	25,63	21,40	6,71
15,38	16,87	25,79	25,60	21,47	6,68
15,43	16,79	25,81	25,56	21,52	6,67
15,36	16,74	25,78	25,51	21,48	6,69

15,35	16,72	25,75	25,49	21,51	6,67
15,30	16,73	25,75	25,47	21,48	6,69
15,21	16,81	25,75	25,51	21,41	6,68
15,22	16,77	25,77	25,48	21,48	6,69
15,25	16,65	25,71	25,44	21,49	6,68
15,23	16,62	25,71	25,43	21,49	6,68
15,21	16,61	25,72	25,43	21,48	6,68
15,18	16,63	25,71	25,40	21,48	6,69
15,07	16,61	25,69	25,42	21,44	6,68
14,98	16,63	25,68	25,44	21,35	6,68
14,97	16,53	25,68	25,44	21,38	6,69
15,04	16,47	25,65	25,39	21,41	6,69
14,91	16,51	25,66	25,43	21,36	6,66
14,90	16,35	25,63	25,39	21,38	6,68
14,88	16,39	25,63	25,40	21,36	6,66
14,84	16,41	25,65	25,41	21,29	6,68
14,91	16,30	25,62	25,38	21,38	6,67
14,90	16,26	25,57	25,32	21,37	6,69
14,82	16,37	25,59	25,34	21,30	6,69
14,95	16,31	25,61	25,32	21,39	6,67
14,97	16,32	25,59	25,30	21,37	6,70
14,94	16,35	25,56	25,27	21,32	6,66
14,88	16,46	25,57	25,33	21,25	6,68
14,99	16,40	25,55	25,30	21,29	6,68
15,12	16,39	25,54	25,27	21,32	6,68
15,11	16,36	25,52	25,22	21,28	6,68
15,14	16,42	25,49	25,20	21,31	6,67
15,12	16,51	25,53	25,26	21,25	6,66
15,21	16,47	25,51	25,21	21,31	6,67
15,22	16,58	25,49	25,23	21,23	6,66
15,22	16,50	25,45	25,20	21,21	6,67
15,31	16,47	25,42	25,15	21,30	6,66
15,31	16,54	25,46	25,15	21,29	6,66
15,33	16,55	25,44	25,16	21,29	6,68
15,34	16,61	25,46	25,15	21,24	6,69
15,40	16,57	25,42	25,14	21,27	6,66
15,35	16,57	25,39	25,11	21,23	6,66
15,29	16,66	25,39	25,17	21,16	6,67
15,39	16,59	25,38	25,16	21,21	6,66
15,43	16,65	25,34	25,13	21,20	6,66
15,48	16,57	25,34	25,08	21,25	6,66
15,38	16,62	25,33	25,10	21,17	6,66
15,38	16,65	25,33	25,13	21,15	6,68
15,43	16,67	25,32	25,12	21,16	6,68
15,51	16,61	25,29	25,06	21,23	6,66
15,42	16,73	25,34	25,09	21,14	6,68
15,53	16,61	25,32	25,06	21,23	6,66
15,49	16,66	25,29	25,05	21,16	6,68

15,51	16,70	25,26	25,06	21,18	6,67
15,55	16,62	25,27	25,03	21,21	6,67
15,44	16,74	25,25	25,05	21,13	6,66
15,50	16,66	25,26	25,03	21,16	6,67
15,58	16,63	25,23	25,00	21,25	6,70
15,53	16,62	25,26	24,98	21,23	6,68
15,49	16,66	25,24	24,98	21,20	6,66
15,50	16,63	25,22	24,96	21,17	6,67
15,44	16,75	25,23	25,00	21,10	6,64
15,60	16,62	25,20	24,97	21,21	6,68
15,53	16,75	25,20	24,98	21,15	6,67
15,50	16,77	25,20	24,99	21,13	6,66
15,44	16,76	25,18	24,98	21,06	6,68
15,45	16,74	25,15	24,96	21,05	6,68
15,56	16,68	25,16	24,96	21,12	6,68
15,61	16,67	25,14	24,93	21,18	6,65
15,61	16,74	25,14	24,92	21,17	6,63
15,60	16,75	25,19	24,94	21,16	6,72
15,59	16,82	25,16	24,99	21,15	6,69
15,64	16,77	25,10	24,90	21,16	6,69
15,62	16,79	25,12	24,87	21,08	6,70
15,69	16,77	25,10	24,85	21,17	6,69
15,59	16,89	25,14	24,92	21,06	6,70
15,67	16,78	25,12	24,89	21,15	6,71
15,66	16,85	25,14	24,88	21,13	6,69
15,73	16,79	25,11	24,87	21,19	6,70
15,61	16,84	25,12	24,88	21,08	6,69
15,68	16,74	25,05	24,83	21,13	6,68
15,67	16,74	25,08	24,81	21,15	6,69
15,64	16,82	25,09	24,85	21,11	6,70
15,67	16,81	25,06	24,86	21,12	6,71
15,73	16,76	25,07	24,83	21,18	6,71
15,72	16,83	25,07	24,86	21,12	6,69
15,74	16,77	25,06	24,83	21,16	6,68
15,72	16,81	25,05	24,83	21,12	6,68
15,77	16,80	25,03	24,81	21,15	6,69
15,62	16,85	25,03	24,83	21,02	6,70
15,64	16,82	24,99	24,82	21,08	6,69
15,77	16,73	25,03	24,78	21,32	6,69
15,75	16,81	25,00	24,83	21,08	6,71
15,80	16,78	25,03	24,79	21,20	6,70
15,77	16,82	25,04	24,77	21,15	6,69
15,76	16,84	25,03	24,76	21,13	6,69
15,75	16,89	25,00	24,79	21,09	6,70
15,76	16,78	25,01	24,76	21,12	6,69
15,75	16,78	24,99	24,74	21,13	6,69
15,75	16,80	25,00	24,75	21,12	6,69
15,74	16,83	24,97	24,78	21,09	6,70

15,74	16,83	25,00	24,80	21,09	6,71
15,76	16,85	25,00	24,77	21,08	6,70
15,79	16,83	24,96	24,72	21,11	6,70
15,80	16,87	25,00	24,79	21,10	6,70
15,78	16,87	24,97	24,73	21,09	6,69
15,75	16,83	24,99	24,74	21,11	6,71
15,78	16,83	24,96	24,73	21,09	6,68
15,76	16,86	24,95	24,71	21,09	6,70
15,80	16,89	24,97	24,77	21,07	6,70
15,78	16,90	24,93	24,71	21,06	6,70
15,76	16,92	24,94	24,74	21,02	6,70
15,82	16,89	24,95	24,75	21,07	6,69
15,79	16,93	24,96	24,73	21,07	6,68
15,86	16,88	24,96	24,73	21,09	6,68
15,79	16,92	24,95	24,77	21,03	6,71
15,78	16,86	24,92	24,70	21,12	6,70
15,78	16,90	24,93	24,69	21,08	6,70
15,77	16,84	24,92	24,71	21,11	6,67
15,79	16,85	24,94	24,67	21,10	6,68
15,74	16,92	24,94	24,71	21,02	6,69
15,82	16,81	24,94	24,69	21,12	6,68
15,85	16,81	24,91	24,66	21,14	6,70
15,75	16,93	24,93	24,72	21,03	6,69
15,81	16,85	24,93	24,70	21,11	6,69
15,75	16,85	24,88	24,66	21,07	6,69
15,70	16,85	24,90	24,70	21,00	6,69
15,74	16,82	24,86	24,69	21,02	6,72
15,75	16,79	24,87	24,65	21,03	6,70
15,82	16,77	24,87	24,63	21,11	6,70
15,73	16,88	24,90	24,67	21,02	6,69
15,74	16,79	24,88	24,67	21,05	6,69
15,81	16,77	24,88	24,64	21,15	6,70
15,81	16,80	24,90	24,66	21,12	6,70
15,72	16,89	24,90	24,70	21,05	6,69
15,82	16,77	24,89	24,65	21,15	6,71
15,70	16,86	24,90	24,66	21,00	6,68
15,71	16,77	24,85	24,62	21,06	6,69
15,75	16,79	24,83	24,59	21,07	6,69
15,75	16,79	24,83	24,62	21,09	6,69
15,76	16,81	24,85	24,63	21,08	6,71
15,79	16,81	24,85	24,61	21,10	6,72
15,73	16,88	24,86	24,66	21,05	6,69
15,73	16,87	24,84	24,67	21,06	6,70
15,74	16,85	24,86	24,68	21,04	6,69
15,73	16,88	24,88	24,68	21,04	6,69
15,69	16,84	24,83	24,64	21,01	6,70
15,72	16,76	24,81	24,56	21,04	6,71
15,72	16,76	24,79	24,59	21,04	6,68

15,71	16,72	24,81	24,57	21,09	6,70
15,64	16,83	24,82	24,62	21,01	6,69
15,71	16,73	24,82	24,58	21,07	6,68
15,66	16,83	24,82	24,61	21,03	6,71
15,73	16,74	24,81	24,58	21,10	6,69
15,68	16,80	24,86	24,61	21,05	6,69
15,67	16,84	24,85	24,63	21,02	6,69
15,74	16,75	24,84	24,59	21,08	6,70
15,65	16,83	24,80	24,58	20,99	6,69
15,67	16,74	24,79	24,56	21,00	6,69
15,74	16,66	24,77	24,54	21,06	6,68
15,72	16,70	24,78	24,52	21,08	6,68
15,64	16,80	24,81	24,57	20,98	6,69
15,71	16,70	24,79	24,53	21,08	6,70
15,62	16,82	24,79	24,58	20,98	6,71
15,62	16,77	24,81	24,59	20,99	6,69
15,74	16,70	24,79	24,57	21,09	6,70
15,70	16,76	24,80	24,57	21,07	6,71
15,67	16,76	24,83	24,58	21,02	6,68
15,74	16,71	24,77	24,55	21,08	6,71
15,61	16,83	24,82	24,60	20,97	6,70
15,72	16,67	24,78	24,52	21,08	6,69
15,64	16,71	24,79	24,53	21,00	6,69
15,59	16,71	24,76	24,55	20,98	6,69
15,60	16,74	24,78	24,55	20,96	6,68
15,58	16,77	24,76	24,57	20,95	6,69
15,56	16,75	24,77	24,57	20,96	6,69
15,61	16,70	24,78	24,54	21,01	6,69
15,63	16,67	24,78	24,50	21,06	6,71
15,60	16,70	24,77	24,56	21,01	6,71
15,59	16,75	24,77	24,57	20,98	6,68
15,64	16,74	24,75	24,54	21,01	6,69
15,67	16,69	24,75	24,50	21,05	6,69
15,65	16,72	24,75	24,51	21,03	6,70
15,60	16,81	24,77	24,56	20,97	6,68
15,64	16,75	24,74	24,53	21,00	6,55
15,55	16,78	24,72	24,54	20,94	6,55
15,58	16,78	24,73	24,52	20,99	6,54
15,63	16,75	24,72	24,48	21,02	6,56
15,61	16,77	24,75	24,52	21,01	6,56
15,65	16,78	24,73	24,49	21,02	6,56
15,66	16,77	24,73	24,51	21,00	6,55
15,68	16,78	24,74	24,48	21,01	6,55
15,66	16,80	24,73	24,51	20,99	6,56
15,67	16,84	24,74	24,49	20,98	6,54
15,69	16,80	24,75	24,50	21,00	6,55
15,64	16,81	24,74	24,49	20,96	6,55
15,62	16,77	24,73	24,50	20,96	6,55

15,60	16,77	24,70	24,47	20,94	6,55
15,60	16,77	24,70	24,45	20,99	6,55
15,60	16,77	24,70	24,49	20,94	6,54
15,60	16,81	24,70	24,51	20,95	6,54
15,59	16,82	24,69	24,53	20,95	6,54
15,65	16,76	24,67	24,44	20,99	6,54
15,63	16,75	24,70	24,47	20,96	6,55
15,65	16,79	24,67	24,47	20,98	6,56
15,65	16,75	24,71	24,49	20,97	6,54
15,65	16,82	24,67	24,46	20,96	6,55
15,64	16,82	24,68	24,47	20,97	6,54
15,70	16,73	24,69	24,44	21,03	6,55
15,61	16,83	24,70	24,50	20,94	6,54
15,71	16,71	24,67	24,44	21,04	6,54
15,62	16,80	24,67	24,47	20,92	6,54
15,56	16,84	24,67	24,47	20,90	6,55
15,54	16,83	24,65	24,45	20,91	6,53
15,68	16,70	24,66	24,43	21,02	6,53
15,70	16,73	24,65	24,40	21,02	6,55
15,61	16,80	24,66	24,43	20,97	6,56
15,62	16,78	24,66	24,46	20,94	6,55
15,59	16,80	24,64	24,43	20,92	6,56
15,59	16,80	24,64	24,43	20,94	6,54
15,62	16,75	24,64	24,42	20,98	6,55
15,67	16,75	24,67	24,45	20,97	6,55
15,66	16,79	24,66	24,47	20,94	6,52
15,71	16,75	24,68	24,44	21,01	6,54
15,68	16,78	24,68	24,44	21,03	6,55
15,68	16,78	24,68	24,47	21,02	6,54
15,65	16,75	24,64	24,44	20,99	6,54
15,67	16,73	24,65	24,41	21,00	6,54
15,56	16,82	24,61	24,41	20,91	6,54
15,65	16,72	24,63	24,38	21,01	6,56
15,64	16,79	24,60	24,43	20,91	6,53
15,56	16,87	24,59	24,43	20,87	6,56
15,58	16,82	24,60	24,39	20,93	6,54
15,67	16,77	24,60	24,37	20,99	6,56
15,68	16,79	24,61	24,40	20,94	6,54
15,57	16,90	24,60	24,43	20,88	6,56
15,67	16,82	24,61	24,39	20,94	6,54
15,63	16,88	24,58	24,42	20,88	6,55
15,62	16,85	24,53	24,40	20,93	6,52
15,67	16,84	24,58	24,38	20,95	6,54
15,70	16,80	24,64	24,38	20,98	6,60
15,69	16,81	24,62	24,41	20,96	6,54
15,65	16,87	24,58	24,40	20,95	6,54
15,68	16,83	24,60	24,37	20,96	6,54
15,67	16,85	24,59	24,40	20,94	6,57

15,64	16,85	24,58	24,40	20,94	6,52
15,65	16,84	24,62	24,43	20,94	6,53
15,70	16,80	24,61	24,38	20,99	6,56
15,66	16,86	24,59	24,40	20,94	6,55
15,67	16,79	24,58	24,36	20,98	6,54
15,68	16,82	24,61	24,38	20,95	6,52
15,66	16,82	24,57	24,34	20,91	6,53
15,67	16,77	24,60	24,37	20,93	6,54
15,68	16,77	24,57	24,31	20,93	6,55
15,66	16,80	24,54	24,31	20,92	6,53
15,63	16,83	24,54	24,33	20,92	6,55
15,64	16,83	24,56	24,36	20,92	6,54
15,67	16,82	24,58	24,35	20,91	6,53
15,69	16,80	24,59	24,35	20,94	6,54

Flow-D - [ln/min]	NS-Røgtemp - [°C]	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
7,58	168,72	275,06	233,09	227,38	253,18
7,55	157,50	268,00	233,65	227,22	252,20
6,73	166,09	263,29	234,32	227,33	250,84
6,69	179,22	262,88	234,92	227,12	249,53
6,68	187,63	264,90	235,36	226,82	248,51
6,65	185,88	269,95	235,57	226,29	247,58
6,67	159,81	274,58	235,57	225,69	246,89
6,76	152,21	277,77	235,46	225,34	246,53
6,76	150,18	280,37	235,08	224,69	246,22
6,77	148,95	283,26	234,60	223,96	246,03
6,76	148,40	286,40	233,92	223,36	245,78
6,77	148,50	289,20	233,26	222,70	245,69
6,76	148,18	292,30	232,36	221,86	245,45
6,74	147,87	295,21	231,44	221,01	245,39
6,75	147,20	298,13	230,38	220,30	245,29
6,75	147,41	301,22	229,38	219,32	245,26
6,76	147,55	303,90	228,18	218,50	245,21
6,75	147,25	306,49	226,97	217,49	245,17
6,75	146,23	308,79	225,74	216,56	245,29
6,75	146,05	311,67	224,60	215,75	245,30
6,74	145,17	313,98	223,34	214,85	245,36
6,76	145,32	315,98	222,02	213,86	245,44
6,77	145,60	318,24	220,75	213,11	245,44
6,75	145,64	320,09	219,46	212,25	245,36
6,76	145,23	321,75	218,24	211,37	245,56
6,74	145,23	323,39	216,96	210,49	245,46
6,78	144,61	325,04	215,70	209,71	245,46
6,75	144,37	326,20	214,44	208,90	245,43
6,76	143,95	327,76	213,22	208,21	245,34
6,75	144,61	329,03	212,02	207,56	245,37
6,73	143,96	330,42	210,80	206,75	245,24
6,75	143,96	331,43	209,68	206,03	245,28
6,78	143,33	332,43	208,56	205,26	245,28
6,73	143,75	333,66	207,48	204,70	245,31
6,74	143,87	334,65	206,38	204,14	245,27
6,76	143,81	335,67	205,28	203,55	245,17
6,75	144,14	336,61	204,24	202,95	245,21
6,73	143,59	337,55	203,24	202,34	245,10
6,75	144,49	338,98	202,26	201,90	245,15
6,74	145,20	340,32	201,30	201,44	245,13
6,72	145,86	342,61	200,35	201,13	245,05
6,75	146,95	345,00	199,40	200,74	245,16
6,72	147,88	347,62	198,49	200,41	245,35

6,74	148,48	350,08	197,60	200,17	245,62
6,72	149,42	353,19	196,79	200,15	246,02
6,72	148,88	355,58	195,99	200,04	246,41
6,73	149,53	357,99	195,24	199,95	246,83
6,73	150,86	360,50	194,46	199,90	247,39
6,71	151,65	363,24	193,76	199,90	247,89
6,71	151,75	365,85	193,08	199,96	248,38
6,72	150,85	368,38	192,43	200,15	249,05
6,72	151,95	370,46	191,85	200,22	249,59
6,70	152,10	372,00	191,25	200,45	250,23
6,67	152,49	373,95	190,70	200,63	250,91
6,68	152,57	375,12	190,11	200,81	251,46
6,70	152,64	376,12	189,60	201,01	252,05
6,67	152,36	377,51	189,16	201,29	252,71
6,71	152,71	378,72	188,72	201,53	253,28
6,67	152,57	379,94	188,28	201,74	253,89
6,68	153,59	380,88	187,87	201,97	254,23
6,64	153,03	381,63	187,49	202,16	254,84
6,66	152,44	382,47	187,09	202,46	255,36
6,65	152,88	383,30	186,80	202,78	255,90
6,63	152,79	383,99	186,49	203,01	256,27
6,62	152,69	384,24	186,24	203,26	256,76
6,64	153,35	384,90	185,94	203,45	257,34
6,62	154,17	385,29	185,70	203,85	257,76
6,61	153,70	385,51	185,50	204,12	258,39
6,61	153,08	385,97	185,26	204,48	258,92
6,59	153,21	386,64	185,08	204,75	259,61
6,60	152,91	386,84	184,89	205,07	260,18
6,59	153,34	387,39	184,75	205,47	260,84
6,61	153,07	387,55	184,67	205,85	261,40
6,58	152,59	387,95	184,58	206,30	262,01
6,56	153,90	387,95	184,51	206,52	262,58
6,58	152,47	388,72	184,36	206,84	263,11
6,59	151,41	389,11	184,36	207,17	263,69
6,57	151,72	389,26	184,33	207,62	264,26
6,56	151,54	389,55	184,30	208,11	264,83
6,55	152,24	389,56	184,37	208,53	265,37
6,78	151,55	389,99	184,40	208,78	265,77
6,79	152,26	390,05	184,38	209,10	266,28
6,77	151,00	390,65	184,47	209,34	266,74
6,76	151,10	390,61	184,47	209,86	266,96
6,78	150,18	391,10	184,56	210,36	267,36
6,77	151,35	391,10	184,67	210,68	267,66
6,77	150,47	391,74	184,76	211,08	268,00
6,75	151,08	392,16	184,97	211,42	268,50
6,75	150,41	392,58	185,06	211,86	268,77
6,76	150,45	392,91	185,23	212,26	269,12
6,74	149,80	393,53	185,38	212,67	269,42

6,73	150,51	394,13	185,58	213,03	269,75
6,74	150,10	394,43	185,77	213,32	270,03
6,74	149,89	395,28	185,96	213,74	270,47
6,72	150,54	395,57	186,15	214,09	270,83
6,73	150,23	396,05	186,38	214,61	271,15
6,72	149,69	396,15	186,65	215,02	271,52
6,70	150,16	396,46	186,87	215,48	271,86
6,72	149,57	396,75	187,14	215,95	272,25
6,71	149,19	396,82	187,39	216,38	272,61
6,68	149,23	397,55	187,67	216,68	273,02
6,69	149,27	398,38	187,97	217,09	273,37
6,71	149,16	398,99	188,22	217,33	273,61
6,68	149,00	399,74	188,57	217,74	274,04
6,69	148,93	400,86	188,86	218,07	274,41
6,69	148,44	401,90	189,22	218,35	274,92
6,66	150,46	403,21	189,55	218,65	275,38
6,67	150,59	404,36	189,92	219,09	275,90
6,66	150,37	406,01	190,31	219,47	276,53
6,64	150,00	407,60	190,69	219,77	277,12
6,65	148,93	408,47	191,06	220,12	277,61
6,66	149,70	409,25	191,39	220,48	278,12
6,64	148,99	409,63	191,79	220,73	278,67
6,63	148,81	409,79	192,15	221,12	279,26
6,64	148,07	409,88	192,49	221,48	279,72
6,64	148,30	410,25	192,82	221,80	280,10
6,62	148,38	410,11	193,24	222,11	280,48
6,62	147,82	409,86	193,65	222,47	280,96
6,74	147,79	409,69	194,02	222,87	281,15
6,73	147,53	409,02	194,44	223,17	281,68
6,72	147,01	408,27	194,82	223,54	281,93
6,73	146,45	407,72	195,17	223,77	282,38
6,70	145,72	406,69	195,59	223,99	282,62
6,74	145,12	405,52	195,93	224,31	282,92
6,73	144,38	404,11	196,27	224,68	283,24
6,74	143,30	402,94	196,70	224,88	283,53
6,72	142,16	401,63	197,07	225,28	283,68
6,71	141,78	400,38	197,46	225,57	283,84
6,69	141,17	398,69	197,85	225,84	283,94
6,70	140,58	397,00	198,23	226,18	284,07
6,69	139,54	394,73	198,58	226,41	283,90
6,70	138,24	393,13	198,96	226,69	283,94
6,67	138,39	391,08	199,33	226,89	283,91
6,68	136,88	389,05	199,69	227,08	283,76
6,83	136,37	386,96	200,00	227,25	283,37
6,81	135,96	385,02	200,43	227,44	283,21
6,80	134,21	383,20	200,80	227,48	282,93
6,79	133,37	381,44	201,15	227,81	282,61
6,78	133,36	379,31	201,52	228,11	282,27

6,78	133,32	377,67	201,92	228,36	282,11
6,75	133,44	376,14	202,29	228,61	281,72
6,76	132,98	375,37	202,67	228,78	281,50
6,76	131,80	374,29	203,04	228,86	281,21
6,74	130,41	372,89	203,42	229,14	280,91
6,73	130,34	371,26	203,79	229,39	280,73
6,74	129,51	369,74	204,16	229,61	280,50
6,72	127,37	367,35	204,52	229,64	280,05
6,74	126,32	365,11	204,86	229,71	279,63
6,72	124,59	362,02	205,25	229,91	279,13
6,71	123,87	359,28	205,60	229,93	278,60
6,71	123,37	356,39	205,98	229,81	277,93
6,71	122,88	353,54	206,37	229,65	277,32
6,70	121,74	350,40	206,76	229,53	276,58
6,70	120,96	347,61	207,24	229,33	275,78
6,73	120,03	344,80	207,65	229,15	274,96
6,71	118,54	341,73	208,09	229,07	274,04
6,70	118,30	338,91	208,55	228,98	273,06
6,70	116,95	336,19	209,02	228,81	272,13
6,69	116,41	333,36	209,44	228,75	271,16
6,70	115,56	330,54	209,90	228,61	270,02
6,71	115,10	328,27	210,31	228,39	269,18
6,72	114,35	325,62	210,80	227,94	268,13
6,69	113,94	323,46	211,21	227,60	267,14
6,71	112,81	321,10	211,61	227,45	266,16
6,70	112,06	318,88	212,01	227,19	265,15
6,72	111,18	316,88	212,37	226,92	264,15
6,71	111,48	314,72	212,74	226,71	263,07
6,72	110,88	312,74	213,15	226,61	262,28
6,69	109,92	310,60	213,41	226,33	261,36
6,70	109,47	308,54	213,75	226,07	260,45
6,69	108,72	306,43	214,03	225,84	259,49
6,71	107,60	304,51	214,34	225,54	258,68
6,71	107,20	302,64	214,47	225,39	257,69
6,71	106,98	300,56	214,82	225,07	256,76
6,69	105,91	298,87	215,05	224,74	255,95
6,70	105,50	296,98	215,34	224,33	255,28
6,69	105,07	295,41	215,51	223,94	254,41
6,69	104,27	293,86	215,78	223,71	253,67
6,67	103,88	292,15	215,99	223,48	252,87
6,68	103,44	290,59	216,20	223,17	252,10
6,69	101,90	289,26	216,41	222,84	251,28
6,68	102,53	287,70	216,61	222,63	250,51
6,68	102,33	286,56	216,79	222,31	249,83
6,67	101,50	285,42	216,95	222,01	249,13
6,68	100,58	284,02	217,18	221,61	248,45
6,69	99,66	282,75	217,33	221,29	247,72
6,68	98,98	281,11	217,43	221,08	247,06

6,68	98,00	279,83	217,62	220,80	246,38
6,66	97,77	278,47	217,74	220,35	245,74
6,66	97,97	277,18	217,79	220,11	245,14
6,67	97,71	275,48	217,80	219,70	244,40
6,67	97,28	274,37	217,80	219,23	243,74
6,69	96,89	273,13	217,73	218,85	243,10
6,66	96,36	271,71	217,65	218,58	242,40
6,67	96,09	270,49	217,58	218,03	241,53
6,65	95,17	269,35	217,51	217,71	241,02
6,69	94,50	268,07	217,45	217,27	240,34
6,66	94,33	267,04	217,31	216,96	239,77
6,69	94,02	265,85	217,20	216,55	239,07
6,66	93,32	264,54	217,10	216,17	238,46
6,66	92,57	263,41	216,95	215,73	237,87
6,68	92,93	262,21	216,81	215,37	237,20
6,66	92,07	261,50	216,65	214,83	236,60
6,66	91,71	260,32	216,54	214,50	236,00
6,67	90,79	259,17	216,36	213,86	235,41
6,66	89,57	257,60	216,17	213,43	234,80
6,66	89,41	255,65	215,97	213,00	234,12
6,67	89,24	253,51	215,76	212,45	233,43
6,65	88,84	251,45	215,53	211,79	232,72
6,66	87,48	249,84	215,27	211,15	231,91
6,65	86,81	247,81	215,00	210,46	231,11
6,67	86,41	245,75	214,73	209,66	230,31
6,65	85,77	243,60	214,48	208,89	229,44
6,65	85,21	241,58	214,12	208,13	228,47
6,65	85,18	239,50	213,82	207,39	227,62
6,65	84,34	237,69	213,47	206,51	226,68
6,67	83,98	235,90	213,14	205,69	225,70
6,66	83,00	234,09	212,78	204,96	224,71
6,66	82,45	232,16	212,43	204,12	223,79
6,66	82,56	230,34	212,09	203,26	222,83
6,65	81,29	228,60	211,73	202,51	221,87
6,65	81,31	226,93	211,37	201,66	220,87
6,65	80,64	225,17	211,00	200,74	219,96
6,65	81,02	223,43	210,64	199,87	218,94
6,66	80,39	221,91	210,24	198,97	217,98
6,66	79,61	220,26	209,87	198,19	217,06
6,67	79,36	218,78	209,45	197,39	216,04
6,66	78,77	217,26	209,04	196,53	215,07
6,67	78,49	215,75	208,65	195,70	214,11
6,64	78,03	214,07	208,28	194,90	213,27
6,64	77,70	212,64	207,87	194,01	212,31
6,67	77,37	211,39	207,47	193,30	211,34
6,65	76,53	210,10	207,06	192,46	210,43
6,67	76,59	208,98	206,66	191,61	209,58
6,67	76,39	207,50	206,27	190,97	208,66

6,66	75,17	206,16	205,81	190,28	207,83
6,66	75,44	205,02	205,42	189,55	207,00
6,65	74,85	203,75	205,07	188,85	206,15
6,67	74,66	202,48	204,62	188,19	205,34
6,66	74,40	201,41	204,20	187,36	204,51
6,67	73,82	200,14	203,82	186,55	203,75
6,66	73,65	199,15	203,45	185,73	203,00
6,68	73,23	197,96	203,04	184,94	202,26
6,65	73,32	196,98	202,58	184,27	201,41
6,66	72,82	196,02	202,18	183,59	200,63
6,65	72,44	194,94	201,74	182,84	199,86
6,65	72,32	193,97	201,38	182,14	199,18
6,66	71,75	192,89	200,99	181,45	198,45
6,66	71,37	191,92	200,53	180,76	197,70
6,66	70,93	190,92	200,11	180,25	197,05
6,66	70,83	190,11	199,69	179,69	196,37
6,65	70,44	189,16	199,27	179,18	195,70
6,66	70,09	188,52	198,85	178,53	195,05
6,67	69,95	187,70	198,46	178,06	194,45
6,66	69,37	186,81	198,09	177,49	193,81
6,67	69,76	186,25	197,67	177,00	193,09
6,66	68,62	185,39	197,25	176,47	192,46
6,66	68,88	184,47	196,89	175,82	191,93
6,66	68,52	183,76	196,51	175,22	191,31
6,66	68,50	182,82	196,08	174,70	190,67
6,66	68,33	182,27	195,69	174,14	190,16
6,66	67,56	181,68	195,32	173,75	189,60
6,66	67,76	181,00	194,98	173,19	189,08
6,67	68,00	180,33	194,58	172,81	188,48
6,67	67,45	179,51	194,20	172,27	188,01
6,66	67,09	178,74	193,80	171,81	187,32
6,67	67,06	178,24	193,39	171,39	186,86
6,65	66,45	177,67	193,08	170,94	186,45
6,67	66,57	176,96	192,71	170,42	185,89
6,67	66,19	176,47	192,33	169,99	185,56
6,65	66,24	176,08	191,98	169,64	185,08
6,67	65,39	175,47	191,60	169,20	184,60
6,66	65,54	174,83	191,20	168,73	184,11
6,67	65,38	174,35	190,89	168,30	183,67
6,67	65,10	173,71	190,52	167,89	183,20
6,67	64,74	173,04	190,17	167,63	182,74
6,66	64,68	172,69	189,83	167,12	182,28
6,68	64,71	172,22	189,49	166,74	181,85
6,65	64,46	171,84	189,18	166,31	181,43
6,68	63,93	171,24	188,80	166,05	180,96
6,67	63,83	170,91	188,49	165,71	180,62
6,67	63,84	170,62	188,18	165,38	180,19
6,67	63,48	170,16	187,84	165,09	179,79

6,66	63,00	169,54	187,54	164,74	179,40
6,67	63,10	169,27	187,22	164,44	178,95
6,67	63,16	168,75	186,86	164,16	178,58
6,66	62,63	168,19	186,51	163,83	178,17
6,67	62,92	167,94	186,20	163,50	177,83
6,66	62,55	167,65	185,88	163,20	177,45
6,65	62,34	167,17	185,58	162,94	177,12
6,67	62,09	166,98	185,26	162,64	176,74
6,66	62,27	166,45	184,94	162,42	176,41
6,67	61,64	165,99	184,61	162,24	176,04
6,67	61,69	165,64	184,31	162,06	175,72
6,66	61,83	165,22	184,03	161,69	175,44
6,68	61,37	165,00	183,73	161,42	175,05
6,66	61,70	164,53	183,49	161,12	174,80
6,67	61,45	164,29	183,16	160,85	174,47
6,67	61,23	163,91	182,83	160,66	174,06
6,66	61,03	163,57	182,54	160,40	173,79
6,66	60,77	163,21	182,27	160,05	173,46
6,66	61,10	162,97	181,98	159,83	173,19
6,67	60,86	162,72	181,66	159,63	172,86
6,67	60,57	162,43	181,43	159,49	172,62
6,66	60,16	162,11	181,15	159,32	172,35
6,76	60,42	161,82	180,89	159,09	172,07
6,77	60,38	161,43	180,65	158,72	171,72
6,74	59,95	161,21	180,42	158,63	171,59
6,76	59,88	160,95	180,16	158,54	171,34
6,75	59,72	160,62	179,92	158,30	171,08
6,75	59,35	160,22	179,62	158,13	170,75
6,76	59,10	159,79	179,37	157,88	170,50
6,76	59,23	159,37	179,09	157,77	170,17
6,75	59,08	159,14	178,84	157,55	169,87
6,76	58,83	158,86	178,60	157,39	169,58
6,76	59,10	158,58	178,38	157,30	169,35
6,75	58,68	158,48	178,20	157,27	169,15
6,77	58,82	158,18	177,95	157,26	168,98
6,76	58,64	157,93	177,72	157,13	168,76
6,78	58,84	157,61	177,48	157,20	168,54
6,77	58,77	157,28	177,24	157,08	168,33
6,76	58,79	156,93	177,06	157,11	168,08
6,77	58,52	156,65	176,85	157,13	167,95
6,76	58,42	156,40	176,65	157,07	167,70
6,75	58,36	155,95	176,42	157,06	167,51
6,78	58,34	155,85	176,21	157,02	167,33
6,77	58,09	155,63	175,98	157,02	167,11
6,77	57,90	155,29	175,75	157,06	166,97
6,75	57,77	154,82	175,58	157,08	166,75
6,78	57,99	154,73	175,38	156,92	166,66
6,77	57,46	154,44	175,15	156,91	166,37

6,77	57,28	154,11	174,91	156,96	166,20
6,73	57,36	153,87	174,71	156,86	165,95
6,77	57,29	153,72	174,52	156,76	165,76
6,73	57,01	153,47	174,35	156,57	165,54
6,77	57,34	153,16	174,16	156,40	165,35
6,77	57,56	153,00	173,93	156,22	165,16
6,76	57,42	152,85	173,73	156,04	164,98
6,76	57,05	152,57	173,51	155,74	164,70
6,78	57,04	152,37	173,37	155,48	164,45
6,77	56,63	152,16	173,10	155,25	164,15
6,76	56,72	151,96	172,89	154,91	163,95
6,75	56,59	151,64	172,61	154,67	163,73
6,76	56,44	151,53	172,37	154,40	163,42
6,78	56,55	151,39	172,20	154,13	163,35
6,77	56,60	151,27	172,04	154,02	163,11
6,76	56,25	151,00	171,82	153,84	162,94
6,76	56,19	150,75	171,67	153,58	162,74
6,77	55,46	150,66	171,48	153,45	162,49
6,77	55,58	150,49	171,30	153,35	162,26
6,75	55,57	150,23	171,15	153,14	162,08
6,78	55,60	150,14	171,00	152,90	161,87
6,77	55,50	149,79	170,78	152,62	161,60
6,75	55,28	149,51	170,64	152,35	161,39
6,77	55,03	149,34	170,47	152,13	161,26
6,77	54,69	149,18	170,36	151,99	161,05
6,76	55,06	148,95	170,19	151,79	160,83
6,75	54,84	148,61	170,00	151,64	160,56
6,75	54,76	148,57	169,83	151,47	160,27
6,75	54,61	148,26	169,69	151,22	160,13
6,79	54,57	148,13	169,55	151,10	159,88
6,75	54,54	147,90	169,40	150,95	159,71
6,75	54,03	147,74	169,21	150,79	159,47
6,76	54,06	147,45	169,08	150,65	159,21
6,75	54,29	147,34	168,99	150,59	159,06
6,74	53,74	147,17	168,79	150,51	158,85
6,78	53,94	147,03	168,70	150,38	158,68
6,76	53,82	146,75	168,50	150,19	158,51
6,76	53,97	146,44	168,32	150,08	158,23
6,76	53,94	146,27	168,16	149,93	158,15
6,77	53,86	145,91	168,04	149,82	157,94
6,74	53,92	145,53	167,89	149,63	157,81
6,74	53,76	145,35	167,78	149,55	157,53
6,74	53,51	145,32	167,61	149,39	157,30
6,77	53,65	145,19	167,42	149,29	157,06
6,75	53,44	145,01	167,27	149,19	156,94
6,75	53,45	144,95	167,18	149,09	156,74
6,75	53,44	144,75	167,06	148,97	156,64
6,79	52,90	144,60	166,88	148,80	156,42

6,75	52,86	144,47	166,71	148,63	156,22
6,75	53,06	144,34	166,62	148,48	156,12
6,76	52,76	144,29	166,51	148,49	155,96
6,75	53,15	144,03	166,37	148,28	155,84
6,76	53,12	144,04	166,22	148,26	155,70
6,76	52,94	143,90	166,08	148,01	155,44
6,74	53,10	143,89	165,91	147,94	155,30
6,75	52,76	143,64	165,79	147,92	155,11
6,77	52,63	143,42	165,68	147,80	155,07
6,77	52,48	143,32	165,58	147,69	154,95
6,75	52,61	143,15	165,48	147,66	154,75
6,76	52,60	143,19	165,34	147,56	154,61
6,77	52,51	143,01	165,19	147,47	154,43
6,74	52,19	142,79	165,10	147,39	154,37
6,76	52,13	142,61	164,98	147,37	154,29
6,76	52,36	142,41	164,93	147,37	154,16
6,76	51,98	142,35	164,71	147,33	153,98
6,76	52,40	142,30	164,67	147,18	153,97
6,74	51,91	142,20	164,59	147,13	153,85
6,73	51,88	142,04	164,41	147,07	153,72
6,75	52,10	141,99	164,33	146,95	153,63
6,74	52,03	141,92	164,22	146,91	153,56
6,76	51,87	141,77	164,08	146,90	153,33
6,75	51,53	141,58	163,97	146,73	153,29
6,77	51,92	141,44	163,86	146,71	153,15
6,74	51,75	141,31	163,78	146,60	153,02
6,77	51,81	141,24	163,57	146,50	152,88
6,75	51,59	141,11	163,44	146,37	152,77
6,76	51,70	141,06	163,34	146,29	152,63
6,75	51,93	140,97	163,23	146,18	152,45
6,75	51,62	140,92	163,13	146,14	152,35
6,76	51,60	140,83	163,01	146,02	152,22
6,76	51,35	140,77	162,91	145,98	152,11
6,75	51,12	140,80	162,80	145,89	152,03
6,75	50,83	140,81	162,70	145,79	151,87
6,78	51,10	140,67	162,56	145,77	151,79
6,75	51,18	140,48	162,46	145,69	151,70
6,74	51,15	140,60	162,35	145,68	151,50
6,75	50,86	140,50	162,22	145,58	151,50
6,77	50,87	140,19	162,16	145,40	151,49
6,76	51,11	140,21	162,05	145,34	151,34
6,77	51,08	140,16	161,95	145,32	151,27
6,78	51,03	139,70	161,86	145,31	151,14
6,75	50,72	139,77	161,66	145,22	151,03
6,75	50,86	139,81	161,53	145,11	150,92
6,76	51,07	139,75	161,48	145,10	150,89
6,77	50,70	139,73	161,40	144,93	150,80
6,78	50,81	139,53	161,27	144,93	150,71

6,76	50,42	139,51	161,19	144,90	150,62
6,75	50,41	139,60	161,13	144,79	150,56
6,78	50,24	139,54	161,03	144,61	150,44
6,75	50,57	139,60	160,94	144,60	150,41
6,76	50,63	139,47	160,81	144,56	150,27
6,75	50,64	139,32	160,72	144,47	150,25
6,75	50,63	139,20	160,64	144,37	150,23
6,76	50,58	139,17	160,60	144,32	150,15
6,78	50,61	139,14	160,48	144,24	150,10
6,76	50,83	139,07	160,37	144,31	149,96
6,73	50,32	138,95	160,33	144,29	149,96
6,76	50,21	138,98	160,25	144,14	149,84
6,75	50,56	138,98	160,12	144,08	149,75
6,74	50,28	138,98	160,07	143,94	149,76
6,75	50,13	138,92	159,93	143,92	149,61
6,76	50,36	138,90	159,89	143,92	149,60
6,77	50,48	138,83	159,79	143,94	149,51
6,78	50,28	138,78	159,68	143,87	149,43
6,77	50,07	138,75	159,64	143,77	149,44
6,77	50,14	138,65	159,53	143,71	149,32
6,76	50,35	138,50	159,43	143,62	149,21
6,75	50,29	138,35	159,31	143,62	149,19
6,79	50,22	138,38	159,22	143,48	149,14
6,75	50,44	138,43	159,11	143,40	149,15
6,77	50,28	138,53	159,05	143,44	149,04
6,76	50,35	138,33	159,01	143,26	149,04
6,77	50,42	138,14	158,87	143,13	148,94
6,73	50,12	137,83	158,81	143,04	148,86
6,75	50,07	137,76	158,66	143,01	148,75
6,77	50,12	137,75	158,54	143,01	148,73
6,75	50,26	137,54	158,51	142,89	148,71
6,76	50,20	137,62	158,38	142,86	148,63
6,76	49,58	137,59	158,34	142,78	148,50
6,75	49,61	137,59	158,21	142,75	148,41
6,76	49,54	137,66	158,15	142,73	148,37
6,77	49,81	137,62	158,05	142,74	148,30
6,75	49,35	137,63	157,94	142,68	148,22
6,76	49,55	137,57	157,87	142,54	148,20
6,77	49,60	137,57	157,76	142,51	148,14
6,78	49,63	137,63	157,69	142,43	148,07
6,78	49,80	137,62	157,64	142,38	148,08
6,77	50,05	137,52	157,53	142,40	148,00
6,78	49,67	137,36	157,40	142,28	147,88
6,74	49,40	137,20	157,30	142,22	147,82
6,76	49,80	137,04	157,22	142,19	147,75
6,78	49,43	137,00	157,12	142,13	147,76
6,75	49,46	137,00	157,04	142,04	147,66
6,76	49,36	137,02	156,97	141,88	147,68

6,74	49,35	137,05	156,89	141,81	147,61
6,75	49,68	137,10	156,81	141,80	147,46
6,75	49,67	137,13	156,76	141,69	147,56
6,75	49,42	137,18	156,65	141,69	147,43
6,75	49,59	137,24	156,57	141,62	147,49
6,77	49,63	137,25	156,49	141,58	147,42
6,74	49,36	137,25	156,40	141,53	147,31
6,77	49,38	137,09	156,36	141,51	147,39
6,77	49,50	137,17	156,29	141,50	147,31
6,76	49,11	137,08	156,24	141,50	147,26
6,78	49,55	137,04	156,22	141,42	147,26
6,78	49,26	137,11	156,16	141,36	147,19
6,78	49,15	137,09	156,07	141,42	147,14
6,77	49,05	137,07	156,04	141,32	147,15
6,77	49,14	137,08	156,00	141,39	147,09
6,76	49,14	136,95	155,95	141,35	147,13
6,78	49,42	136,83	155,91	141,26	147,03
6,77	49,05	136,72	155,79	141,23	146,94
6,77	49,03	136,62	155,75	141,12	146,90
6,77	49,17	136,55	155,64	141,06	146,78
6,75	49,37	136,38	155,62	141,04	146,80
6,76	49,16	136,53	155,52	140,96	146,72
6,77	49,23	136,38	155,51	140,91	146,77
6,75	49,20	136,40	155,42	140,88	146,75
6,77	49,27	136,35	155,36	140,86	146,68
6,78	49,37	136,33	155,31	140,85	146,67
6,75	49,06	136,12	155,25	140,86	146,59
6,76	48,77	136,10	155,16	140,78	146,59
6,75	48,50	136,18	155,14	140,81	146,58
6,76	48,79	136,19	155,05	140,77	146,53
6,78	48,87	136,00	154,97	140,75	146,46
6,76	48,49	135,98	154,89	140,70	146,45
6,78	48,91	136,01	154,81	140,69	146,37
6,75	48,40	136,03	154,77	140,65	146,42
6,76	48,75	136,08	154,69	140,63	146,38
6,56	48,88	136,02	154,62	140,46	146,39
6,60	48,82	135,92	154,60	140,24	146,37
6,59	48,70	135,86	154,52	140,15	146,35
6,59	48,56	136,00	154,44	140,11	146,29
6,58	48,52	135,83	154,32	140,03	146,20
6,56	48,67	135,89	154,28	139,96	146,25
6,59	48,60	135,88	154,18	139,94	146,21
6,58	48,63	135,72	154,08	139,80	146,08
6,56	48,57	135,74	153,98	139,68	145,98
6,59	48,43	135,52	153,90	139,69	145,90
6,59	48,63	135,55	153,80	139,61	145,89
6,56	48,89	135,35	153,70	139,56	145,83
6,57	48,73	135,25	153,63	139,54	145,78

6,57	48,84	135,26	153,53	139,50	145,72
6,56	48,49	135,13	153,45	139,47	145,69
6,57	48,72	135,05	153,37	139,39	145,60
6,56	48,36	135,20	153,27	139,26	145,59
6,56	48,50	135,18	153,17	139,24	145,52
6,56	48,72	135,14	153,06	139,22	145,45
6,56	48,62	134,99	152,99	139,14	145,43
6,58	48,63	135,06	152,87	139,11	145,32
6,56	48,64	135,03	152,81	139,01	145,30
6,55	48,72	135,12	152,69	138,93	145,19
6,57	48,41	134,99	152,57	138,99	145,09
6,55	48,37	134,88	152,53	138,93	145,04
6,56	48,53	134,85	152,44	138,90	145,00
6,56	48,48	134,85	152,34	138,84	145,00
6,57	48,29	134,78	152,27	138,81	144,96
6,57	48,49	134,64	152,15	138,76	144,79
6,55	48,40	134,56	152,08	138,71	144,81
6,57	48,44	134,50	151,99	138,61	144,75
6,56	48,49	134,48	151,93	138,48	144,69
6,56	48,09	134,53	151,78	138,44	144,58
6,56	48,55	134,27	151,70	138,32	144,53
6,57	48,68	134,28	151,57	138,23	144,49
6,57	48,26	134,20	151,53	138,13	144,48
6,58	48,12	133,94	151,42	137,96	144,33
6,58	48,21	133,98	151,34	137,90	144,37
6,58	47,97	134,02	151,28	137,79	144,34
6,59	47,97	133,94	151,19	137,66	144,26
6,56	48,35	133,88	151,09	137,63	144,15
6,54	48,24	133,79	151,02	137,62	144,10
6,59	48,59	133,70	150,92	137,55	144,06
6,56	48,36	133,71	150,81	137,52	143,99
6,57	48,21	133,56	150,73	137,50	143,94
6,54	48,22	133,48	150,63	137,41	143,84
6,56	48,45	133,49	150,51	137,33	143,74
6,57	48,47	133,33	150,42	137,30	143,66
6,56	48,41	133,33	150,34	137,27	143,61
6,60	48,49	133,36	150,24	137,06	143,54
6,57	48,29	133,15	150,18	137,04	143,52
6,55	48,50	133,07	150,05	137,02	143,42
6,58	48,60	132,93	149,95	136,91	143,35
6,56	48,53	133,02	149,85	136,78	143,32
6,56	48,35	133,03	149,74	136,66	143,13
6,51	48,01	132,98	149,62	136,56	143,03
6,56	48,28	132,52	149,53	136,48	143,00
6,56	47,95	132,47	149,42	136,37	142,93
6,57	48,11	132,49	149,39	136,39	142,89
6,56	48,35	132,30	149,33	136,42	142,87
6,55	48,41	132,33	149,30	136,37	142,75

6,57	48,04	132,24	149,26	136,24	142,75
6,56	47,94	132,12	149,22	136,13	142,73
6,57	48,26	131,99	149,15	135,99	142,61
6,57	48,02	132,04	149,08	135,85	142,55
6,56	48,04	131,96	149,06	135,73	142,54
6,56	47,79	131,83	149,01	135,65	142,48
6,54	47,78	131,74	148,96	135,62	142,38
6,57	47,86	131,62	148,94	135,57	142,38
6,56	47,87	131,47	148,89	135,48	142,26
6,56	47,66	131,45	148,82	135,40	142,19
6,56	47,91	131,32	148,79	135,34	142,10
6,56	47,83	131,08	148,71	135,20	142,05
6,55	48,15	130,97	148,63	135,13	141,97
6,57	48,05	130,83	148,56	134,92	141,87

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
183,17	39,04	19,41	26,57	42,07	2,88
183,97	44,83	17,61	25,69	42,13	4,87
184,80	46,95	15,59	25,34	40,62	4,45
185,60	44,12	15,52	25,92	40,64	4,42
186,34	41,96	15,65	26,23	41,16	4,40
187,07	40,25	15,06	25,30	40,75	4,38
187,86	38,79	14,43	26,26	40,33	4,34
188,59	37,56	14,04	26,09	39,90	4,32
189,34	36,70	14,37	25,14	40,26	4,30
189,94	35,92	14,11	26,02	40,65	4,28
190,55	35,50	14,27	26,29	41,22	4,26
191,18	35,09	13,86	24,20	40,95	4,24
191,69	34,68	13,97	26,27	41,33	4,22
192,15	34,37	14,14	25,95	40,71	4,20
192,52	34,22	13,67	24,89	39,09	4,18
192,90	34,19	13,58	25,96	40,07	4,16
193,19	34,14	13,78	26,00	40,48	4,14
193,41	34,05	13,93	25,93	39,99	4,12
193,61	34,02	14,17	26,52	41,35	4,11
193,80	33,90	13,25	26,65	40,38	4,08
193,88	33,94	13,85	26,82	41,29	4,06
193,94	33,85	13,91	27,26	42,12	4,04
193,95	33,79	13,50	26,29	40,43	4,02
193,96	33,80	13,56	25,91	39,83	4,00
193,97	33,73	13,42	26,45	40,19	3,99
193,83	33,73	13,92	26,03	40,20	3,97
193,68	33,59	13,55	25,40	40,50	3,95
193,48	33,62	13,74	25,50	40,38	3,93
193,21	33,50	13,70	26,07	41,49	3,91
193,03	33,54	13,53	27,10	41,58	3,89
192,74	33,44	13,21	26,36	39,99	3,87
192,49	33,45	13,73	26,84	40,29	3,85
192,17	33,53	13,84	26,56	39,94	3,83
191,88	33,49	13,26	25,93	39,96	3,81
191,49	33,46	13,10	25,55	39,46	3,79
191,11	33,39	13,49	26,98	40,58	3,78
190,74	33,43	13,34	26,01	40,47	3,76
190,32	33,45	13,33	26,37	40,25	3,74
189,94	33,42	13,48	26,79	39,98	3,72
189,51	33,39	13,52	25,94	40,29	3,70
189,07	33,44	13,81	25,67	40,41	3,68
188,63	33,40	13,67	26,34	40,86	3,65
188,14	33,36	13,57	25,40	40,54	3,63

187,63	33,35	13,71	26,47	40,75	3,61
187,20	33,40	13,65	25,65	40,54	3,59
186,66	33,45	13,81	25,74	40,69	3,57
186,09	33,46	13,89	26,16	40,43	3,55
185,61	33,49	13,68	25,47	40,39	3,52
185,10	33,47	13,93	26,71	41,66	3,50
184,64	33,40	13,96	26,82	41,27	3,48
184,11	33,40	14,01	25,97	41,06	3,46
183,61	33,42	14,15	25,88	41,21	3,44
183,17	33,35	13,69	26,17	40,22	3,42
182,67	33,36	13,84	26,25	40,03	3,39
182,07	33,32	13,99	25,18	40,02	3,37
181,55	33,33	13,99	27,47	40,91	3,35
181,10	33,33	13,85	26,33	40,78	3,33
180,54	33,33	14,03	26,08	40,45	3,31
179,96	33,20	14,02	26,49	40,40	3,28
179,45	33,22	14,04	27,12	41,66	3,26
178,88	33,14	14,12	26,80	40,46	3,24
178,38	33,10	14,12	26,24	40,26	3,22
177,90	33,05	13,97	26,88	41,99	3,20
177,38	33,06	14,34	27,30	42,12	3,18
176,82	33,07	14,02	26,01	40,10	3,16
176,32	33,00	13,96	25,78	39,94	3,14
175,98	32,94	14,03	26,13	41,31	3,11
175,47	32,97	14,18	26,00	41,20	3,09
175,00	32,95	13,98	25,85	39,65	3,07
174,36	32,95	14,00	26,21	39,94	3,05
173,95	33,02	14,35	26,20	40,03	3,03
173,43	33,02	13,93	26,44	40,15	3,01
172,94	33,04	13,83	26,52	40,83	2,99
172,56	33,01	13,87	26,03	40,60	2,97
172,11	32,98	13,62	26,43	40,46	2,94
171,66	32,89	13,88	27,27	41,44	2,92
171,26	32,86	13,76	27,27	41,58	2,90
170,74	32,91	13,64	26,51	40,59	2,88
170,37	32,98	14,01	25,60	39,38	2,86
170,00	32,99	13,81	25,81	41,40	2,84
169,59	32,97	13,82	25,68	40,96	2,82
169,17	32,88	13,68	26,41	40,22	2,80
168,75	32,85	13,76	26,00	40,84	2,78
168,39	32,87	13,82	26,48	40,08	2,76
168,04	32,97	13,69	26,38	40,52	2,74
167,66	32,96	13,63	25,88	40,17	2,72
167,42	32,91	13,70	26,09	40,08	2,70
167,03	32,88	13,71	25,72	39,79	2,68
166,71	32,84	13,64	26,50	39,91	2,66
166,44	32,89	13,70	26,42	40,46	2,64
166,09	32,86	13,64	25,62	40,54	2,62

165,79	32,88	13,45	25,95	40,08	2,60
165,46	32,85	13,94	26,14	40,31	2,58
165,22	32,87	13,62	26,56	40,80	2,56
164,92	32,81	13,40	26,09	40,45	2,54
164,69	32,84	13,81	25,74	39,64	2,52
164,38	32,80	13,51	27,05	40,75	2,50
164,15	32,83	13,78	26,42	40,15	2,48
163,86	32,82	13,61	26,67	42,06	2,46
163,69	32,84	13,28	26,30	40,30	2,44
163,38	32,84	13,66	25,98	40,40	2,42
163,22	32,79	13,21	26,20	40,32	2,40
163,03	32,68	13,37	27,21	40,67	2,38
162,83	32,53	13,51	26,87	41,35	2,36
162,61	32,49	13,47	25,96	40,25	2,34
162,48	32,55	13,54	25,99	40,78	2,32
162,29	32,57	13,65	25,17	39,91	2,30
162,15	32,67	13,60	25,44	39,59	2,28
162,04	32,70	13,37	25,52	39,29	2,26
161,83	32,72	13,67	26,19	39,54	2,24
161,70	32,68	13,41	26,75	40,58	2,23
161,53	32,57	13,30	25,61	39,60	2,21
161,34	32,41	13,46	25,38	40,41	2,19
161,21	32,38	13,56	26,02	39,71	2,17
161,07	32,33	13,22	25,55	38,86	2,15
160,91	32,31	13,34	25,37	39,23	2,13
160,90	32,31	13,27	25,52	39,68	2,12
160,76	32,29	13,13	25,83	38,87	2,10
160,79	32,20	13,62	25,30	38,68	2,08
160,67	32,18	13,20	26,00	39,52	2,06
160,52	32,21	13,33	26,53	41,42	2,05
160,47	32,16	13,27	26,09	39,92	2,03
160,43	32,14	13,26	26,05	39,60	2,01
160,41	32,08	13,28	25,60	38,68	2,00
160,44	32,02	12,96	26,86	39,99	1,98
160,42	32,01	13,03	24,65	39,47	1,96
160,46	32,06	12,94	27,69	42,17	1,95
160,55	32,07	12,98	26,37	39,82	1,93
160,50	32,05	12,72	25,62	39,22	1,92
160,59	31,99	12,95	26,46	40,14	1,90
160,64	31,95	12,77	26,15	40,45	1,89
160,71	31,91	12,80	26,60	40,84	1,87
160,68	31,93	12,59	26,45	39,75	1,86
160,75	31,90	12,42	26,05	40,05	1,84
160,88	31,85	12,64	25,87	38,81	1,83
161,06	31,75	12,38	25,24	40,26	1,81
161,09	31,75	12,09	25,87	40,04	1,80
161,22	31,73	12,27	25,84	39,53	1,79
161,31	31,68	12,33	26,45	40,01	1,77

161,47	31,74	12,51	25,87	40,11	1,76
161,53	31,75	12,17	25,47	40,77	1,75
161,70	31,60	12,07	25,72	39,68	1,73
161,85	31,54	12,40	25,08	39,73	1,72
162,00	31,50	12,07	25,30	39,84	1,70
162,07	31,44	12,05	25,89	39,91	1,69
162,22	31,44	11,82	25,33	38,91	1,68
162,36	31,37	11,65	26,19	39,55	1,67
162,51	31,29	11,65	25,78	40,09	1,66
162,66	31,28	11,42	26,27	40,20	1,65
162,85	31,28	11,70	26,17	39,95	1,64
162,95	31,13	11,56	25,72	39,37	1,63
163,08	30,99	11,41	24,99	40,11	1,62
163,20	30,96	11,48	27,23	42,78	1,61
163,39	30,84	11,25	27,66	42,82	1,60
163,65	30,77	11,27	26,13	39,95	1,59
163,81	30,67	11,31	25,55	39,27	1,58
164,04	30,63	11,11	25,09	40,10	1,57
164,18	30,56	10,94	24,65	40,19	1,56
164,42	30,45	11,02	26,49	39,86	1,55
164,56	30,44	11,16	25,05	39,50	1,54
164,75	30,28	10,65	25,39	39,09	1,54
164,83	30,09	10,80	25,72	39,25	1,53
165,01	29,99	10,85	25,59	39,62	1,52
165,17	29,84	10,61	25,45	40,38	1,51
165,33	29,91	10,60	25,60	40,05	1,50
165,52	29,89	10,18	25,73	39,24	1,49
165,71	29,88	10,51	25,37	38,86	1,49
165,89	29,84	10,48	26,05	39,62	1,48
166,03	29,79	10,66	26,86	41,07	1,47
166,18	29,55	10,26	26,49	39,91	1,46
166,31	29,44	10,54	26,59	41,04	1,46
166,50	29,43	10,19	26,29	38,96	1,45
166,75	29,43	10,37	25,65	40,03	1,44
166,87	29,33	10,25	26,55	40,13	1,44
167,03	29,22	10,08	25,84	39,04	1,43
167,11	29,17	9,87	26,54	38,81	1,42
167,23	29,12	10,19	25,37	39,24	1,41
167,41	29,00	10,07	26,69	39,92	1,40
167,60	29,09	9,81	26,62	39,77	1,40
167,74	29,08	9,98	25,68	40,19	1,39
167,84	29,08	9,75	25,97	39,32	1,38
168,06	29,06	9,89	24,94	38,97	1,38
168,17	29,05	9,98	25,52	38,89	1,37
168,31	28,98	9,60	25,60	40,46	1,36
168,45	28,91	9,62	25,56	39,39	1,35
168,59	28,88	9,45	26,10	39,60	1,35
168,75	28,85	9,53	25,58	39,86	1,34

168,90	28,91	9,23	25,55	39,08	1,34
169,05	28,84	9,11	25,17	39,17	1,34
169,17	28,75	9,32	25,46	39,83	1,33
169,34	28,68	9,16	26,05	40,20	1,33
169,42	28,60	9,38	26,22	39,46	1,32
169,54	28,55	9,42	27,20	40,09	1,31
169,62	28,52	9,40	25,59	39,76	1,31
169,75	28,43	9,33	24,95	38,97	1,30
169,86	28,37	8,92	24,97	39,97	1,30
170,00	28,39	9,21	25,41	39,91	1,29
170,13	28,37	9,19	25,65	38,23	1,29
170,25	28,37	9,05	25,81	38,75	1,28
170,36	28,35	8,95	25,95	39,42	1,28
170,50	28,38	9,01	25,51	39,21	1,27
170,62	28,34	8,99	27,27	40,72	1,27
170,73	28,30	8,77	26,60	40,18	1,26
170,83	28,28	8,66	25,00	39,72	1,26
170,95	28,28	8,44	27,04	40,41	1,26
171,13	28,19	8,63	25,80	40,02	1,26
171,31	28,13	8,39	26,82	40,74	1,26
171,37	28,10	8,43	25,83	38,87	1,26
171,45	28,03	8,36	24,74	39,86	1,26
171,52	27,95	8,18	25,64	39,24	1,25
171,69	27,93	8,23	25,84	39,61	1,25
171,82	27,87	8,15	25,56	39,15	1,25
171,95	27,88	8,11	26,07	39,70	1,25
172,11	27,84	8,26	25,93	39,38	1,24
172,23	27,84	8,11	24,98	39,51	1,24
172,30	27,80	7,90	25,91	39,58	1,24
172,45	27,75	7,94	25,84	39,24	1,24
172,56	27,71	7,83	25,78	39,22	1,24
172,64	27,65	7,70	25,74	38,93	1,23
172,74	27,61	7,66	25,16	39,83	1,23
172,88	27,58	7,79	24,94	38,36	1,23
173,03	27,55	7,53	25,74	39,49	1,23
173,14	27,49	7,51	25,89	39,50	1,23
173,29	27,49	7,44	24,94	39,03	1,23
173,43	27,43	7,42	26,45	40,00	1,22
173,54	27,43	7,13	26,00	39,40	1,22
173,69	27,37	7,17	25,51	39,48	1,22
173,80	27,36	7,25	25,57	40,13	1,22
173,93	27,39	7,38	26,40	40,54	1,21
174,10	27,33	7,43	25,26	40,33	1,21
174,16	27,31	7,17	24,47	39,64	1,21
174,34	27,21	7,16	24,92	39,05	1,21
174,46	27,20	7,22	25,45	39,89	1,20
174,56	27,14	7,19	25,84	39,08	1,20
174,71	27,09	6,90	25,42	38,80	1,20

174,91	27,12	7,26	24,99	39,71	1,20
174,98	27,10	6,90	24,52	39,24	1,20
175,11	27,07	7,09	25,52	39,57	1,19
175,27	27,00	7,08	26,03	39,98	1,19
175,37	26,96	6,74	26,43	39,20	1,19
175,45	26,94	6,85	25,09	39,85	1,19
175,61	26,97	7,10	25,28	39,69	1,18
175,67	26,94	6,90	25,97	39,08	1,18
175,79	26,91	6,63	26,17	40,13	1,18
175,89	26,88	6,71	25,77	39,84	1,18
175,96	26,82	6,62	25,70	38,79	1,18
176,06	26,77	6,61	25,06	39,81	1,18
176,18	26,72	6,56	25,69	39,24	1,17
176,28	26,71	6,57	24,92	39,11	1,17
176,41	26,70	6,69	25,28	40,31	1,17
176,49	26,64	6,65	25,61	40,03	1,17
176,57	26,64	6,58	25,57	39,04	1,17
176,57	26,63	6,52	25,54	39,36	1,16
176,70	26,61	6,47	25,28	39,22	1,16
176,73	26,57	6,27	26,06	38,95	1,16
176,84	26,60	6,18	25,34	40,00	1,16
176,92	26,56	6,09	25,69	39,20	1,16
176,91	26,52	6,23	26,05	39,35	1,16
177,00	26,54	6,09	25,23	39,34	1,15
177,13	26,50	6,23	26,03	40,25	1,15
177,14	26,42	6,09	26,00	39,86	1,15
177,19	26,46	6,41	25,72	38,91	1,15
177,19	26,50	6,10	25,95	39,81	1,15
177,31	26,44	6,16	25,78	39,46	1,15
177,34	26,43	6,33	26,09	40,01	1,14
177,38	26,41	6,18	25,79	39,43	1,14
177,49	26,26	5,98	25,52	39,20	1,14
177,46	26,19	6,07	25,87	39,95	1,14
177,55	26,19	6,17	25,86	39,64	1,14
177,51	26,14	6,02	25,46	39,91	1,14
177,55	26,16	6,00	25,31	39,34	1,13
177,59	26,19	5,68	25,86	39,08	1,13
177,64	26,18	6,05	25,31	39,35	1,13
177,64	26,18	6,01	25,67	39,48	1,13
177,70	26,15	5,83	26,57	38,99	1,13
177,76	26,06	5,78	27,36	39,64	1,12
177,72	26,07	5,89	25,69	39,11	1,12
177,76	26,10	5,83	25,68	39,67	1,12
177,72	26,11	5,78	25,99	39,57	1,12
177,80	26,06	5,81	25,97	39,03	1,12
177,76	26,06	5,51	25,82	38,91	1,12
177,76	26,01	5,72	25,72	40,32	1,11
177,79	26,01	5,69	26,12	39,53	1,11

177,70	26,04	5,67	25,65	38,90	1,11
177,71	26,01	5,72	25,73	39,76	1,11
177,68	25,96	5,57	26,14	39,35	1,11
177,64	25,95	5,44	26,39	40,18	1,10
177,59	25,91	5,62	26,04	40,25	1,10
177,56	25,89	5,65	25,64	38,92	1,10
177,55	25,89	5,64	25,64	39,70	1,10
177,41	25,90	5,61	25,93	39,74	1,10
177,39	25,94	5,62	25,09	38,61	1,10
177,36	25,94	5,52	25,89	39,01	1,10
177,33	25,92	5,41	25,82	39,52	1,09
177,20	25,93	5,33	25,82	39,36	1,09
177,15	25,90	5,42	25,91	39,25	1,09
177,02	25,86	5,53	26,23	40,37	1,09
176,93	25,82	5,28	24,65	39,67	1,09
176,92	25,81	5,27	26,50	39,66	1,08
176,78	25,77	5,26	25,38	39,29	1,08
176,66	25,78	5,56	24,76	39,24	1,08
176,61	25,66	5,35	25,37	39,37	1,08
176,53	25,64	5,39	26,21	39,39	1,08
176,40	25,64	5,40	25,34	39,73	1,07
176,29	25,64	5,17	25,79	39,23	1,07
176,19	25,62	5,11	25,75	39,02	1,07
176,09	25,59	5,29	26,23	39,40	1,07
175,97	25,54	5,22	24,93	39,45	1,07
175,90	25,55	5,16	25,69	39,53	1,07
175,80	25,54	5,19	25,17	39,09	1,06
175,70	25,56	5,14	25,46	40,36	1,06
175,57	25,57	5,10	25,45	39,20	1,06
175,43	25,55	5,38	26,94	42,09	1,06
175,35	25,56	5,26	27,55	43,40	1,06
175,27	25,50	5,19	27,19	41,44	1,06
175,11	25,44	5,30	27,10	43,65	1,05
175,02	25,43	5,42	29,35	44,39	1,05
174,88	25,44	5,36	26,60	42,47	1,05
174,77	25,45	5,34	27,98	42,32	1,05
174,71	25,39	5,21	27,21	42,62	1,05
174,63	25,34	5,16	27,63	42,35	1,05
174,52	25,27	5,42	27,06	41,75	1,04
174,39	25,25	5,31	27,71	42,47	1,04
174,26	25,21	5,20	26,36	42,15	1,04
174,20	25,15	5,01	27,10	42,78	1,04
174,05	25,15	5,07	27,88	42,80	1,04
173,92	25,15	5,19	27,89	42,25	1,04
173,81	25,13	5,18	26,95	42,49	1,04
173,72	25,13	5,06	27,42	42,93	1,03
173,56	25,15	5,29	26,94	42,13	1,03
173,42	25,13	5,36	27,60	42,57	1,03

173,26	25,15	5,16	26,91	43,23	1,03
173,19	25,14	5,09	27,47	42,76	1,03
173,10	25,11	5,08	27,81	41,89	1,03
172,94	25,06	5,15	27,27	42,63	1,02
172,88	25,02	5,05	28,05	42,29	1,02
172,71	24,95	5,03	28,06	42,90	1,02
172,62	24,92	5,21	27,42	41,80	1,02
172,53	24,89	5,20	26,59	42,73	1,02
172,42	24,78	4,80	27,03	41,95	1,02
172,41	24,76	4,90	27,11	42,11	1,01
172,17	24,71	5,14	27,55	42,29	1,01
172,06	24,68	5,14	27,69	42,67	1,01
171,97	24,58	5,14	25,47	39,64	1,01
171,82	24,55	5,31	26,97	39,42	1,01
171,77	24,49	4,99	25,86	39,28	1,01
171,65	24,49	4,97	25,41	39,13	1,00
171,46	24,48	4,83	25,79	40,07	1,00
171,39	24,53	4,98	25,95	39,23	1,00
171,33	24,59	4,82	25,78	40,04	1,00
171,19	24,58	4,91	26,30	40,44	1,00
171,12	24,59	4,84	26,14	39,26	1,00
171,01	24,53	4,83	25,73	39,44	1,00
170,86	24,53	4,84	25,37	39,67	0,99
170,77	24,60	4,75	25,21	39,47	0,99
170,69	24,61	4,79	26,49	39,81	0,99
170,63	24,61	5,00	25,66	39,93	0,99
170,49	24,67	4,83	25,87	40,89	0,99
170,46	24,69	4,53	25,48	40,13	0,99
170,28	24,68	4,89	25,15	38,91	0,98
170,24	24,73	4,52	25,74	38,96	0,98
170,17	24,69	4,76	25,16	40,01	0,98
170,03	24,72	4,67	25,19	40,01	0,98
169,93	24,75	4,66	25,07	39,45	0,98
169,79	24,74	4,71	26,24	40,25	0,98
169,74	24,79	4,65	25,65	39,78	0,97
169,66	24,78	4,73	26,05	39,85	0,97
169,56	24,76	4,78	25,67	39,26	0,97
169,57	24,75	4,52	25,67	39,33	0,97
169,40	24,70	4,47	25,67	39,15	0,97
169,33	24,73	4,63	25,54	40,18	0,97
169,17	24,70	4,47	26,15	39,17	0,97
169,05	24,66	4,45	25,79	39,36	0,96
168,96	24,63	4,42	25,03	40,17	0,96
168,98	24,64	4,59	25,67	39,60	0,96
168,86	24,56	4,55	26,06	38,92	0,96
168,77	24,54	4,45	25,83	40,45	0,96
168,62	24,67	4,73	25,45	39,43	0,96
168,50	24,65	4,47	26,35	40,34	0,95

168,47	24,60	4,48	26,05	39,99	0,95
168,25	24,55	4,62	24,78	39,14	0,95
168,28	24,53	4,46	26,24	40,80	0,95
168,22	24,55	4,32	26,79	40,54	0,95
168,06	24,47	4,27	25,54	39,67	0,95
167,93	24,48	4,32	26,48	41,19	0,95
167,88	24,47	4,53	24,65	39,28	0,94
167,81	24,50	4,54	25,96	40,15	0,94
167,75	24,51	4,46	25,96	40,70	0,94
167,62	24,50	4,28	26,41	40,98	0,94
167,56	24,50	4,67	27,05	40,25	0,94
167,50	24,44	4,33	25,92	40,00	0,94
167,47	24,44	4,45	26,02	39,42	0,93
167,32	24,44	4,25	26,13	39,46	0,93
167,25	24,50	4,27	25,64	39,93	0,93
167,16	24,52	4,19	26,38	39,63	0,93
167,03	24,54	4,27	25,39	39,23	0,93
166,90	24,48	4,22	25,58	40,74	0,93
166,93	24,50	4,44	25,46	39,58	0,92
166,84	24,52	4,48	26,51	40,30	0,92
166,75	24,49	4,14	26,31	39,55	0,92
166,71	24,44	4,13	25,98	39,47	0,92
166,71	24,44	4,24	24,81	39,02	0,92
166,49	24,43	4,35	25,60	39,29	0,92
166,46	24,40	4,45	25,16	38,95	0,91
166,37	24,39	4,48	26,04	40,35	0,91
166,33	24,39	4,16	25,94	39,56	0,91
166,21	24,39	4,28	25,42	39,28	0,91
166,17	24,41	4,42	25,39	39,52	0,91
166,05	24,40	4,35	26,06	39,41	0,91
166,01	24,40	3,98	26,10	39,30	0,91
165,96	24,39	4,25	25,76	39,13	0,90
165,91	24,37	4,25	26,30	39,43	0,90
165,77	24,37	4,45	26,72	39,97	0,90
165,74	24,38	4,38	25,42	39,73	0,90
165,72	24,35	4,41	26,13	38,81	0,90
165,64	24,30	4,30	25,62	39,51	0,90
165,55	24,26	4,46	26,52	39,92	0,90
165,38	24,28	4,26	26,06	39,49	0,89
165,37	24,25	4,14	25,96	39,14	0,89
165,30	24,28	4,31	25,79	38,98	0,89
165,24	24,32	4,31	25,87	39,74	0,89
165,18	24,32	4,27	26,20	40,38	0,89
165,15	24,35	4,42	25,49	39,57	0,89
165,03	24,33	4,41	26,03	40,21	0,88
164,95	24,33	4,38	26,50	39,81	0,88
164,88	24,33	4,22	25,03	39,83	0,88
164,89	24,31	3,96	25,23	38,70	0,88

164,83	24,34	4,14	24,71	37,68	0,88
164,71	24,33	4,15	24,78	38,37	0,88
164,67	24,31	4,24	25,21	38,72	0,88
164,58	24,26	4,41	24,85	38,02	0,87
164,52	24,28	4,16	24,33	38,60	0,87
164,37	24,29	4,18	25,19	38,87	0,87
164,30	24,28	4,08	23,80	38,37	0,87
164,19	24,24	4,19	24,20	38,07	0,87
164,25	24,29	4,45	24,16	37,82	0,87
164,28	24,30	4,32	25,67	38,09	0,86
164,14	24,30	4,39	24,47	38,23	0,86
164,06	24,34	4,20	25,22	38,51	0,86
163,92	24,36	4,01	24,50	38,69	0,86
163,86	24,36	4,04	24,88	38,33	0,86
163,93	24,38	4,30	25,18	38,72	0,86
163,75	24,36	4,30	24,85	38,24	0,86
163,74	24,30	4,22	24,63	39,32	0,85
163,70	24,25	4,45	24,61	38,55	0,85
163,51	24,27	4,30	24,59	39,06	0,85
163,49	24,25	4,21	25,25	38,89	0,85
163,48	24,21	4,13	24,48	38,20	0,85
163,41	24,22	4,21	24,59	38,12	0,85
163,36	24,23	4,24	25,23	38,12	0,84
163,24	24,20	3,96	25,38	38,42	0,84
163,27	24,16	4,10	24,14	37,99	0,84
163,11	24,17	4,25	24,25	37,89	0,84
163,21	24,19	4,25	23,86	37,80	0,84
163,09	24,16	4,12	25,84	38,78	0,84
163,04	24,17	4,00	23,61	39,20	0,84
162,99	24,14	4,21	24,34	37,42	0,83
162,86	24,14	4,17	25,47	38,76	0,83
162,81	24,12	4,17	25,25	39,06	0,83
162,69	24,16	4,03	24,48	38,47	0,83
162,81	24,16	4,20	25,96	39,00	0,83
162,64	24,16	3,98	24,79	38,29	0,83
162,66	24,17	3,94	24,51	38,25	0,82
162,52	24,18	4,06	24,17	38,36	0,82
162,49	24,19	3,89	24,40	38,64	0,82
162,46	24,23	4,03	25,40	38,39	0,82
162,41	24,24	4,15	24,94	38,23	0,82
162,33	24,25	4,11	24,94	37,76	0,82
162,32	24,20	4,05	24,15	37,84	0,82
162,27	24,17	4,05	25,46	38,46	0,81
162,25	24,14	4,02	24,65	38,10	0,81
162,24	24,13	3,98	25,72	38,93	0,81
162,15	24,14	3,89	24,90	39,04	0,81
162,06	24,11	3,95	25,28	38,60	0,81
161,99	24,11	3,81	25,45	37,44	0,81

161,94	24,13	3,78	24,89	38,35	0,80
162,02	24,08	4,09	25,34	38,65	0,80
161,79	24,13	4,18	24,32	38,36	0,80
161,92	24,09	4,02	24,32	38,17	0,80
161,77	24,10	4,08	24,62	38,44	0,80
161,80	24,07	3,97	24,10	38,05	0,80
161,78	24,05	3,88	24,90	38,16	0,80
161,56	24,03	4,04	24,53	38,27	0,80
161,58	24,04	4,00	24,42	38,15	0,79
161,53	24,07	4,17	24,72	37,68	0,79
161,48	24,06	3,96	24,71	38,38	0,79
161,46	24,06	3,85	24,17	38,83	0,79
161,53	24,04	3,84	24,75	38,58	0,79
161,42	24,05	4,05	24,28	38,62	0,79
161,49	24,05	4,08	25,06	37,56	0,79
161,41	23,99	4,07	25,74	38,98	0,78
161,35	24,03	3,94	24,24	38,37	0,78
161,25	23,99	4,07	24,93	38,37	0,78
161,18	23,97	4,23	24,60	37,81	0,78
161,17	23,99	3,92	24,15	38,28	0,78
161,02	23,94	3,95	24,60	37,60	0,78
161,03	23,95	4,04	24,77	37,97	0,78
160,96	23,97	4,02	24,47	37,10	0,77
160,95	24,01	4,15	24,87	39,56	0,77
160,88	24,00	4,12	24,13	39,01	0,77
160,82	23,95	4,09	24,91	38,51	0,77
160,83	23,95	3,97	24,72	38,19	0,77
160,81	23,93	3,85	25,11	39,32	0,77
160,73	23,94	3,98	24,49	38,10	0,76
160,68	23,99	3,97	25,53	38,22	0,76
160,66	24,04	3,98	24,48	37,97	0,76
160,63	24,02	3,70	24,93	37,93	0,76
160,57	24,02	3,80	24,44	37,82	0,76
160,51	24,09	3,84	25,03	37,76	0,76
160,50	24,09	3,90	24,25	37,83	0,76
160,43	24,10	4,02	25,13	37,90	0,75
160,42	24,06	4,10	24,67	39,08	0,75
160,32	24,01	4,00	24,70	38,84	0,75
160,27	24,01	3,92	24,62	37,87	0,75
160,29	24,03	3,96	24,88	38,06	0,75
160,17	24,03	3,98	24,67	39,04	0,75
160,07	24,05	3,84	25,43	39,25	0,75
159,94	24,01	3,91	24,23	38,11	0,74
159,97	23,96	3,98	25,17	37,95	0,74
159,91	23,94	4,06	25,74	38,69	0,74
159,89	23,93	3,97	25,07	38,31	0,74
159,82	23,94	4,11	25,30	37,90	0,74
159,78	23,91	4,08	24,91	37,55	0,74

159,75	23,90	4,13	25,08	38,71	0,73
159,74	23,83	3,93	24,13	38,39	0,73
159,71	23,85	3,86	24,71	37,49	0,73
159,58	23,85	3,72	24,15	38,95	0,73
159,60	23,85	3,88	24,61	38,35	0,73
159,52	23,84	3,97	24,03	38,30	0,73
159,43	23,88	3,78	24,22	38,24	0,73
159,41	23,89	3,83	25,75	38,57	0,73
159,32	23,90	3,97	25,01	39,15	0,72
159,28	23,93	3,96	24,81	37,41	0,72
159,22	23,95	4,16	25,11	37,82	0,72
159,19	23,97	3,97	24,38	37,77	0,72
159,15	23,94	3,72	24,42	37,74	0,72
159,12	24,00	3,93	25,02	37,81	0,72
159,11	24,03	3,94	23,90	38,00	0,71
159,14	24,03	3,86	24,87	38,05	0,71
158,94	23,97	4,06	24,95	38,16	0,71
158,96	23,93	3,89	24,83	38,79	0,71
158,85	23,88	3,94	24,71	37,93	0,71
158,76	23,87	4,05	24,90	38,62	0,71
158,75	23,87	4,00	25,54	39,03	0,71
158,65	23,82	3,82	24,74	37,91	0,70
158,61	23,84	3,71	24,03	38,40	0,70
158,51	23,89	3,98	24,57	38,19	0,70
158,42	23,86	3,81	25,99	38,44	0,70
158,42	23,83	3,73	24,14	38,72	0,70
158,32	23,82	3,91	25,58	38,74	0,70
158,35	23,78	3,76	24,91	38,00	0,70
158,29	23,83	3,94	25,31	37,98	0,69
158,27	23,86	3,96	24,62	38,01	0,69
158,19	23,87	3,91	25,08	38,29	0,69
158,17	23,89	3,78	25,09	38,59	0,69
158,08	23,88	3,92	24,71	38,23	0,69
158,07	23,86	4,00	24,02	38,11	0,69
157,98	23,83	3,77	24,44	38,09	0,69
157,88	23,82	3,88	25,19	38,93	0,68
157,78	23,89	3,97	25,08	37,99	0,68
157,75	23,83	3,89	24,08	38,71	0,68
157,77	23,81	3,93	24,52	37,91	0,68
157,68	23,73	3,87	25,42	39,04	0,68
157,58	23,70	3,96	24,37	37,73	0,68
157,50	23,64	4,08	24,67	38,98	0,68
157,49	23,64	3,94	24,80	37,76	0,68
157,44	23,68	3,92	24,89	38,11	0,67
157,42	23,64	3,99	24,46	37,82	0,67
157,29	23,64	3,84	24,96	38,14	0,67
157,27	23,66	3,84	24,72	38,12	0,67
157,29	23,63	3,98	25,17	37,71	0,67

157,17	23,67	4,03	25,03	38,08	0,67
157,17	23,74	3,88	24,89	38,11	0,67
157,16	23,73	3,86	24,79	37,51	0,66
157,11	23,77	4,14	25,54	37,40	0,66
156,87	23,77	4,02	24,90	38,15	0,66
156,86	23,78	4,03	23,91	37,55	0,66
156,81	23,73	3,80	25,21	37,96	0,66
156,72	23,74	4,06	25,26	38,27	0,66
156,62	23,74	3,89	25,24	37,80	0,66
156,58	23,78	3,90	24,82	37,50	0,66
156,47	23,88	3,85	24,45	38,14	0,66
156,38	23,84	3,96	24,11	38,44	0,65
156,29	23,80	4,10	24,65	37,68	0,65
156,15	23,77	3,85	24,58	37,71	0,65

CO-Lav - [100ppm]	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
7,42	0,09	2,72
4,86	0,07	1,73
11,24	0,12	1,47
22,44	0,56	6,07
22,44	0,42	7,94
16,81	0,19	11,35
22,44	0,28	12,48
22,44	0,36	11,60
22,44	0,41	11,12
22,44	0,38	11,53
22,44	0,43	11,96
22,44	0,39	12,13
22,44	0,38	12,22
22,44	0,34	12,28
22,44	0,29	12,51
22,44	0,30	12,56
22,44	0,27	12,77
22,44	0,26	12,89
22,44	0,26	12,80
22,44	0,27	12,64
22,44	0,30	12,72
22,44	0,29	12,64
22,44	0,29	12,80
22,44	0,28	12,78
22,44	0,28	12,79
22,44	0,26	12,81
22,44	0,26	12,86
22,44	0,25	12,90
20,72	0,22	12,88
21,59	0,23	12,92
19,43	0,21	12,93
20,69	0,22	13,00
17,56	0,20	13,14
15,60	0,17	13,17
15,42	0,17	13,27
12,66	0,14	13,27
10,44	0,12	13,42
8,37	0,10	13,54
8,33	0,10	13,74
9,39	0,11	13,99
12,91	0,14	14,49
14,52	0,15	15,00
15,44	0,17	15,27

16,36	0,17	15,18
16,09	0,17	15,42
16,33	0,17	15,52
14,26	0,16	15,43
15,96	0,18	15,54
15,46	0,16	15,51
14,52	0,17	15,54
15,77	0,17	15,78
20,12	0,21	15,71
14,46	0,17	15,37
16,79	0,18	15,45
14,95	0,16	15,38
16,12	0,18	15,42
17,19	0,19	15,52
19,37	0,20	15,51
13,28	0,15	15,33
14,15	0,15	15,46
15,48	0,18	15,33
14,31	0,15	15,52
15,40	0,17	15,53
15,44	0,18	15,54
17,36	0,18	15,43
21,01	0,22	15,61
22,44	0,27	15,72
22,44	0,29	15,74
22,44	0,28	15,81
22,44	0,28	15,77
22,44	0,28	15,89
22,44	0,27	15,86
22,44	0,29	15,76
22,44	0,27	15,79
22,44	0,28	15,66
21,60	0,23	15,73
19,87	0,22	15,78
19,05	0,21	15,69
20,70	0,22	15,73
21,26	0,23	15,73
22,04	0,24	15,79
19,06	0,21	15,63
19,11	0,21	15,63
18,25	0,19	15,65
19,01	0,20	15,67
21,28	0,23	15,79
20,78	0,22	15,84
19,69	0,22	15,81
21,82	0,23	15,94
22,44	0,26	15,95
22,44	0,25	15,92

22,44	0,28	15,97
22,44	0,28	16,03
22,44	0,30	16,21
22,44	0,31	16,11
22,44	0,34	16,18
22,44	0,32	16,22
22,44	0,33	16,19
22,44	0,31	16,11
22,44	0,32	16,18
22,44	0,32	16,18
22,44	0,34	16,23
22,44	0,33	16,26
22,44	0,33	16,39
22,44	0,34	16,41
22,44	0,39	16,60
22,44	0,49	16,81
22,44	0,64	17,04
22,44	0,74	17,00
22,44	0,81	17,09
22,44	0,65	16,88
22,44	0,45	16,56
22,44	0,39	16,41
22,44	0,36	16,46
22,44	0,33	16,44
22,44	0,32	16,36
22,44	0,34	16,24
22,44	0,30	16,23
22,44	0,30	16,20
22,44	0,32	16,14
22,44	0,31	16,08
22,44	0,33	16,01
22,44	0,27	15,84
19,96	0,22	15,62
17,07	0,18	15,41
14,25	0,16	15,25
14,28	0,16	15,23
14,02	0,16	15,04
12,50	0,14	14,91
13,29	0,15	14,68
15,90	0,17	14,63
18,98	0,21	14,61
19,72	0,21	14,47
22,44	0,26	14,39
22,44	0,25	14,31
21,24	0,23	14,27
19,90	0,21	14,29
22,44	0,25	14,06
22,44	0,26	14,14

22,44	0,26	14,17
22,44	0,28	14,26
22,44	0,31	14,45
22,44	0,30	14,59
22,44	0,28	14,34
22,44	0,27	13,97
17,70	0,20	13,53
10,07	0,12	13,06
4,46	0,07	11,95
4,37	0,05	11,69
4,30	0,06	11,63
4,55	0,05	11,39
4,32	0,05	11,33
4,80	0,06	11,12
4,64	0,06	11,13
4,78	0,06	10,98
5,32	0,07	10,91
5,31	0,07	10,88
5,35	0,06	10,72
5,48	0,06	10,69
5,71	0,08	10,66
5,87	0,08	10,59
5,94	0,07	10,57
5,70	0,07	10,53
5,78	0,07	10,60
5,34	0,07	10,53
6,11	0,07	10,56
5,76	0,07	10,43
6,51	0,08	10,47
6,33	0,09	10,35
6,26	0,08	10,40
6,35	0,09	10,27
7,35	0,08	10,22
7,31	0,08	10,10
7,96	0,10	10,06
7,63	0,10	10,09
8,24	0,09	10,09
8,46	0,11	10,12
8,52	0,11	10,11
8,93	0,11	10,20
9,23	0,11	10,16
9,43	0,11	10,21
8,87	0,10	10,22
8,71	0,10	10,24
9,58	0,11	10,03
9,17	0,11	9,93
8,67	0,10	9,94
6,96	0,08	9,57

8,34	0,09	9,19
10,63	0,12	9,20
11,48	0,13	9,09
10,94	0,12	9,10
10,46	0,12	9,13
10,58	0,12	9,24
9,29	0,11	9,32
9,13	0,10	9,26
9,73	0,12	9,38
9,72	0,12	9,38
9,98	0,11	9,26
10,38	0,12	9,17
10,34	0,12	9,05
10,43	0,12	9,07
9,78	0,11	9,01
9,34	0,11	9,10
9,00	0,11	8,94
11,12	0,12	8,31
22,44	0,29	7,76
22,44	0,62	6,86
22,44	0,67	6,54
22,44	0,71	6,42
22,44	0,61	6,49
22,44	0,66	6,26
22,44	0,69	6,27
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22,44	0,69	6,19
22,44	0,67	6,19
22,44	0,67	6,27
22,44	0,67	6,26
22,44	0,65	6,22
22,44	0,64	6,26
22,44	0,65	6,22
22,44	0,65	6,27
22,44	0,64	6,27
22,44	0,65	6,30
22,44	0,63	6,24
22,44	0,63	6,23
22,44	0,63	6,27
22,44	0,61	6,17
22,44	0,61	6,26
22,44	0,62	6,30
22,44	0,62	6,28
22,44	0,61	6,28
22,44	0,61	6,29
22,44	0,60	6,30
22,44	0,61	6,30
22,44	0,60	6,22

22,44	0,60	6,29
22,44	0,60	6,29
22,44	0,60	6,29
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22,44	0,57	6,55
22,44	0,56	6,56
22,44	0,57	6,56
22,44	0,57	6,53
22,44	0,56	6,50
22,44	0,56	6,57
22,44	0,56	6,53
22,44	0,56	6,56
22,44	0,56	6,55
22,44	0,57	6,48
22,44	0,56	6,44
22,44	0,57	6,52
22,44	0,56	6,50
22,44	0,55	6,54
22,44	0,57	6,55
22,44	0,57	6,58
22,44	0,56	6,54
22,44	0,56	6,57
22,44	0,55	6,59
22,44	0,55	6,59
22,44	0,57	6,69

22,44	0,56	6,64
22,44	0,57	6,70
22,44	0,57	6,65
22,44	0,57	6,71
22,44	0,57	6,64
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22,44	0,58	6,65
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22,44	0,57	6,58
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22,44	0,57	6,62
22,44	0,57	6,69
22,44	0,57	6,66
22,44	0,57	6,64
22,44	0,57	6,69
22,44	0,57	6,66
22,44	0,56	6,65
22,44	0,56	6,62
22,44	0,56	6,65
22,44	0,56	6,65
22,44	0,57	6,64
22,44	0,57	6,70
22,44	0,57	6,69
22,44	0,57	6,70
22,44	0,56	6,60
22,44	0,56	6,64
22,44	0,56	6,66
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22,44	0,57	6,54
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22,44	0,54	6,45

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22,44	0,54	6,56
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22,44	0,53	6,57
22,44	0,53	6,62
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22,44	0,53	6,69
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22,44	0,52	6,75
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22,44	0,53	6,75
22,44	0,52	6,67
22,44	0,51	6,71
22,44	0,52	6,76
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22,44	0,53	6,66
22,44	0,53	6,69
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22,44	0,53	6,68
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22,44	0,53	6,68
22,44	0,54	6,67
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22,44	0,56	6,69
22,44	0,57	6,71
22,44	0,55	6,65
22,44	0,55	6,66
22,44	0,55	6,68
22,44	0,54	6,68
22,44	0,54	6,68
22,44	0,54	6,70
22,44	0,54	6,68
22,44	0,53	6,67
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22,44	0,54	6,72
22,44	0,54	6,72
22,44	0,54	6,69
22,44	0,53	6,71
22,44	0,53	6,69
22,44	0,52	6,69
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22,44	0,52	6,73
22,44	0,51	6,71
22,44	0,51	6,71
22,44	0,52	6,74
22,44	0,51	6,72
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22,44	0,51	6,72
22,44	0,52	6,75
22,44	0,50	6,67
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22,44	0,50	6,73
22,44	0,51	6,75
22,44	0,50	6,74
22,44	0,49	6,72
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22,44	0,51	6,78
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22,44	0,51	6,80
22,44	0,51	6,86
22,44	0,50	6,83
22,44	0,49	6,82
22,44	0,50	6,86
22,44	0,49	6,82
22,44	0,49	6,79
22,44	0,50	6,80
22,44	0,51	6,69
22,44	0,50	6,69

22,44	0,50	6,71
22,44	0,50	6,72
22,44	0,51	6,76
22,44	0,49	6,70
22,44	0,49	6,70
22,44	0,50	6,69
22,44	0,48	6,72
22,44	0,49	6,70
22,44	0,49	6,71
22,44	0,49	6,70
22,44	0,49	6,67
22,44	0,49	6,72
22,44	0,48	6,68
22,44	0,48	6,71
22,44	0,48	6,72
22,44	0,48	6,67
22,44	0,47	6,63
22,44	0,48	6,64
22,44	0,47	6,63
22,44	0,48	6,64
22,44	0,48	6,67
22,44	0,49	6,72
22,44	0,48	6,69
22,44	0,49	6,69
22,44	0,49	6,68
22,44	0,48	6,66
22,44	0,48	6,65
22,44	0,48	6,63
22,44	0,47	6,70
22,44	0,47	6,66
22,44	0,49	6,69
22,44	0,48	6,69
22,44	0,48	6,67
22,44	0,48	6,68
22,44	0,48	6,72
22,44	0,49	6,71
22,44	0,48	6,65
22,44	0,49	6,61
22,44	0,48	6,65
22,44	0,48	6,66
22,44	0,48	6,68
22,44	0,48	6,67
22,44	0,48	6,64
22,44	0,48	6,66
22,44	0,48	6,64
22,44	0,49	6,67
22,44	0,47	6,63
22,44	0,47	6,63

22,44	0,48	6,63
22,44	0,47	6,57
22,44	0,48	6,57
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22,44	0,48	6,58
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22,44	0,46	6,59
22,44	0,47	6,57
22,44	0,48	6,58
22,44	0,47	6,53
22,44	0,46	6,59
22,44	0,46	6,55
22,44	0,46	6,51
22,44	0,46	6,54
22,44	0,46	6,56
22,44	0,45	6,55
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22,44	0,45	6,59
22,44	0,45	6,60
22,44	0,46	6,56
22,44	0,45	6,57
22,44	0,45	6,61
22,44	0,45	6,61
22,44	0,45	6,57
22,44	0,44	6,51
22,44	0,44	6,50
22,44	0,45	6,56
22,44	0,44	6,51
22,44	0,45	6,56
22,44	0,44	6,50
22,44	0,44	6,50
22,44	0,44	6,53
22,44	0,44	6,46
22,44	0,44	6,51
22,44	0,45	6,39
22,44	0,48	6,06
22,44	0,48	5,93
22,44	0,46	5,90
22,44	0,45	5,89
22,44	0,44	5,86
22,44	0,43	5,85
22,44	0,44	5,86
22,44	0,44	5,80

22,44	0,44	5,83
22,44	0,43	5,76
22,44	0,43	5,76
22,44	0,43	5,79
22,44	0,43	5,75
22,44	0,43	5,77
22,44	0,43	5,77
22,44	0,43	5,68
22,44	0,43	5,74
22,44	0,43	5,72
22,44	0,43	5,70
22,44	0,43	5,72
22,44	0,42	5,67
22,44	0,42	5,67

Annex 24

Title: Materials data sheets

Pages total: 32, excl this cover page

Basic/material

E-glass.

Description

The basic material of the packing consists of 6-9 micron E-glass fiber strands, which are textured. The product is inorganic, sterile, refractory, and contains no toxins or heavy metals.

Thanks to a high-temperature treatment, the packing can be used up to 650 °C.

This treatment makes the packing retain its flexibility even with high temperature effects. At the same time, the black coating binds the loose fibers, and the packing retains its color throughout its lifetime.



Dimensions and technical data

Dimensions: Ø 6-16 mm

Length: 50-150 mm

Temperature: 650 °C

Colour: Black

Application: Packing/sealing

Flammability: Inflammable

Glaskeramik NEOCERAM N-0

Technische Daten

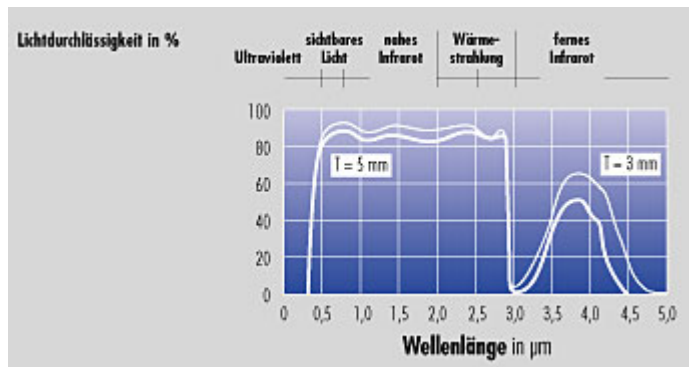
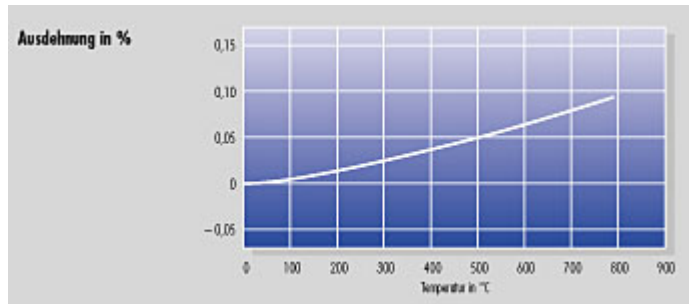
Wärmeausdehnung

Lichtdurchlässigkeit

[Oberflächenbeschaffenheit](#)
[Flache Scheiben/Beschichtete Glaskeramik/Einbaurichtlinien](#)

Technische Daten

Ausdehnungs- koeffizient	· 10 ⁻⁷ /K	(30 - 380° C) – 6 (30 - 750° C) – 3
Temperatur- wechselbeständigkeit	°C	800
Maximale Betriebstemperatur	°C	kontinuierlich 700 kurzzeitig 800
Wärmeleitfähigkeit	W/m · K (25° C)	1,51
Spezifische Wärme	J/kg · K	712
Dichte	g/cm ³	2,51
Biege- und Schlagfestigkeit	entsprechen den Eigenschaften von Gussglas	



ROBAX® Glass Ceramic Panels

Technical Delivery Specification TL 1 00 05 51 - 00

SCHOTT
ROBAX®

ROBAX® Glass Ceramic Panels

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1. Description, Range of Application and Validity

1.1 Description

ROBAX® glass ceramic panels consist of a transparent glass ceramic material. Because of its material characteristics the product is designed for the use as thermal window in fireplaces. Other technical applications and shapes have to be proved separately.

1.2 Range of Application

This technical delivery specification applies to ROBAX® glass ceramic panels (delivery form: flat stock-size sheets, cut-to-size-panels and bent panels) for applications which require a low thermal expansion and transparency:

- electric, oil or gas stoves
- conventional heated fireplaces and room heaters (wood, coal, pellets, ...)
- baking ovens
- special applications on request

1.3 Range of Validity

This technical delivery specification applies to the commercial relationship between the Business Unit Home Tech and its customers.

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2. Technical Features

2.1 General Remarks

All data stated in this technical delivery specification are to be seen as guideline values. Those values, for which no generally valid measuring method exist or which are not generally defined (e.g. by a technical standard), are specified and explained.

2.2 Appearance

- Transparent, slightly coloured due to the material composition and production process
- Surface appearance: plane, slightly textured due to the production process

2.3 Mechanical Characteristics

2.3.1 Density

ρ approx. 2.6 g / cm³

2.3.2 Modulus of Elasticity

E approx. 93 × 10³ MPa

2.3.3 Poisson's Ratio

μ approx. 0.25

2.3.4 Bending Strength

The bending strength testing is to be accomplished according to DIN EN 1288 part 5 (R45).

$\bar{\sigma}_{bB}$ approx. 35 MPa

2.3.5 Impact Resistance

The impact resistance of ROBAX® depends on the kind of installation, the size and thickness of the panel, the kind of impact, the geometry of the panel and especially here on the drilled holes and their position on the ROBAX® panel.

Therefore information regarding the impact resistance can only be given with knowledge of the respective application (especially in combination with the technical standards regarding impact resistance that have to be met for single applications). Corresponding guideline values on request.

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2.4 Thermal Characteristics

2.4.1 Coefficient of Mean Linear Expansion

$$\alpha_{(20 - 700^{\circ}\text{C})} \quad (0 \pm 0.5) \times 10^{-6} / \text{K}$$

2.4.2 Mean Specific Thermal Capacity

$$c_{p(20 - 100^{\circ}\text{C})} \quad \text{approx. } 0.8 \times 10^3 \text{ J / (kg} \cdot \text{K)}$$

2.4.3 Thermal Conductivity

$$\lambda_{(90^{\circ}\text{C})} \quad \text{approx. } 1.6 \text{ W / (m} \cdot \text{K)}$$

2.4.4 Resistance to Temperature Differences (RTD)

Resistance of the panel to temperature differences between heated zone and cold panel edge (room temperature).

No cracking due to thermal stress at $T_{\text{es, max}}^{1)} \leq 700^{\circ}\text{C}$

2.4.5 Thermal Shock Resistance

Resistance of the panel to thermal shock when the hot panel is quenched with cold water (room temperature).

No cracking due to thermal stress at $T_{\text{es, max}}^{1)} \leq 700^{\circ}\text{C}$

2.4.6 Temperature / Time Load Capacity (under consideration of items 2.4.4 and 2.4.5)

The temperature / time load capacity specifies the maximum permissible temperature for given load times for the fireplace panels, below which no cracking due to thermal stress occurs.

The value pairs specified in the following [table 2.1](#) are relevant to the practical use of the glass ceramic material as fireplace panel. The temperature values refer to the hottest point on the exterior side of the panel ($T_{\text{es, max}}$) because this temperature can be measured more easily and more reliably.

¹⁾ $T_{\text{es, max}}$: Maximum temperature on the exterior side of the panel, that means the reverse side of the heat source, at the hottest point

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Load temperature $T_{es, max}^{1)}$	Load time
560°C (1040°F)	5000 hr
610°C (1130°F)	1000 hr
660°C (1220°F)	100 hr
710°C (1310°F)	10 hr
760°C (1400°F)	5 hr

Table 2.1: Temperature / time load capacity for ROBAX® panels

Note:

For ROBAX® fireplace panels the temperature / time load capacity specified in table 2.1 must be maintained. It must be ensured that this temperature / time load capacity is not exceeded during use, to prevent cracking due to thermal stress.

The temperature / time load data for even temperature distributions within an entire glass ceramic panel (e.g. homogeneous heating conditions in a testing furnace) are given in [table 2.2](#). This data is to be seen purely as characteristic data for the glass ceramic material itself. It is not typical for use of the glass ceramic material as fireplace panels, which have a temperature distribution totally different from evenness. The temperatures refer to the homogeneous heating of the ROBAX® panel (T_{hom}).

Load temperature $T_{hom}^{2)}$	Load time
700°C (1292°F)	6000 hr
750°C (1382°F)	750 hr
775°C (1427°F)	275 hr
800°C (1472°F)	100 hr
825°C (1517°F)	35 hr

Table 2.2: Temperature / time load capacity for uniformly heated ROBAX® panels

¹⁾ $T_{es, max}$: Maximum temperature on the exterior side of the panel, that means the reverse side of the heat source, at the hottest point

²⁾ T_{hom} : Homogenous temperature, i.e. material temperature under homogeneous heating conditions

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2.5 Chemical Characteristics of Base Material

2.5.1 Acid Resistance

DIN 12116

at least class S3

2.5.2 Alkaline Resistance

based on ISO 695

at least class A2

2.5.3 Hydrolytic Class

DIN ISO 719

class HGB 1

2.5.4 Change of Surface due to Use

ROBAX® has a good resistance against chemical surface attack. In isolated cases and under special critical conditions, e.g. aggressive exhaust gases (acidification at high temperatures) changes of the surface may occur. For such applications practice tests have to be carried out before being used.

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3. General Dimensional Tolerances and Material Characteristics

The following describes characteristics which are valid for all four product groups (stock-size sheets, cut-to-size panels, round bent and angular bent panels). With regard to stock-size sheets all of the following characteristics (with exception of flatness, see item 4.1) refer to the net-size as agreed on with the customer.

3.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Thickness t $t = 3.0 / 4.0 / 5.0 \text{ mm}$	$\pm 0.2 \text{ mm}$

Table 3.1: Dimensional tolerances

3.2 Material Characteristics

Visual inspection in the normal installation position without visual aids and illumination of approx. 800 Lux when viewed from a minimum distance of 1 m.

The inspection shall be executed with a background in the colour of fireclay bricks:

Light ivory RAL-1015.

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3.2.1 Bubbles

Bubbles are gaseous inclusions within the glass ceramic material. Closed bubbles can appear as low-spots on the surface depending on their size and position within the glass. Open bubbles are open towards the panel surface and are not permissible if bigger than 1 mm. The production of material totally free of bubbles is not possible due to the production process. [Table 3.2](#) contains the permissible number of closed bubbles in dependence of their length and the panel size.

Characteristic's Length L [mm]	Panel Size A			
	$A \leq 20 \text{ dm}^2$	$20 \text{ dm}^2 < A \leq 40 \text{ dm}^2$	$40 \text{ dm}^2 < A \leq 80 \text{ dm}^2$	$80 \text{ dm}^2 < A \leq 150 \text{ dm}^2$
$L \leq 1.0$	unconsidered	unconsidered	unconsidered	unconsidered
$1.0 < L \leq 2.0$	2 ¹⁾	6 ¹⁾	12 ¹⁾	33
$2.0 < L \leq 4.0$	1 ¹⁾	2 ¹⁾	4 ¹⁾	20
$4.0 < L \leq 8.0$	0	0	0	13
$8.0 < L$	0	0	0	0

¹⁾ The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.2: Permissible number of closed bubbles per panel

3.2.2 Solid Inclusions and Stains

Solid inclusions are inhomogeneities within the glass ceramic material. Stains are deviations of the surface which are easily visible under normal inspection conditions. Both characteristics cannot be completely avoided due to the production process. [Table 3.3](#) contains the permissible number of solid inclusions and stains in dependence of their length and the panel size.

Characteristic's Length L [mm]	Panel Size A			
	$A \leq 20 \text{ dm}^2$	$20 \text{ dm}^2 < A \leq 40 \text{ dm}^2$	$40 \text{ dm}^2 < A \leq 80 \text{ dm}^2$	$80 \text{ dm}^2 < A \leq 150 \text{ dm}^2$
$L \leq 0.5$	unconsidered	unconsidered	unconsidered	unconsidered
$0.5 < L \leq 2.0$	0	3 ¹⁾	6 ¹⁾	30
$2.0 < L \leq 4.0$	0	0	1 ¹⁾	3
$4.0 < L$	0	0	0	0

¹⁾ The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.3: Permissible number of solid inclusions and stains per panel

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3.2.3 Scratches

The delivery of ROBAX® panels totally free of scratches is not possible due to technical reasons. It has to be distinguished between slight scratches (scratches not detectable with finger nail) and strong scratches (scratches detectable with finger nail). [Table 3.4](#) contains the permissible number of scratches in dependence of their length and the panel size.

Characteristic's Length L [mm]	Panel Size A			
	$A \leq 20 \text{ dm}^2$	$20 \text{ dm}^2 < A \leq 40 \text{ dm}^2$	$40 \text{ dm}^2 < A \leq 80 \text{ dm}^2$	$80 \text{ dm}^2 < A \leq 150 \text{ dm}^2$
Slight Scratches:				
$L \leq 10$	unconsidered	unconsidered	unconsidered	unconsidered
$10 < L$	1 ¹⁾	2 ¹⁾	4 ¹⁾	20
Strong Scratches:				
$L \leq 10$	1 ¹⁾	2 ¹⁾	4 ¹⁾	20
$10 < L$	0	0	0	0

¹⁾ The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.4: Permissible number of scratches per panel

3.2.4 Pits

ROBAX® panels may show pits. These pits must not be recognizable during a visual inspection according to the conditions for visual inspections as described in item 3.2.

3.2.5 Other Characteristics

If the panel - when inspected according to the conditions for visual inspections as described in item 3.2 - shows a number of defects which impair the aesthetic appearance SCHOTT and the customer will agree on limit values for the respective characteristics and, if necessary, limit samples will be defined.

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4. Stock-Size Sheets

Stock-size sheets are large-size glass ceramic panels without any further processing, especially without edge processing. They serve as base material for cut-to-size panels.

4.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Edge length of stock-size sheet Usable length: Usable width:	at least 1580 mm at least 840 mm
Flatness of stock-size sheet Flatness	$\leq 0.3 \% \times \text{measuring length}$ (Measuring length at least 500 mm)

Table 4.1: Dimensional tolerances for stock-size sheets

4.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

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5. Cut-to-Size Panels

5.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Edge length l $l \leq 500$ mm $l > 500$ mm Special designs (contour shapes)	± 1.0 mm ± 1.5 mm as per separate agreement
Corner radius r $r \leq 20$ mm $r > 20$ mm	± 1.5 mm ± 2.0 mm
Squareness of cut-to-size panels a (according to fig. 5.1) Edge length ≤ 500 mm Edge length > 500 mm	$a \leq 1.0$ mm $a \leq 1.5$ mm
Flatness of cut-to-size panels Flatness	$\leq 0.3\% \times D$ D : diagonal of cut-to-size panel
Drilled hole diameter d_H $4 \text{ mm} \leq d_H \leq 20 \text{ mm}$ $20 \text{ mm} < d_H \leq 60 \text{ mm}$	± 0.2 mm ± 0.5 mm
Position of drilled hole <ul style="list-style-type: none"> Deviation between drilled hole centre axis and panel centre axis Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm) 	± 1.5 mm ± 1.0 mm

Table 5.1: Dimensional tolerances for cut-to-size panels

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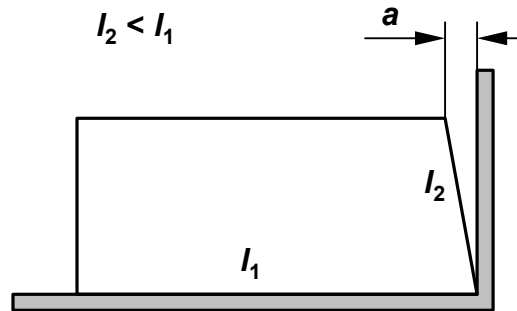


Fig. 5.1: Squareness measurement

5.2 Edge Finish

The edges of flat cut-to-size panels are processed according to DIN 1249, e.g. either arrised or round ground to size.

ROBAX® panels may show small chippings at the edges. The maximum permissible size of these chippings is 1.5 mm when measured from the outer edge of the panel.

ROBAX® panels with V-shaped edge defects are not permissible.

5.3 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

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6. Round Bent Panels

6.1 Dimensional and Form Tolerances

Characteristics / Areas / Location	Tolerance
Panel height h $h \leq 500$ mm $500 \text{ mm} < h \leq 600$ mm $600 \text{ mm} < h$	± 1.0 mm ± 1.5 mm Determination according to initial sample
Arc length l_A $l_A \leq 500$ mm $l_A > 500$ mm	± 1.5 mm ± 2.0 mm
Corner radius r $r \leq 20$ mm $r > 20$ mm	± 1.5 mm ± 2.0 mm
Sagging at panel edge s_h $h \leq 500$ mm $500 \text{ mm} < h \leq 600$ mm $600 \text{ mm} < h$	$s_h \leq 1.5$ mm $s_h \leq 2.0$ mm Determination according to initial sample
Drilled hole diameter d_H $4 \text{ mm} \leq d_H \leq 20$ mm $20 \text{ mm} < d_H \leq 60$ mm	± 0.2 mm ± 0.5 mm
Position of drilled hole <ul style="list-style-type: none"> • Deviation between drilled hole centre axis and panel centre axis • Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm) 	± 1.5 mm ± 1.0 mm

Table 6.1: Dimensional and form tolerances for round bent panels (see also [fig. 6.1](#))

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Table 6.2 contains the permissible overall torsion values of round bent panels.

	Panel Size A		
	$A \leq 20 \text{ dm}^2$	$20 \text{ dm}^2 < A \leq 40 \text{ dm}^2$	$40 \text{ dm}^2 < A$
Permissible overall torsion s_T [mm]	2.5	4	5

Table 6.2: Permissible overall torsion of round bent panels (see also fig. 6.1)

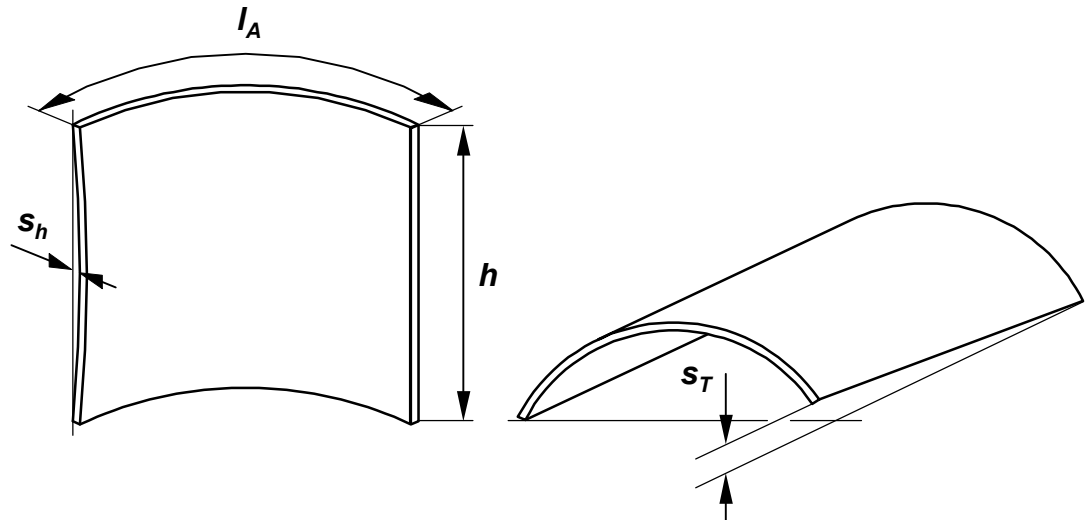


Fig. 6.1: Round bent ROBAX® panels

All geometric tolerances are specified by means of a two-dimensional enveloping contour. For testing the geometric tolerances a flat plastic gauge with a defined contour slot is used. The geometry of the contour slot is determined by the radius of curvature of the panel R_{soil} , by the arc length I_A and by the tolerance of the contour slot widths s_i , s_a (see fig. 6.2). If required the drawing of the contour slot gauge can be provided for the customer.

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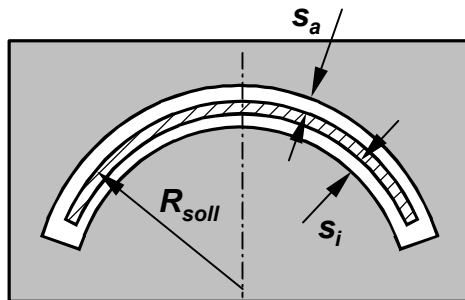


Fig. 6.2: Contour slot gauge geometry for round bent ROBAX® panels

The tolerances of the contour slot widths for round bent panels are given in [table 6.3](#).

Aperture angle α_B	Arc length l_A					
	$185 \text{ mm} < l_A \leq 400 \text{ mm}$		$400 \text{ mm} < l_A \leq 600 \text{ mm}$		$600 \text{ mm} < l_A \leq 1100 \text{ mm}$	
	s_i	s_a	s_i	s_a	s_i	s_a
$\alpha_B \leq 130^\circ$	1.0 mm	1.0 mm	1.25 mm	1.25 mm	1.25 mm	1.25 mm
$130^\circ < \alpha_B \leq 180^\circ$	1.25 mm	1.25 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm

Table 6.3: Tolerances of the contour slot widths s_i , s_a for round bent panels

The glass ceramic panel must easily fit into the contour slot gauge.

6.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

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7. Angular Bent Panels

7.1 Dimension and Form Tolerances

Characteristics / Areas / Location	Tolerance
Leg length l_1, l_3	± 2.0 mm
Middle section length l_2	± 1.0 mm
Panel height h $h \leq 500$ mm $500 \text{ mm} < h \leq 600$ mm $600 \text{ mm} < h$	± 1.0 mm ± 1.5 mm Determination according to initial sample
Corner radius r $r \leq 20$ mm $r > 20$ mm	± 1.5 mm ± 2.0 mm
Sagging at leg edge s_{l1}, s_{l3}	$s_{l1}, s_{l3} \leq 2.0$ mm
Sagging at middle section edge s_{l2}	$s_{l2} \leq 2.0$ mm
Sagging at panel edge s_h $h \leq 500$ mm $500 \text{ mm} < h \leq 600$ mm $600 \text{ mm} < h$	$s_h \leq 1.5$ mm $s_h \leq 2.0$ mm Determination according to initial sample
Drilled hole diameter d_H $4 \text{ mm} \leq d_H \leq 20$ mm $20 \text{ mm} < d_H \leq 60$ mm	± 0.2 mm ± 0.5 mm
Position of drilled hole <ul style="list-style-type: none"> Deviation between drilled hole centre axis and panel centre axis Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm) 	± 1.5 mm ± 1.0 mm

Table 7.1: Dimension and form tolerances for angular bent panels (see also [fig. 7.1](#))

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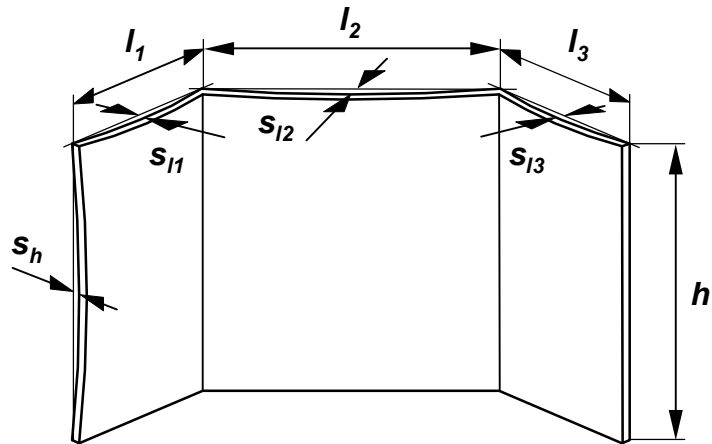


Fig. 7.1: Angular bent ROBAX® panels

Table 7.2 contains the permissible overall torsion values of angular bent panels.

	Panel Size A		
	$A \leq 20 \text{ dm}^2$	$20 \text{ dm}^2 < A \leq 40 \text{ dm}^2$	$40 \text{ dm}^2 < A$
Permissible overall torsion s_T [mm]	2.5	4	5

Table 7.2: Permissible overall torsion of angular bent panels (see also fig. 7.2)

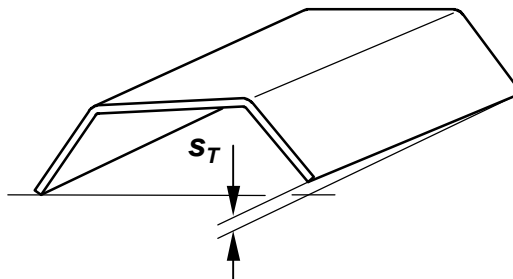


Fig. 7.2: Overall torsion of an angular bent ROBAX® panel

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All geometric tolerances are specified by means of a two-dimensional enveloping contour. For testing the geometric tolerances a flat plastic gauge with a defined contour slot is used. The geometry of the slot is determined by the edge lengths l_1 , l_2 , and l_3 , by the bending angle α_w and by the tolerances of the contour slot widths s_i , s_a (see [fig. 7.1, 7.2, 7.3 and 7.4](#)). If required the drawing of the contour slot gauge can be provided for the customer.

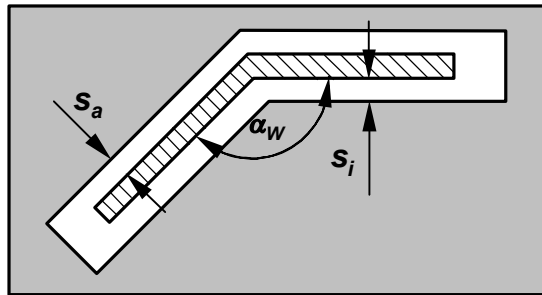


Fig. 7.3: Contour slot gauge geometry for single angular bent ROBAX® panels

The tolerances of the contour slot widths for single angular bent panels are given in [table 7.3](#).

Bending angle α_w	Sum of leg lengths L					
	180 mm < L ≤ 440 mm		440 mm < L ≤ 900 mm		900 mm < L ≤ 1300 mm	
	s_i	s_a	s_i	s_a	s_i	s_a
$90^\circ < \alpha_w \leq 160^\circ$	1.0 mm	1.0 mm	1.5 mm	1.5 mm	2.0 mm	2.0 mm

Table 7.3: Tolerances of the contour slot widths s_i , s_a for single angular bent panels

The glass ceramic panel must easily fit into the slot gauge.

ROBAX® Glass Ceramic Panels

Technical Delivery Specification TL 1 00 05 51 - 00

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The contour slot gauge geometry as shown in [fig. 7.4](#) is valid for double angular bent panels.

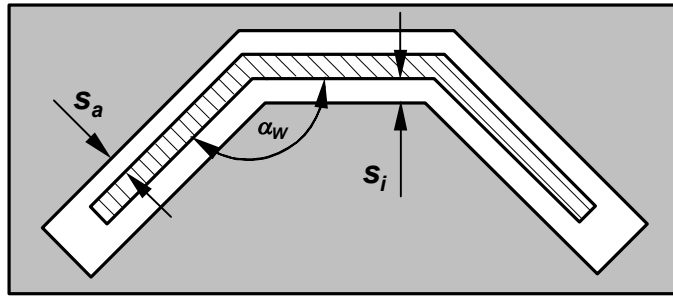


Abb. 7.4: Slot gauge geometry for double angular bent ROBAX® panels

The tolerances of the contour slot widths for double angular bent panels are given in [table 7.4](#):

Bending angle α_W	Longest leg length l_{max}					
	$30 \text{ mm} < l \leq 100 \text{ mm}$		$100 \text{ mm} < l \leq 200 \text{ mm}$		$200 \text{ mm} < l \leq 340 \text{ mm}$	
	s_i	s_a	s_i	s_a	s_i	s_a
$110^\circ < \alpha_W$	1.0 mm	1.0 mm	1.25 mm	1.25 mm	1.5 mm	1.5 mm

Table 7.4: Tolerances of the contour slot widths s_i , s_a for double angular bent panels

The glass ceramic panel must easily fit into the slot gauge.

7.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

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8. Transport, Storage and Handling

To avoid damage, it is necessary for the panels to be handled properly as well as transported and stored only vertically secured, and protected against touching each other by suitable intermediate layers (paper, cardboard, cork or PE foamfoils).

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9. Installation Guidelines

The same conditions apply to the installation and the handling of ROBAX® panels as are generally valid for handling glass and glass ceramic parts.

- The **different thermal expansion** between the various frame materials and the ROBAX® panel has to be taken into account for the complete construction. Furthermore the possible production tolerances of frame and panel have to be considered.
- For installation it is necessary to use a sufficiently **low distortion frame construction**. As a minimal distortion of the frame construction cannot be excluded a **temperature stable, permanently resilient gasket** (e.g. fibre glass cloth or mineral fibre cloth) is required in order to prevent any transfer of distortions from the frame construction onto the ROBAX® panel. Any direct contact between glass ceramics and metal has to be avoided.
- If for constructive reasons a pressing of the panel in the frame is required the **contact pressure must be applied uniformly (never at points only)** over the entire edge area of the panel.

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10. Procedures if Deviations Occur

10.1 Basic Action

Deviations should be handled in the most cost-effective manner for both partners. Deviations are estimated according to the state of the products at time of delivery. Changes in the material which occur during further processing of ROBAX® glass ceramic panels exclude warranty claims of the recipient against SCHOTT.

10.2 Obligation of Recipient to Provide Information

SCHOTT requires the following data for reporting, testing and evaluating deviations:

- SCHOTT order number
- Pallet voucher with production order number
- Warehouse unit number
- Delivery quantity affected
- Complaint quantity with article number
- Reasons for complaint
- Results of random sample tests

10.3 Recipient's Storage Obligation

All parts with characteristic values deviating from the specifications and complained about by the recipient must be stored by the recipient until final clarification of the facts and made available to SCHOTT upon request. If such parts are scrapped by the recipient without written authorization from SCHOTT or if they are no longer available for other reasons, all warranty rights regarding such parts shall be null and void.

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Basic/material

E-glass.

Description

The basic material consists of 6-9 micron E-glass fiber yarns which are texturized.

The product is inorganic, sterile, refractory, and contains no toxins or heavy metals. It is a knitted glass fiber packing – with or without core – made of E-glass.

It is a heavy packing, so you get a more stable packing, e.g. for wood-burning stove doors. The packing is suitable as a door seal in stoves and sealing flues.



Dimensions and technical data

Dimensions: Ø 3-50 mm

Length: 50/100 mm

Temperature: 550 °C

Colour: White / Antracit

Application: Packing/seal

Flammability: Inflammable

Basic/material

E-glass.

Description

The basic material consists of 6-9 micron E-glass fiber yarns which are texturized.

The product is inorganic, sterile, refractory, and contains no toxins or heavy metals.

A knitted fiberglass tape has a great packing surface – with less packing thickness. This makes the tape suitable for packing glass in stoves, where usually there is no room for a round seal.

A ladder tape is a knitted fiberglass tape with a ladder in the middle. That is, on the middle, there are only transverse strands.

This makes it particularly suitable for packing of the glass in the stove, as the tape packs on both sides simultaneously.

The packing is available with self-adhesive tape for easy installation.



Dimensions and technical data

Dimension: 8x2 mm - 25x3 mm

Length: 50 / 100 mm

Temperature: 550 °C

Colour: Antracit

Tape: Yes

Application: Packing / sealing

Flammability: Inflammable

INSULFRAX LTX BLANKET

Description

Insulfrax® LTX™ Blankets are the latest addition to the Insulfrax product family. Insulfrax LTX offers the same benefits as previous Insulfrax blankets, now with physical properties enhanced to improve both thermal performance and handling. These lightweight needled blankets combine innovative proprietary technology with Insulfrax proven performance to create the best low-biopersistent Insulfrax blanket available from Insulcon today. Insulfrax LTX blankets are manufactured from alkaline earth silicate (AES) wool, and provide effective solutions to a variety of thermal management challenges. The new Insulfrax LTX products can help customers reduce costs. The enhanced LTX fibre performance helps companies reduce their energy costs and meet increasingly strict carbon emission targets, without increasing the amount of insulation required. Alternatively, customers can save on material costs by using less insulation to achieve the same performance as standard AES blankets. Customers can save money by reducing their lining thickness up to 25%, freeing up valuable space in furnaces and ovens. Insulfrax LTX Blankets are completely inorganic and binder free with an improved, smoother surface finish. Insulfrax LTX Blankets retain their strength, flexibility and thermal properties in many working environments without the generation of smoke or fumes. These new blankets are less dusty, which makes handling and cutting the material easier, resulting in faster installation of the product onsite and, in some cases, reduced waste of material. Insulfrax LTX Blankets are also printed on the surface of the blanket, which makes installation tracking and inspection on the job site or in the fabrication shop easier. Available in a range of density and thickness combinations, Insulfrax LTX Blankets can be used in a wide variety of applications and are especially suited for use as high-temperature gaskets, wraps and heat shields.



General Characteristics

Insulfrax LTX Blanket products have the following outstanding characteristics:

- Exceptional insulating properties
- High temperature stability (up to 1200°C)
- Resistance to thermal shock
- High tensile strength & resiliency
- Lightweight
- Excellent flexibility
- Good acoustic properties

Typical Applications

Insulfrax LTX Blankets are the next generation of low biopersistent Insulfrax fiber and the product of choice for a wide range of applications in a number of industries including:

Appliances

- Residential self-cleaning ovens
- High-temperature commercial cooking appliances

Hearth Products

- Chimney Insulation

INSULFRAX LTX BLANKET

Primary Metals

- Expansion joint seals
- Aluminium transfer ladle covers
- Backup insulation for dense refractory linings
- Backup insulation for Fiberfrax® or Isofrax® linings
- Maintenance blanket
- Heat shields

Metals Processing

- Stress relieving blankets
- Seals and gaskets

Petrochemical/Power

- Reusable insulating pads
- External boiler and duct insulation

Ceramic and Glass

- Glass tank crown insulation
- Expansion joints
- Carbon baking furnace covers

Passive fire protection

Exhaust Insulation and Heat Shields

Typical Product Parameters

		Insulfrax LTX Blanket			
<i>Typical Chemical Analysis (wt. %)</i>					
SiO ₂		61.0 – 67.0			
CaO		27.0 – 33.0			
MgO		2.5 – 6.5			
Al ₂ O ₃		<1.0			
Fe ₂ O ₃		<0.6			
<i>Physical Properties</i>					
Colour		White			
Classification Temperature (C°)*		1200			
Use Limit (C°)*		1100			
Melting Point (C°)		>1330			
Mean Fibre Diameter (microns)		4.0			
<i>Permanent Linear Shrinkage (%) 24 hour soak EN 1094-1</i>					
1200°C		1.0			
Density (kg/m³)		64	96	128	160
<i>Thermal Conductivity (W/mK) – ASTM C201</i>					
Mean Temp.					
200°C		0.06	0.06	0.05	0.05
400°C		0.11	0.09	0.08	0.08
600°C		0.17	0.14	0.12	0.11
800°C		0.26	0.20	0.18	0.15
1000°C		0.38	0.29	0.25	0.21
<i>Tensile Strength (kPa)</i>					
		45	65	85	100

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 Effective: 22012018/AJ/an
 supersedes: ss None
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INSULFRAX LTX BLANKET

* The maximum continuous use limit temperature for these products depends upon operating and application conditions, and also the engineered design of the insulation lining. For additional information and support regarding product performance or to identify the recommended product for your application, please contact your nearest Insulfrax Application Engineering office.

Data shown is based on average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Availability

Thickness (mm)	Density (kg/m ³)				Roll Length (m)
	64	96	128	160	
6		*	✓		22.00
10		*	*		18.30
13		✓	✓	*	14.64
19	*	✓	✓	*	10.00
25	✓	✓	✓	✓	7.32
38	*	✓	✓	*	5.00
50	✓	✓	✓	✓	3.66

Standard roll width is 610mm.

Products in the table above listed with a checkmark are standard items.

Products marked with an asterisk (*) are not standard items but are available on request and may be subject to minimum order requirements. Other thicknesses, sizes and densities (e.g. 80 kg/m³) are available on request subject to minimum order requirements. Versions with aluminium foil and other coverings are also available.

V-1100 (600) Vermiculite insulating slabs

for hot-face and back-up insulation - up to 1100°C (2012°F)



Maximum service temperature		
	°C	1100
	°F	2012
Bulk density, dry		
	kg/m ³	600
	lbs/cu.ft.	37.5
Compressive strength (EN 1094-5: 1995) @ room temperature		
	MPa	4.2
	lbs/sq.in.	609
Modulus of rupture (EN 993-6: 1995)		
	MPa	1.6
	lbs/sq.in.	232
Total porosity (EN 1094-4: 1995)		
	%	76
Specific heat		
	kJ/(kg×K)	0.94
	BTU/(lb×°F)	0.224
Coefficient of reversible thermal expansion (BS 1902: section 5.3: 1990) @ 20°C-750°C (68°F-1382°F)		
	K ⁻¹	11×10 ⁻⁶
	°F ⁻¹	6.1×10 ⁻⁶
Resistance to thermal shock (EN 993-11: 1998) heating to 950°C (1742°F)		
	cycles	>10
Linear reheat shrinkage (EN 1094-6: 1999) @ 1000°C		
	%	1.0
@ 1100°C		
	%	
Pyrometric cone equivalent (ASTM C24-89 ORTON cones)		
	°C	1300
	°F	2372
Thermal conductivity (ASTM C-182)		
mean temp. @ 200°C	W/(m×K)	0.15
mean temp. @ 400°C	W/(m×K)	0.16
mean temp. @ 600°C	W/(m×K)	0.19
mean temp. @ 800°C	W/(m×K)	-
mean temp. @ 392°F	BTU/(sq.ft.×h×°F/in.)	1.04
mean temp. @ 752°F	BTU/(sq.ft.×h×°F/in.)	1.11
mean temp. @ 1112°F	BTU/(sq.ft.×h×°F/in.)	1.32
mean temp. @ 1472°F	BTU/(sq.ft.×h×°F/in.)	-
Chemical analysis, typical		
	%	
Silica	SiO ₂	47
Titanium dioxide	TiO ₂	0.5
Ferric oxide	Fe ₂ O ₃	4
Alumina	Al ₂ O ₃	7
Magnesium oxide	MgO	21
Calcium oxide	CaO	2
Sodium oxide	Na ₂ O	0.5
Potassium oxide	K ₂ O	11
Loss on ignition 1025°C (1877°F)	LOI	7
Colour		sand

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Data are average results of tests conducted under standard procedures and are subject to variation. Data contained in this data sheet are supplied in good faith as a technical service and are subject to change without notice. Misprint and errors excepted.

Skamol A/S is DS/EN ISO 9001 certified.

Annex 25

Title: Labels

Pages total: 2, excl this cover page

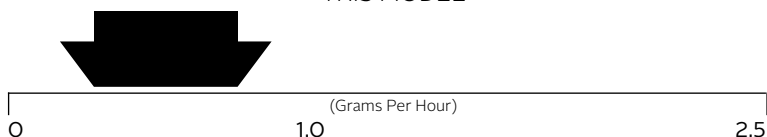
Manufactured by: Morsø
Model: 2B Standard 2020

U.S. ENVIRONMENTAL PROTECTION AGENCY

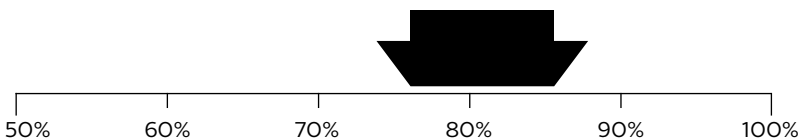
Certified to comply with 2020 particulate emission standards using cord wood.

SMOKE

THIS MODEL



EFFICIENCY



Particulate emission using ASTM E3053-17 cordwood test method:

Emission
0.55 g/h

Wood heaters with higher efficiencies cost less to operate.

HEAT OUTPUT
6,959 to 25,299 Btu/Hr

Use this to choose the right size appliance for your needs.
ASK DEALER FOR HELP

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

Annex 26

Title: Pictures of Morsø 2B Standard 2020

Pages total: 2, excl this cover page





Annex 27

Title: Manuals

Pages total: 26, excl this cover page

morsø



By appointment to The Royal Danish Court

morsø

Installation and Operating Instructions

Morsø 2B Standard

For use in North America



Save these instructions

MORSØ JERNSTØBERI A/S · DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Enjoy your new Morsø stove!

We congratulate you on your choice of a Morsø stove. Morsø has been producing some of the world's best stoves since 1853. If you follow this installation- and operating instruction carefully, we can assure you many years of warmth and pleasure.

Contents		
1.0	Installation of your Morsø stove	Page no.
1.1	Unpacking the stove	5
1.2	Checking loose parts in the stove	5
1.3	The chimney / flue system	7
1.4	Flue connection	8
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3.4	Leaving the stove for extended periods	20
3.5	Parts diagram for model Morsø 2B Standard	21
3.6	Parts list for model Morsø 2B Standard	22

Read this entire manual before you install and use your new room heater. If this room heater is not properly installed, a house fire may result. To reduce the risk of fire, follow the installation instructions. Failure to follow instructions may result in property damage, bodily injury, or even death.

Contact local building officials about restrictions and installation inspection requirements in your area.

Save these instructions

Optional Accessories

A wide range of accessories (such as handling gloves, fireside tools, glass cleaner and heat-proof paint) are available for use with your Morsø stove. They help with day-to-day running and maintenance. Contact your Morsø dealer for more information.

The Morsø 2B Standard 2020 have been tested by OMNI-Test Laboratories, Inc. The test standards are UL-1482-2012 (R2015) for the United States and ULC-S627-00 for Canada.



The stove is listed for burning wood only. Do not burn other fuels.

U.S. ENVIRONMENTAL PROTECTION AGENCY. Certified to comply with 2020 particulate emission standards using cord wood.

Average particulate emission using ASTM E3053-17 cord wood test method is 0.55 g/h. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 6,959 to 25,299 Btu/hr. This appliance was determined to have an average higher heating efficiency value of 80.2% when tested in accordance with CSA B415.1

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.



Cast iron

Cast iron is a live material. There are no two ovens that are identical. This is partly due to the tolerances of the casting process, partly because the ovens are a work of craftsmanship. Minor unevennesses may also occur in the cast iron surface.

1.0 Installation of your Morsø stove

Installation of woodburning stoves must be safe and legal.

If your Morsø stove is not installed correctly, it may cause a house fire. To reduce the risk of fire, the installation instructions must be followed carefully. Contact the local building officials about restrictions and installation inspection in your area.

Before you start installing your stove, make sure that:

- The stove and chimney connection are placed far enough from combustible materials to meet all clearance requirements.
- The floor protection must be adequate and must be made correctly according to the requirements.

All necessary approvals are needed from the local building officials.

The data plate, which is located on the back of the stove, provides information regarding safety testing information, name of certified testing laboratory, and installation requirements.

Installation requirements vary in different districts, and the local building officials have the final authorization to approve your installation. You should discuss the installation with them before beginning. Please ask your dealer for further information.

Do not connect to any air distribution duct or system.

Important: If the installation instructions are not followed carefully, it may cause dangerous situations like chimney - and house fires. Follow the instructions carefully and do not deviate from them as it may cause injuries to people or property.

1.1 Unpacking the stove

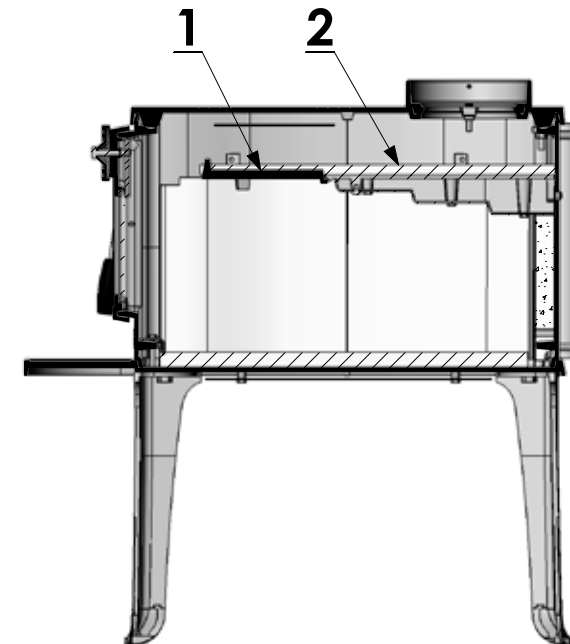
2B Standard: After removing the outer packaging, flatten it and lay onto the floor close to the stove; this can then act as protective work surface during the assembly process.

Next, remove the legs and bolts from inside the stove. Gently lay the stove onto its back and unscrew it from the wooden pallet. Using the bolts supplied, now screw the legs into position on the underside of the base. The stove should now be lifted and moved into the upright position, avoiding excess load on the back legs. Do not use the bolts used for securing the fire chamber to the wooden pallet.

1.2 Checking loose parts in the stove

After unpacking, check that the fire bricks are firmly in position and have not shifted in transit. Check also that the air control works freely.

Before starting the initial fire, make sure that the baffle (1) and insulation (2) over the baffle are placed correctly, as shown on the images below.



How to fit the Vertical Baffle

Lead the vertical baffle through the door as shown below (picture 1 & 2). Place the baffle into the right position (picture 3 & 4). The baffle insulation is placed on the baffle.



Standard Accessories

A Morsø glove and ceramic flue connection gasket are standard accessories that usually can be found in the ashpan or firebox area.

1.3 The chimney / flue system

Note that the flue system must be independently secured and must not rely on the stove for support.

The stove must not be connected to a chimney flue serving any other appliance. (Several flues may run up a single chimney stack; use one flueway per appliance).

Use a residential type masonry or listed type HT factory-built chimney.

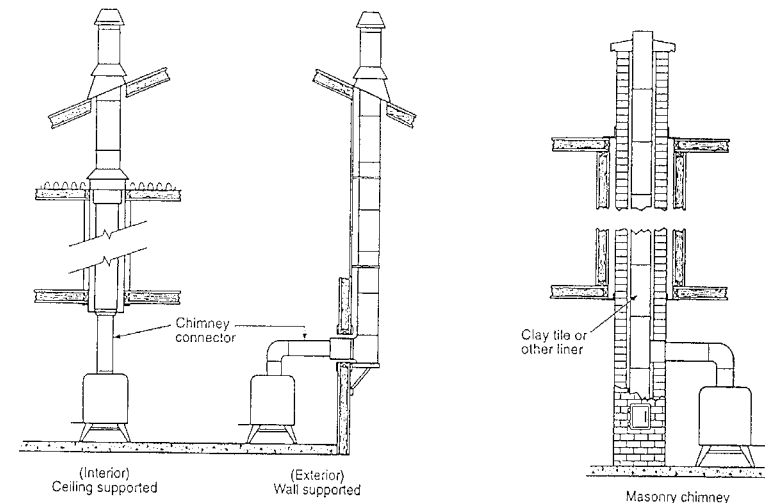
High Temperature (H.T.) Chimney Standard UL-103-1985 (2100° F.) or a code-approved masonry chimney with flue liner for the USA, and High Temperature (650°C) Standard ULC S-629 for Canada.

The internal dimensions of the chimney connector and chimney must not be less than 6 inches diameter (or equivalent cross section), and should not be significantly larger than this. Too large a section will tend to allow the flue gases to cool excessively, causing sluggishness or unpredictability in the stove's performance.

We recommend the length of the chimney system should be at least 16 feet (not required) above the stove in normal domestic situations, measured from the flue collar to the top of the chimney.

Local conditions like for example - roof constructions, large trees nearby and high altitude, may influence the chimney draft and height. Therefore, contact the local professional chimney sweep or your Morsø dealer.

Typical Factory-Built or Masonry Chimney Installations



1.4 Flue Connection

A flue collar is placed in the firebox area.

Use a 24 MSG black or blue chimney connector or listed double wall chimney connector. Refer to local codes and the chimney manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. Remember to secure the chimney connector with a minimum of three screws to the product and to each adjoining section. Position the stove and connect to the flue system.

Wear gloves and protective eyewear when drilling, cutting or joining sections of chimney connector.

1.5 Connection to the existing chimney

A chimney connector is the double-wall or single-wall pipe that connects the stove to the chimney. The chimney itself is the masonry or prefabricated structure that encloses the flue. Chimney connectors are used only to connect the stove to the chimney.

Double-wall connectors must be tested and listed for use with solid-fuel burning appliances. Single-wall connectors should be made of 24 gauge or heavier gauge steel. Do not use galvanized connector; it cannot withstand the high-temperatures that smoke and exhaust gases can reach, and may release toxic fumes under high heat. The connector must be 6 inches (150mm) in diameter.

If possible, do not pass the chimney connector through a combustible wall or ceiling. If passage through a combustible wall is unavoidable, refer to the sections on Wall Pass-Throughs. Do not pass the connector through an attic, a closet or similar concealed space when installing the chimney connectors.

It is important to keep the flue gases moving smoothly in the right direction. Do not vent into a large void at this location; rather form one continuous section all the way up. Use mild bends (e.g. 45° vs. 90°) rather than sharp angles where a change of direction is required. All parts of the venting must be accessible for cleaning purposes.

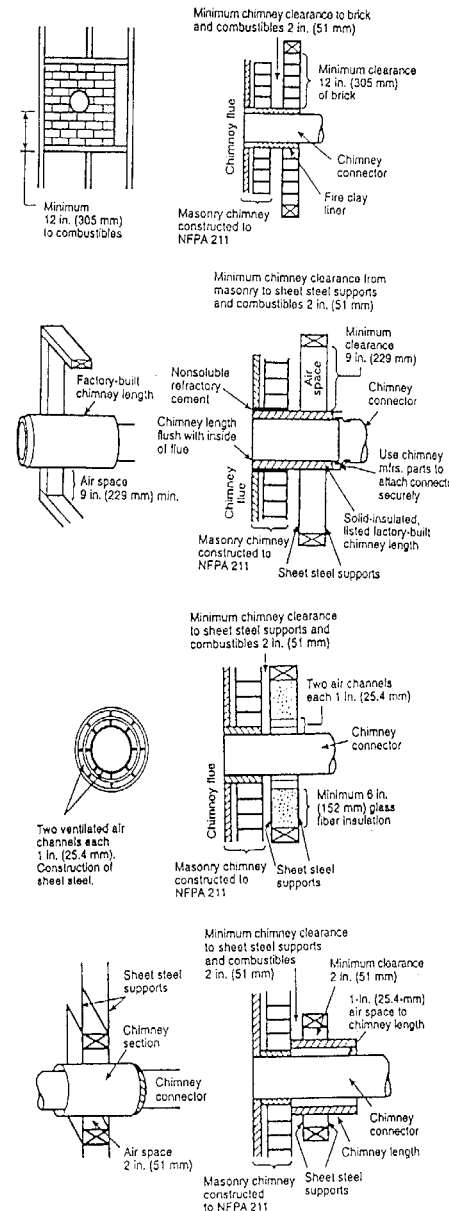
In horizontal runs of chimney, maintain a distance of 18 inches from the ceiling. Keep it as short and direct as possible, with no more than two 90 degree turns. Slope horizontal runs of connector upward 1/4 inch per foot (20 mm per metre) going from the stove toward the chimney. The recommended maximum length of a horizontal run is 3 feet (1 metre), and the total length should be no longer than 8 feet (2.5 metres).

Information on assembling and installing connectors is provided by the manufacturer's instructions exactly as you assemble the connector and attach it to the stove and chimney.

Be sure the installed stove and chimney connector are correct distances from near by combustible materials. See the clearance paragraph page 11.

Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365.

Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



- A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.
- B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.
- C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.
- D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

1.6 Positioning the stove

Distance to walls and lintel

When the stove is positioned near combustible materials, observe all current local and national building regulations with regards to clearances. Whatever regulations apply to your area, do not in any case install the stove within 8 inches of combustible materials around the sides or 16 inches above the top of the stove (fireplace installations require greater clearances above the stove - see below in the clearance chart). These distances may need to be increased if the materials are sensitive to heat. Note also that wall paper and other decorative materials may become detached with the effects of heat and care should be taken to ensure that they do not fall towards the stove in such an event.

When the stove is positioned near non-combustible materials, a gap of 4 inches or more is recommended for cleaning purposes and to ensure that heat circulates around the stove and out into the room.

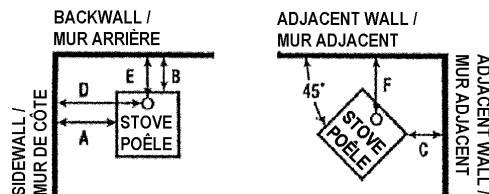
Clearance requirements for 2B Standard without shields (Singlewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (SINGLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	26"	26" (660 mm)
B. Backwall to unit	16"	16" (406 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	29"	29" (737 mm)
E. Backwall to connector	18"	18" (457 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

Clearance requirements for 2B Standard with Convection shields (Singlewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (SINGLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	26"	26" (660 mm)
B. Backwall to unit	16"	16" (406 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	26"	26" (606 mm)
E. Backwall to connector	23"	23" (583 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

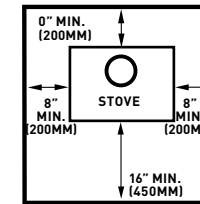
MINIMUM CLEARANCES TO COMBUSTIBLES:
DEGAGEMENTS MINIMAUX AUX MATERIAUX COMBUSTIBLES:



Clearance requirements for 2B Standard with & without shields (Doublewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (DOUBLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	20"	20" (508 mm)
B. Backwall to unit	12"	12" (305 mm)
C. Cornerwall to unit	16"	16" (406 mm)
D. Sidewall to connector	26"	26" (660 mm)
E. Backwall to connector	14"	14" (356 mm)
F. Cornerwall to connector	19"	19" (483 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

FLOOR PROTECTION REQUIREMENTS



FLOOR PROTECTOR MUST BE NON-COMBUSTIBLE MATERIAL. IT MUST EXTEND BENEATH HEATER, AND TO THE FRONT / SIDES / REAR AS INDICATED

Floor protection requirements	Non-combustible materials beneath stove	
	USA	Canada
A. Extending distance, back	-	200 mm
B. Extending distance, right side	6"	200 mm
C. Extending distance, left side	6"	200 mm
D. Extending distance, front	16"	450 mm

In the US, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 16" to the front and 8" to the sides of the fuel loading door and ash removal openings. In Canada, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 450 mm.(16") to any side with a door and 200 mm.(8") beyond the appliance on the other sides.

Distance to furniture

The recommended minimum distance from stove to furniture is 30 inches. Note that some furniture is more easily affected by heat and may need to be moved to a greater distance. This is your responsibility.

In addition other combustible materials, away from the stove. In general, a distance of 30 inches must be maintained between the stove and moveable combustible item such as drying clothes, newspapers, firewood etc.

DO NOT INSTALL IN A MOBILE HOME

Note:

Acid Protection

If acid-washing the masonry around the stove, protect the stove surface with an acid-proof cover.

Fresh Air Inlet

Unless there is deemed to be sufficient ambient leakage of air into the room via doorways, windows and the like, a dedicated fresh air inlet will be needed. This inlet should have 2 square inches (1250 square mm) of free air space. This is particularly important where the room is well sealed, or where an extractor hood or ventilation system disturbs the natural air pressure. Such an inlet should not be on a wall that is usually subject to negative pressure from normal wind pattern. Avoid placing the inlet directly across the room from the stove, thus causing a cold air draft.

2.0 Operation

2.1 Before you start firing

For use with solid wood fuel only. Do not overfire, if heater or chimney connector glows you are overfiring. Inspect and clean chimney frequently. Under certain conditions of use creosote buildup may occur rapidly. Because of risk of smoke and flame spillage, operate only with door fully closed.

CAUTION:

Hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.

DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE

DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS

DO NOT USE A GRATE, ANDIRONS, OR OTHER WAYS OF ELEVATING THE FIRE - BUILD FIRE DIRECTLY ON HEARTH.

DO NOT USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER OR FLUID OR SIMILAR LIQUIDS TO START OR FRESHEN UP A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS AWAY FROM THE HEATER WHILE IT IS IN USE

Choosing your fuel

All types of natural wood can be burned on your stove, but they must be well-seasoned and dry. Once the wood is cut to length, it should be split down middle - to suit the dimensions given below - to allow moisture to evaporate. Cut the wood to a length of max 12 inches (30 cm) and approx. 3 to 3,5 inches (7-8 cm) in section. If you can weigh your wood, aim for around 2 lbs. For correct combustion and heat output, wood fuel should contain no more than 20% moisture; this can easily be checked by using the Morsø Moisture Meter (part # 62929900).

To naturally season wood fuel, stack and store it under cover in an airy location where fresh air can move through each piece. Some soft woods may take as little as one good summer to season whereas harder woods such as oak, maple, and elm may require seasoning up to 18 months. Avoid overly dry wood that is gray in color as under certain conditions it can cause performance problems, such as back-puffing and sluggishness. Well seasoned wood will be light to hold and will show signs of cracking from the center-out in the ends. If your wood spits or sizzles when burnt, and your stove's door glass persistently mists up, your wood is not properly seasoned. Never use drift wood (from the sea), whose salt content may cause corrosion, nor construction wood that may have been impregnated with chemicals.

To optimize efficiency:

Burning wet wood has a negative impact on efficiency

CAUTION Do not place fuel within the installation clearances for the stove or within the space required for loading fuel and ash removal.

Starting the First Fire

The initial fire should be small, so that the stove paint can cure and the main plates of the stove can settle into position. Some fumes will be given off by the paint. Ventilate the room during this phase.

The setting of the air control, lighting techniques and loading intervals will depend on chimney draft, the fuel used, the heat required and so on. Some basic techniques are outlined below.

In principle

Your stove is fitted with Primary and Secondary air inlets. Primary Air is controlled using the spinner on the door. Open the spinner will allow a supply of preheated air to enter the firebox via the 'airwash' system situated inside the stove and above the glass.

The secondary air is injected into the flue gases above the fire resulting in a cleaner, more efficient combustion process. The supply of secondary air is fixed open and is not adjustable.

For extra safety, your stove has been fitted with a removable handle on the frontdoor.

2.2 Lighting and loading intervals

When first lighting the stove, a large volume of air is needed. When the stove is cold, you should leave the door open an inch or two for the first few minutes and open the primary air supply completely. While the door is open, do not leave the stove unattended.

To form a reasonable bed of ash on the floor of the stove, you should use 2-4 pounds of dry kindling at the initial lighting. If possible, maintain a 1-1.5 inch (2-3 cm) layer of ash on the floor of the combustion chamber for added insulation.

1. We recommend using the "top-down" method to light your wood-burning stove. It is the most environmentally-friendly method of lighting. Use two firelighters and approx. 2-4 lbs of dry kindling sticks to quickly create a glowing layer of wood. Place the firelighters directly under the top layer of kindling sticks. This minimizes soot formation on the glass. Soot formation on the glass is often caused by too vigorous burning in contact with cold surfaces. If you avoid the formation of soot when lighting the fire and build up a layer of hot embers, you will have minimal soot formation when getting the fire burning again later.



2. The air supply must be fully open.

3. Light the fire.



4. After lighting, partially close the door, leaving it open an inch or two to allow in plenty of combustion air.

4. When the chimney is warm after about 5-10 minutes, the frontdoor should be closed. A suitable layer of ember will be formed after about 15-20 minutes.



5. When ready to reload, use a poker to spread the ember across the firebox floor, bringing plenty towards the front of the stove.



6. Refuelling of your stove should be done while there are still glowing embers in the bed. Spread the embers across the bottom, but concentrated mostly towards the front of the stove. We recommend using fuel load with a weight of 4 lbs (2 pieces) and up to 7 lbs (5 pieces).

Always keep the fuel load beneath the lowest secondary air nozzles. The space in front of and above the lowest air nozzles is reserved for volatile gas combustion only.

When refuelling your stove, it is recommended that you open the stove door gently for the first 1-2", then wait for a few seconds for the pressure in the flue to equalise; you are now safe to proceed and open it all the way. By using this technique smoke spillage can be eliminated particularly in poor chimney draft conditions. The stove door should not be opened when the stove is being fired vigorously.



7. Close the frontdoor. Leave the primary air supply fully open. The new fuel will ignite in a minute or two

8. After a few minutes, adjust the primary air supply to suit your heating requirements.

9. For refueling, add a layer of wood while there are still plenty of live embers, Repeat steps 5-8.



This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

Warning: Fireplace stoves must never be left unattended with the door open. If the door is left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke. We recommend that you fit a smoke detector in the room where the stove is installed.

DO NOT OVERFIRE THIS HEATER. Overfiring may cause a house fire, or can result in permanent damage to the stove. If any part of the stove glows, you are overfiring.

The maximum recommended weight of wood fuel per load is 3,5 kg/7 lbs (approx 5 split logs).

Under normal firing, the average flue temperature in the stove pipe, measured 20 cm above the stove, is approx. 300° C (550°F). The maximum flue temperature in the stove pipe must not exceed 450° C (750°F). If the flue temperature exceeds 450° C (750°F), it is considered as over firing and may cause premature wear and tear of the stove.

To help gauge the correct running temperature of your stove, we recommend you use the Morsø Flue Gas Thermometer (part No. 62901200). The Flue Gas Thermometer magnetically attaches onto the stove pipe approx 20 cm (8") above the stove's top plate and measures the surface temperature of the stove pipe. Please see your authorized Morsø Dealer for availability.

Draft conditions

If smoke or fumes come out of your stove when lighting up and reloading, or if the fire simply will not respond, a poor draft is almost certainly to blame. (In a very few cases, there may be insufficient fresh air getting into the room - see installation advice above). Take advice from your stove supplier on how best to upgrade your flue system to improve draft.

Rules of woodburning

If you want less heat, put fewer logs on the stove and reduce the amount of air. It is still important to maintain a good layer of embers.

Less heat - less wood - less air

Greater heat - more wood - more air

Soot deposits will settle on the glass if the stove is run too slowly or if your wood is not well seasoned.

Carbon monoxide detectors

It is required in some jurisdictions to install smoke and carbon monoxide detectors where heaters are installed. Install at least one smoke detector on each floor of your home to ensure your safety. It should be located away from the wood appliance and close to the sleeping areas. Locating a smoke detector too close to a wood appliance can cause the smoke detector alarm to sound if a puff of smoke is emitted while the wood appliance door is open during reloading. Follow the smoke detector manufacturers placement, installation, and maintenance instructions

3.0 Maintenance

When performing maintenance on your stove, always protect yourself, using safety goggles and gloves

3.1 Exterior Maintenance

The stove surface is painted with heat-resistant Senotherm paint. It is best kept clean by vacuuming with a soft brush attachment or by wiping with a lint-free cloth.

Over a period of time, the painted surface may become slightly grey. A can of Morsø touch-up spray paint should be available from your stove supplier. This can be applied - in accordance with the instructions - in just a few minutes. When first firing after touching up, the stove will give off a slight smell as the paint cures. Make sure to ventilate the room well during this phase.

3.2 Internal maintenance

Glass

If the stove is generally run at the correct temperatures, there should be little or no dirt on the glass. If dirt does settle during lighting, most will burn off as temperatures increase. For heavier deposits that will not burn off, use Morsø glass cleaner, applied when the glass is cold, in accordance with the instructions. Never use abrasive cleaners on the glass surface.

Reasons for dirty glass

- Fuel too wet
- Logs too large or not split
- Combustion temperatures too low

Do not clean the glass while hot

Replace broken glass immediately.

Do not operate your stove if the glass in the door is damaged.

If you need to replace the glass, it should be replaced with the high temperature ceramic glass supplied by Morsø, contact your Morsø dealer.

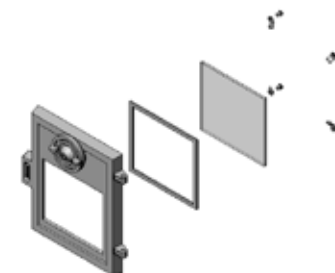
Installing the glass

Never install the glass when the stove is in function.

Ceramic glass replacement

Ceramic glass cannot be recycled because it has a higher melting point than ordinary glass. If ceramic glass is mixed with ordinary glass, the raw material is spoiled, and the reclaiming process may be halted. Take care that the ovenproof glass does not end up among ordinary recycled waste. That will be a great benefit to the environment.

Note: Should be handed in to a recycling station as ceramic glass.



1. Lift the door off the hinges and place it face down on a sheet of cardboard or other non-abrasive fabric.
2. Unscrew the 4 bolts that secure the glass. (In the event that a bolt sheers off when being unscrewed, remove the remaining body of the bolt by drilling down its centre with 1/8 inch high speed steel drill bit. Smaller drill bits may be successful, but do not use a larger bit. Make sure the bit stays away from the edges of the bolt - this may damage the thread in the cast iron).
3. Remove the old ceramic gaskets and clean up the surface underneath with wire wool or emery paper to remove loose particles.
4. Place the new gasket material in position around the perimeter of the window area, making sure to pinch them to the length in such a way that they make a continuous seal. Leave no gaps.
5. Place the new glass in position on the strips and screw home the fresh bolts and fitting by hand.
6. Finally, give each of the bolts an extra half turn or so. The glass should held tight enough by that cleaning will not dislodge it. Do not over-tighten the bolts as this may put excessive pressure on the glass, resulting in cracking - important!

To reduce the risk of breaking the glass, avoid striking the glass or slamming the door.

Internal service parts

The flame-path equipment - consisting of the ashpan, grate, firebricks, Cast iron fire plates, glass, baffle and flue collar - are subject to the extremes of heat produced by the fire. From time to time, one or other of these parts may need replacing as a matter of routine maintenance.

Stone replacement

When replacing the stones, unscrew at the rear of the stove the heat reflector, which is mounted with 4 screws. This provides access to the 2 bolts that hold the smoke baffle in place. Remove these bolts so that the smoke baffle inside the stove can be raised. Raise the smoke baffle so that the old stones can be removed from the stove and the new ones can be installed. The side stones are placed in the grooves in the vermiculite bottom plate. Once the stones have been properly put into place, lower the smoke baffle down onto the stones and re-bolt it securely to the cast rear of the stove. Finally, reinstall the rear heat reflector with its 4 screws.

NOTE: The flame-path equipment, the ceramic rope and the paint finish are not covered by guarantee.

All of these service parts can be bought from your Morsø dealer, and we recommend that damaged parts are replaced as soon as possible to avoid collateral damage. Should the baffle be distorted by an overfire, the stove will still function, although its efficiency may be compromised. Replace it as soon as possible.

Reasons for fast internal wear and tear

- Persistent heavy firing
- Soot and ashes left to accumulate

Gasket

The gasket around the perimeter of the door may harden over a period of time. It should be replaced if it becomes difficult to close the doors or if air starts to leak in around the perimeter of the doors, causing the fire to become a little less controllable. A Morsø rope gasket kit is available from your stove supplier.

3.3 Cleaning the Stove and the Flue

Check for soot above the baffle plate and around the flue outlet every month or so to start with. If the stove suddenly becomes sluggish, check for a soot fall around the flue collar or in the flue/chimney.

The chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Clean the flue/chimney - all the way from the stove to the flue terminal point above the house. A good routine is to clean the flue after each heating season in any case, and inspect prior to the season to ensure that bird's nests or other blockages have not occurred during the off season.

Ash disposal

Empty the ashpan on a daily basis or as needed. Ash allowed to build up towards the underside of the grate will trap heat and could cause premature failure of the grate.

Empty the ashpan according to this procedure:

Open the front door, and use a shovel.

Dispose the ash in a metal container with a tight fitting lid.

The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Caution:

Never empty a stove in operation.

Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

Creosote - formation and need for removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. When burning wood, the chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Chimney sweeping

Inspect the system regularly during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.

Clean the chimney using a brush the same size and shape as the flue liner. Run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.

Clean the chimney connector disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Morsø Dealer or a professional chimney sweep.

If you do experience a chimney fire, act promptly and:

1. Close the air control.
2. Get everyone out of the house.
3. Call the Fire Department.

Annual maintenance

Before the heating season, perform a thorough cleaning, inspection and repair: Thoroughly clean the chimney and chimney connector.

Inspect the chimney for damage and deterioration. Replace weak sections of prefabricated chimney. Have a mason make repairs to a masonry chimney.

Inspect the chimney connector and replace any damaged sections.

Check gasketing for wear or compression, and replace if necessary.

Check the glass for cracking; replace if needed.

Check door and handle for tightness. Adjust if needed.

ALWAYS USE ORIGINAL MORSØ SPAREPARTS

3.4 Leaving the stove for extended periods

Important:

If the stove is to be left unused for any period of time, clean it out thoroughly and leave the air control slightly open to allow airflow. Make sure that the flue does not allow rainwater to come anywhere near the stove; install a chimney cap, but do not block off the flue completely.

These measures should ensure there is a slight movement of air through the stove, and that the body of the stove remains dry, right into the corners.

Any ash left within an unfired stove can attract moisture like blotting paper. If moisture is allowed to settle within the stove, rust will form. Rust expands as it takes a grip. This can lead to undue pressure on the stove joints, and this in turn may result in damage to the stove.

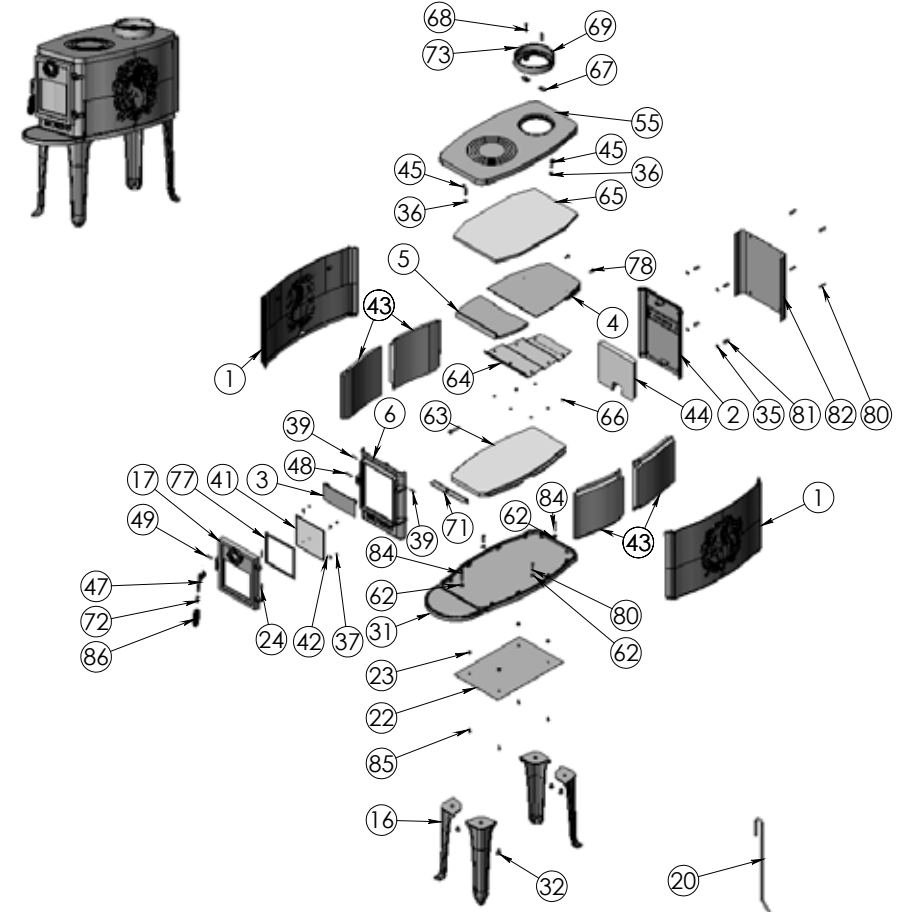
NOTE: It is best to thoroughly clean the stove after the heating season has concluded. Adding a dessicant, such as kitter litter, into the ash pan helps absorb moisture during the summer months. Be sure to remove this prior to the heating season.

Thank you for buying a morsø stove.

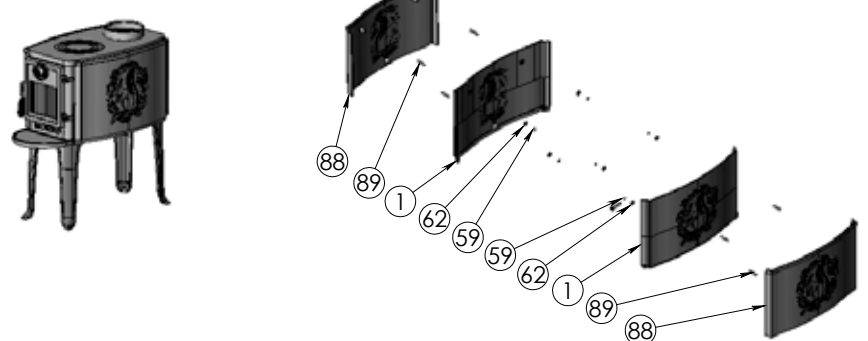
We hope you have many years of carefree warmth in its company. Some initial experimentation with loading and running techniques will decide your normal routine. If you have any problems after this short learning phase, please refer to your stove dealer. Should they be unable to help for any reason, please contact us in writing at the address on the front of this publication.

3.5 Parts diagram for model Morsø 2B Standard

2B Standard Radiant



2B Standard Convection



3.6 Parts list for model Morsø 2B Standard

Pos. No.	Parts	2B Standard without shields	2B Standard with convection shields
1	Squirrel side panel	54200321	44200521
2	Rear plate	44203721	44203721
3	Smoke valve	44200800	44200800
4	Horizontal baffle	44203600	44203600
5	Vertical baffle	34203800	34203800
6	Front	44201521	44201521
16	Leg	44200121	44200121
17	Door	44204421	44204421
20	Poker	541075	541075
22	Radiation shield - base	54137000	54137000
23	Distance tube	541439	541439
24	Hinge pin	541808	541808
31	Base	44204021	44204021
32	Screw	-	-
35	Washer	-	-
36	Screw	-	-
37	Screw	-	-
39	Screw	-	-
41	Door glass	790715	790715
42	Glass clips	790743	790743
43	Side brick	79209000	79209000
44	Rear brick	79209100	79209100
45	Bolt	-	-
47	Clasp	79127000	79127000
48	Pin	791868	791868
49	Pin	791869	791869
55	Top plate	44200721	44200721
59	Nut	-	-
62	Washer	-	-
63	Brick - base	79209300	79209300
64	Baffle - standless steel	71209061	71209061
65	Insulation	79077100	79077100
66	Screw	-	-
67	Fitting for cover w. thread	44256700	44256700
68	Screw	-	-
69	Flue collar	44145921	44145921
71	Radiation shield - front	71209161	71209161
72	Fitting for handle	75140161	75140161
73	Screw	-	-
77	Tightning tape for glass	79074200	79074200
78	Screw	-	-
80	Screw	-	-
81	Distance tube	542635	542635
82	Conv. back rear plate	54201221	54201221
84	Screw	-	-
85	Screw	-	-
86	Bakelite handle 36 mm	79118300	79118300
87	Washer	-	-
88	Konv. Squirrel side panel	-	44204121
89	Screw	-	-

Guarantee Product Registration

MORSØ 10 YEAR GUARANTEE CERTIFICATE

Behind every Morsø stove is more than 160 years of dedicated stove design and manufacturing experience. Quality control has always been at the heart of the production process and detailed measures have been put into place at all key stages of the build. Accordingly, provided that the stove has been supplied by an authorised Morsø dealer, Morsø will offer a 10-Year Manufacturers Guarantee against manufacturing defect to any of the main exterior body parts of its stoves.

Read more about "Morsø 10 years guarantee/product registration card" and
REGISTER your new Morsø stove online:
<http://international.morsoe.com/warranty-registration>

IMPORTANT!

How to heat safely for the environment and yourself!

- **Use only dry wood**

Use only dry (max. 20% moisture content) and untreated wood. The fuel must be split and 8 - 12 cm thick.

- **Light**

Light with dry kindling (use 1 - 2 kg). Leave the door ajar and stay close to the stove during the lighting phase.

- **Good layer of embers**

Be certain to have a good layer of embers before refilling. The wood should light within 2 minutes. If the logs do not ignite it may, in an extreme case, cause the flue gases to ignite which may pose a risk to material damage or personal injury.

- **Refuelling**

When refuelling use 2 - 3 pieces of wood - no more than 2 - 2.5 kg.

- **Ensure adequate air**

i.e. clear and yellow flames.

- **Never burn overnight**



By appointment to The Royal Danish Court

morsø

Morsø Jernstøberi A/S - 14.04.2020 - 72207600

MORSØ JERNSTØBERI A/S · DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

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By appointment to The Royal Danish Court

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Manuel d'installation et d'utilisation

Morsø 2B Standard

Pour utilisation en Amérique du Nord



Enregistrez ces instructions

MORSØ JERNSTØBERI A/S · DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Félicitations pour l'acquisition de votre nouveau poêle Morsø !

Morsø, le plus important fournisseur sur le marché danois, fabrique des poêles-cheminées de haute qualité depuis 1853. En suivant les présentes instructions, nous sommes persuadés que votre nouveau poêle vous apportera plaisir et satisfaction durant de nombreuses années.

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Avant d'installer et d'utiliser votre nouvel appareil de chauffage, veuillez lire ce manuel en entier. Une mauvaise installation de cet appareil de chauffage peut entraîner un incendie.

Suivez les instructions d'installation pour limiter ce risque d'incendie. Le non-respect des instructions peut entraîner des dommages matériels, corporels ou même mortels.

Contactez l'administration locale de construction concernant les restrictions et équipements d'inspection dans votre région.

Conservez ces instructions

Accessoires en option

Une gamme étendue d'accessoires (tels que gants de manipulation, ustensiles de cheminée, nettoyant pour vitre et peinture résistant à la chaleur) est disponible pour une utilisation adaptée à votre poêle Morsø. Ils facilitent l'entretien et l'utilisation de chaque jour. Contactez votre revendeur Morsø pour plus d'informations.

Le 2B Standard 2020 de Morsø ont fait l'objet de tests auprès des services de contrôle OMNI-Test Laboratories, Inc. Les standards du test sont UL-1482-2011 (R2015) pour les États Unis et ULC- S627-00 pour le Canada.



Le poêle est répertorié uniquement pour brûler du bois. Ne brûler aucun autre combustible.

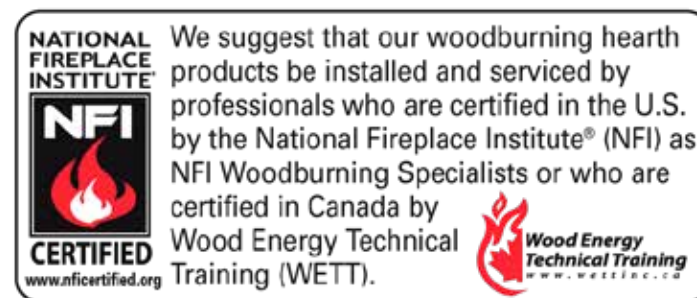
U.S. ENVIRONMENTAL PROTECTION AGENCY. Certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de corde.

L'émission moyenne de particules selon la méthode d'essai ASTM E3053-17 sur le bois de corde est de 0,55 g / h

Sous conditions spécifiques de test, on a pu constater que le rendement calorifique varie entre 6,959 et 25,299 Btu/hr

Un essai effectué conformément à la norme CSA B415.1 a montré que ce poêle avait un rendement moyen de chauffage supérieur à 80,2 %.

Ce poêle doit être révisé et réparé périodiquement pour une utilisation correcte. Il est contre la loi fédérale d'utiliser ce poêle contredit les instructions de ce manuel.



La fonte

La fonte n'est pas un matériau inerte. Raison pour laquelle il n'y a pas deux poêles identiques. Ceci en raison des marges de tolérance de la fonte et de la fabrication artisanale des poêles. De fines irrégularités sont normales sur la surface de la fonte.

1.0 Installation de votre poêle Morsø

L'installation des poêles à bois doit être sûre et légale.

Si votre poêle Morsø n'est pas installé correctement, un incendie peut en résulter. Afin de réduire ce risque, suivez attentivement les instructions d'installation. Contactez l'administration locale de construction concernant les restrictions et l'inspection de l'installation dans votre région.

Avant de commencer l'installation de votre poêle, assurez-vous que :

- Le poêle et le raccord de cheminée sont placés suffisamment loin des matériaux de combustion afin de remplir toutes les conditions d'espacement.
- La protection du sol est adéquate et correctement effectuée conformément aux conditions.

Contactez l'administration locale de construction pour toutes les approbations nécessaires.

La plaque d'informations située à l'arrière du poêle fournit les informations nécessaires concernant les données de test de sécurité, le nom du laboratoire de test agréé et les conditions d'installations.

Les conditions d'installation diffèrent selon les districts et l'administration locale de construction a le pouvoir d'autorisation définitive pour approuver votre installation. Discutez de l'installation avec eux avant de commencer. Pour plus d'informations, contactez votre vendeur.

Ne connectez aucun conduit ou système de distribution d'air.

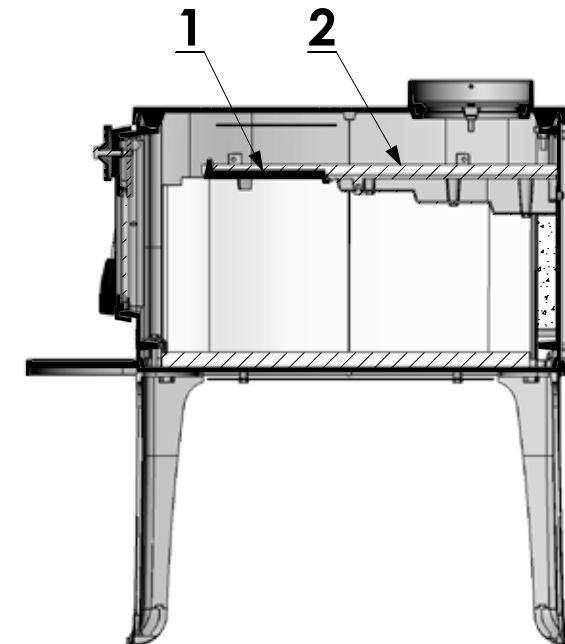
Important : Si vous ne suivez pas attentivement les instructions d'installation, il peut en résulter des situations dangereuses comme des incendies de cheminée ou de maison. Suivez attentivement les instructions et ne vous en écarter pas car cela peut entraîner des dégâts corporels ou matériels.

1.1 Déballage du poêle

2B Standard : après le déballage, dévissez la chambre de combustion de la palette avant de la poser tranquillement sur le côté. Pour éviter tout dommage du poêle et du sol, vous pouvez utiliser l'emballage en carton comme protection. Déballez les pieds fournis avec le poêle et vissez-les sur le socle en fonte à l'aide des boulons joints - Ne pas utiliser les boulons qui servent à fixer la chambre de combustion à la palette en bois.

1.2 Vérifier les pièces mobiles dans le poêle

Après le déballage, vérifiez que les briques réfractaires sont fermement en place et n'ont pas bougé pendant le transport. Vérifiez également que le contrôle d'air fonctionne librement. Avant le premier allumage, assurez-vous que le déflecteur (1) et l'isolation (2) au-dessus du déflecteur sont placés correctement, selon les illustrations ci-dessous.



Pose du déflecteur vertical

Faites passer le déflecteur vertical par la porte, comme indiqué ci-dessous (illustrations 1 et 2). Placez le déflecteur dans la position correcte (illustrations 3 et 4). Placez l'isolation sur le déflecteur.



Accessoires standard

Le gant Morsø et le joint étanche de raccord de tuyau céramique sont des accessoires standard et se trouvent habituellement dans le cendrier ou le foyer.

1.3 Le système de cheminée/conduit

Remarque : le système de conduit doit être sécurisé de façon indépendante et ne doit pas reposer sur le poêle.

Le poêle ne doit pas être raccordé à un conduit de cheminée servant à un autre appareil. (Plusieurs tuyaux peuvent parcourir une seule souche de cheminée ; utilisez un seul tuyau par appareil).

Utilisez une cheminée maçonnée de type résidentiel ou une cheminée d'usine de type HT répertoriée.

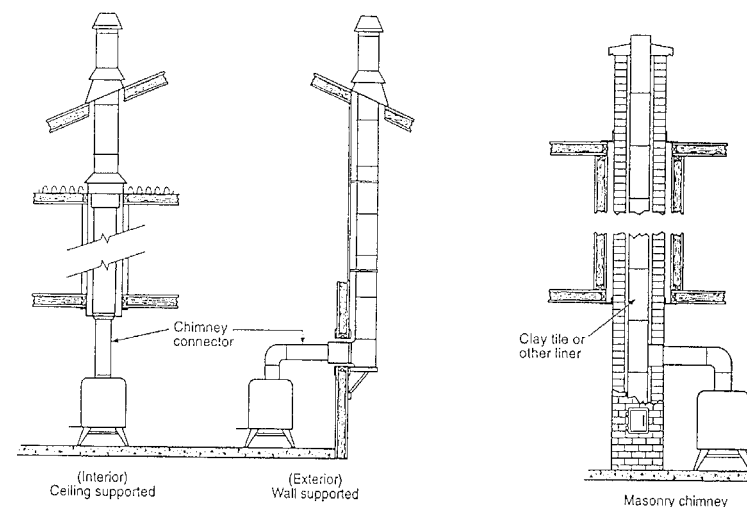
Cheminée Haute Température (H.T.) Standard UL-103-1985 (2100° F) pour les États-Unis et Standard Haute Température (650° C) ULC S-629 pour le Canada.

Les dimensions internes du raccord de cheminée et de la cheminée ne doivent pas être inférieures à 6 pouces (150 mm) de diamètre (ou coupe transversale équivalente) et ne doivent être beaucoup plus grandes. Une coupe trop grande a tendance à laisser les gaz du conduit refroidir excessivement, causant ainsi lenteur ou imprévisibilité de fonctionnement du poêle.

Nous recommandons que la longueur de la cheminée est au moins de 16 pieds (4,90 m) (pas indispensable) au-dessus du poêle dans des situations ménagères normales, mesurée du collier de serrage du tuyau à l'extrémité supérieure de la cheminée.

Les conditions locales comme, par exemple, la construction du toit, de gros arbres à proximité et une altitude élevée, peuvent avoir une influence sur le tirage et la hauteur de la cheminée. Veuillez donc contacter les ramoneurs professionnels locaux ou votre concessionnaire Morsø.

Installations typiques de cheminée usine ou maçonnée



1.4 Connexion du conduit

Un collier de serrage de tuyau est placé dans la zone du foyer.

Utilisez un raccord de cheminée bleu ou noir de 24 MSG ou un raccord de cheminée à double paroi répertorié. Reportez-vous aux règlements locaux et aux instructions du fabricant de la cheminée concernant les précautions à respecter pour faire passer une cheminée à travers un mur ou un plafond combustible. Pensez à sécuriser le raccord de cheminée avec au moins trois vis au produit et à chaque section contiguë.

Positionnez le poêle et connectez le système de conduit.

Portez des gants et des lunettes de protection lors du perçage, coupage ou assemblage des sections du raccord de cheminée.

1.5 Connexion à une cheminée déjà en place

Un raccord de cheminée est le tuyau à double ou simple paroi qui relie le poêle à la cheminée. La cheminée elle-même est la structure maçonnée ou préfabriquée qui contient le tuyau. Les raccords de cheminée permettent de relier le poêle à la cheminée.

Les raccords à double paroi doivent être testés et répertoriés pour une utilisation avec des appareils à combustibles solides. Les raccords à paroi simple doivent être faits en acier de calibre 24 ou plus. N'utilisez pas de raccords galvanisés : ils ne résistent pas aux hautes températures atteintes par la fumée et les gaz d'échappement et qui peuvent dégager des vapeurs toxiques sous grande chaleur. Le raccord doit avoir un diamètre de 6 pouces (150 mm).

Si possible, évitez de faire passer le raccord de cheminée à travers un mur ou un plafond combustible. Si cela est inévitable, référez-vous aux sections sur Traverser les murs. Ne faites pas passer le raccord à travers un grenier, un placard ou tout espace confiné semblable lors de l'installation des raccords de cheminée.

Il est primordial de garder les gaz du tuyau en déplacement doux dans la bonne direction. Ne déviez pas dans un grand vide à cet endroit ; formez plutôt une section continue jusqu'en haut. Utilisez des courbures moyennes (par ex. 45° au lieu de 90°) plutôt que des angles aigus lorsqu'un changement de direction est nécessaire. Toutes les parties du conduit doivent être accessibles pour des raisons de nettoyage.

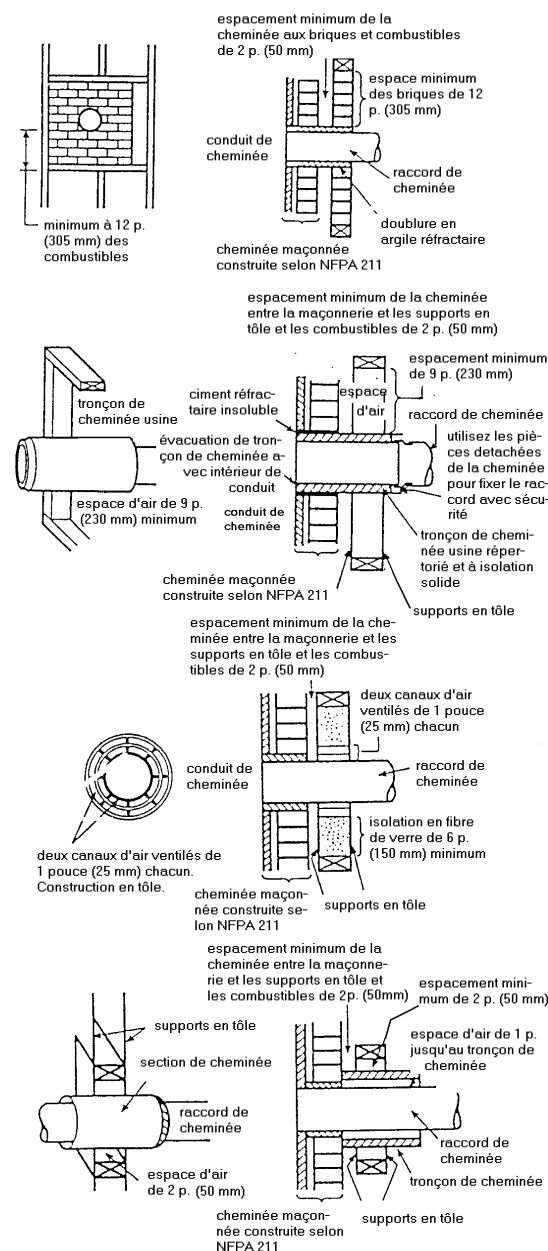
Dans les tronçons de cheminée horizontaux, maintenez un espacement de 18 pouces (455 mm) du plafond. Gardez-les aussi courts et directs que possible avec des coudes n'excédant pas 90 degrés. Inclinez les tronçons horizontaux de raccords de ¼ par pied (20mm par mètre) en partant du poêle vers la cheminée. La longueur maximum recommandée d'un tronçon horizontal est de 3 pieds (1 mètre) et la longueur totale ne doit pas dépasser 8 pieds (2,5 mètres).

Les informations sur l'assemblage et l'installation des raccords sont fournies par les instructions du fabricant, comme vous assemblez et fixez le raccord au poêle et à la cheminée.

Assurez-vous que le poêle et le raccord de cheminée installés se trouvent à une distance correcte des matériaux de combustion proches. Voir le paragraphe sur les espacements page 8.

Si le conduit passe par une paroi ou une cloison de construction inflammable, l'installation doit être conforme à la norme CAN/CSA-B365.

Systèmes de raccord de cheminée et autorisations des appareils de chauffage ménagers à travers les murs inflammables



A. Maçonnerie en briques charpentée d'au moins 3,5 pouces (90 mm) d'épaisseur dans un mur inflammable avec une séparation en brique de 12 pouces (305 mm) minimum de la doublure en argile aux combustibles. La doublure en argile réfractaire doit aller de la surface de la sortie du mur en brique jusqu'à la surface interne de la doublure du tuyau de cheminée mais pas au delà et doit être solidement cimentée en place.

B. Tronçon de cheminée usine répertoriée, à isolation solide, de même diamètre intérieur que le raccord de cheminée et ayant une isolation de 1 pouce (25 mm) ou plus avec un espace d'air minimum de 9 pouces (230 mm) entre le mur extérieur de la longueur de la cheminée et les combustibles.

C. Raccord de cheminée en tôle, minimum calibre 24 en épaisseur, avec un cylindre ventilé minimum calibre 24 en épaisseur ayant deux canaux d'air de 1 pouce (25 mm), séparés des combustibles par au moins 6 pouces (150 mm) d'isolation de fibre de verre. L'ouverture doit être couverte et le cylindre soutenu par un support en tôle, minimum calibre 24 en épaisseur.

D. Tronçon de cheminée usine répertoriée, à isolation solide d'un diamètre intérieur plus grand de 2 pouces (50 mm) que le raccord et ayant une isolation de 1 pouce (25 mm) ou plus, servant de traverse pour un raccord de cheminée à simple paroi en tôle d'épaisseur minimum de calibre 24, avec un espace d'air d'au moins 2 pouces (50 mm) entre le mur extérieur de la section de cheminée et les combustibles. La longueur minimum de la section de cheminée doit être de 12 pouces (305 mm) et espacée de 1 pouce (25 mm) du raccord utilisant des plaques de soutien en tôle à chaque extrémité de la section de cheminée. L'ouverture doit être couverte et la section de cheminée soutenue des deux côtés avec des supports en tôle fixés à des murs de calibre 24 épaisseur minimum. Les fixations utilisées pour sécuriser la section de cheminée ne doivent pas pénétrer la doublure du conduit de cheminée.

1.6 Positionnement du poêle

Distance avec murs et linteaux

Si le poêle se trouve à proximité de matériaux combustibles, consultez tous les règlements de constructions locaux et nationaux en vigueur en ce qui concernent les espacements. Quels que soient les règlements qui s'appliquent à votre région, n'installez en aucun cas le poêle à moins de 8 pouces (205 mm) des matériaux combustibles sur les côtés et à moins de 16 pouces (405 mm) au-dessus du poêle (des installations des poêles demandent plus d'espacement au-dessus du poêle - voir le graphique des distances en dessous). Il peut s'avérer nécessaire d'augmenter ces distances si les matériaux sont sensibles à la chaleur. Notez également que les papiers peints et autres matériaux de décoration peuvent se détacher sous l'effet de la chaleur. Prenez garde à ce qu'ils ne tombent pas sur le poêle, le cas échéant.

Si le poêle se trouve à proximité de matériaux non combustibles, un espace de 4 pouces (100 mm) ou plus est recommandé pour des raisons de nettoyage et afin d'assurer la circulation de la chaleur autour du poêle et dans toute la pièce.

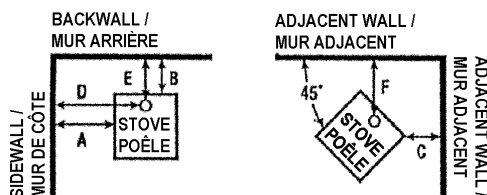
Conditions d'espacement pour 2B Standard sans protecteur (raccord à simple paroi)

Conditions d'espacement requises:	Installation résidentielle standard (raccord à simple paroi)	
	États-Unis	Canada
A. De la paroi latérale à l'unité	26"	26" (660 mm)
B. De la paroi arrière à l'unité	16"	16" (406 mm)
C. De la paroi d'angle à l'unité	16"	16" (406 mm)
D. De la paroi latérale au raccord	29"	29" (737 mm)
E. De la paroi arrière au raccord	18"	18" (457 mm)
F. De la paroi d'angle au raccord	19"	19" (483 mm)
G. De l'unité au plafond	-	-
H. Du sol au plafond	-	-

Conditions d'espacement – 2B Standard avec protecteur de convection (raccord à simple paroi)

Conditions d'espacement requises:	Installation résidentielle standard (raccord à simple paroi)	
	États-Unis	Canada
A. De la paroi latérale à l'unité	26"	26" (660 mm)
B. De la paroi arrière à l'unité	16"	16" (406 mm)
C. De la paroi d'angle à l'unité	16"	16" (406 mm)
D. De la paroi latérale au raccord	26"	26" (606 mm)
E. De la paroi arrière au raccord	23"	23" (583 mm)
F. De la paroi d'angle au raccord	19"	19" (483 mm)
G. De l'unité au plafond	-	-
H. Du sol au plafond	-	-

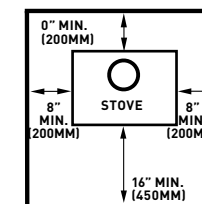
MINIMUM CLEARANCES TO COMBUSTIBLES: DEGAGEMENTS MINIMAUX AUX MATERIAUX COMBUSTIBLES:



Conditions d'espacement pour 2B Standard avec et sans protecteurs (raccord à double paroi)

Conditions d'espacement requises:	Installation résidentielle standard (raccord à double paroi)	
	États-Unis	Canada
A. De la paroi latérale à l'unité	20"	20" (508 mm)
B. De la paroi arrière à l'unité	12"	12" (305 mm)
C. De la paroi d'angle à l'unité	16"	16" (406 mm)
D. De la paroi latérale au raccord	26"	26" (660 mm)
E. De la paroi arrière au raccord	14"	14" (356 mm)
F. De la paroi d'angle au raccord	19"	19" (483 mm)
G. De l'unité au plafond	-	-
H. Du sol au plafond	-	-

EXIGENCES PROTECTION DU SOL



LE PROTECTEUR DE PLANCHER DOIT ÊTRE D'UN MATÉRIEL INCOMBUSTIBLE. IL DOIT S'ÉTENDRE EN DESSEUS DE L'APPAREIL ET AU DEVANT, AUX CÔTÉS ET À L'ARRIÈRE DE L'APPAREIL COMME INDIQUÉ

Exigences de protection du sol	Matériaux incombustibles sous le poêle	
	États-Unis	Canada
A. Distance de prolongement, arrière	-	200 mm
B. Distance de prolongement, côté droit	6"	200 mm
C. Distance de prolongement, côté gauche	6"	200 mm
D. Distance de prolongement, avant	16"	450 mm

Sur le sol

Si le poêle est placé sur un sol combustible, une protection solide non combustible doit couvrir le sol sous le poêle. Cette protection doit couvrir une zone d'au moins 16 pouces (450 mm Canada) devant la porte du poêle et au moins 8 pouces (200 mm Canada) de chaque côté de l'ouverture amovible pour le mazout ou les cendres. Pour les tuyaux de cheminée horizontaux, une protection non combustible doit être placée au-dessus du tuyau, dépassant de 2 pouces de chaque côté.

Vous devez vous assurer que le sol dans cette zone peut aisément supporter le poids du poêle.

Distance des meubles

La distance minimum recommandée entre le poêle et les meubles est de 30 pouces (760 mm). Veuillez noter que certains meubles sont plus facilement affectés par la chaleur et peuvent par conséquent nécessiter d'être plus éloignés. Ceci est votre responsabilité.

De plus, maintenez tout autre matériau combustible éloignés du poêle. En général, une distance de 30 pouces (760 mm) doit être conservée entre le poêle et les objets inflammables mobiles tels que chiffons, journaux, bois de chauffage, etc.

NE PAS INSTALLER DANS UN MOBILE HOME

Remarque :

Protection de l'acide

En cas de lavage à l'acide de la maçonnerie autour du poêle, protégez la surface du poêle avec une couverture résistante à l'acide.

Entrée d'air frais

A moins que la circulation d'air dans la pièce par les portes, fenêtres et autre soit jugée suffisante, une entrée d'air frais est nécessaire. Cette entrée d'air doit avoir un espace d'air libre de 2 pouces carrés (1250 mm carrés). Ceci est particulièrement important lorsque la pièce est bien scellée ou lorsqu'une hotte aspirante ou un système de ventilation perturbe la pression naturelle de l'air. Une telle entrée d'air ne doit pas se trouver sur un mur habituellement sujet à une pression négative du déplacement habituel du vent. Évitez de placer l'entrée d'air directement à l'opposé du poêle dans la pièce créant ainsi un courant d'air froid.

2.0 Fonctionnement

2.1 Avant d'allumer le feu

Pour une utilisation avec des combustibles solides uniquement. Ne poussez pas trop le feu, si l'appareil ou le raccord de cheminée devient incandescent, le feu est trop fort. Inspectez et nettoyez fréquemment la cheminée. Dans certaines conditions d'utilisation, la formation de créosote peut arriver rapidement. A cause des risques de débordement de fumée et de flammes, opérez uniquement avec la porte fermée.

Attention :

Chaud pendant le fonctionnement.

Tenir les enfants, vêtements et meubles éloignés.

Risque de brûlures cutanées en cas de contact.

Ne pas utiliser de produits chimiques ni de liquides pour l'allumage.

Ne pas brûler de déchets ni de liquides inflammables.

Ne pas utiliser d'essence, de pétrole à lampe, de kérosène, d'allumeur ou de liquide à charbon de bois ou tout autre liquide pour démarrer ou relancer un feu dans ce poêle.

Tenir tous ces liquides éloignés du poêle pendant son fonctionnement.

Choisir votre combustible

Vous pouvez brûler tous les types de bois naturel dans ce poêle mais ils doivent être bien secs. Une fois coupé en longueur, couper le bois en deux – conformément aux dimensions mentionnées ci-dessous- pour permettre à l'humidité de s'évaporer.

Couper le bois à une longueur maximale de 18 pouces (45 cm) et d'un diamètre d'environ 3 à 3,5 pouces (7 à 8 cm). Si vous pouvez peser votre bois, comptez environ 1,0 kg. Pour une combustion optimale et un bon dégagement de chaleur, le bois doit pas contenir plus de 20% d'humidité; ceci peut facilement être contrôlé à l'aide de l'hygromètre Morsø (article # 62929900)

Stockez les bûches couvertes dans un endroit bien aéré, où l'air peut circuler entre les bûches. Certains bois tendres peuvent n'avoir besoin que d'un bel été pour sécher, alors que certains bois plus durs, comme p.ex. le chêne, l'érable et l'orme peuvent prendre jusqu'à 18 mois. Éviter du bois trop sec, souvent d'une couleur tirant sur le gris, car dans certaines conditions, cela peut poser des problèmes de rendement tels que lenteur et projection d'étincelles. Un bois bien sec est léger à manipuler et présente des fentes du centre vers les extrémités. Si votre bois crépite ou grésille en brûlant et que de la suie persiste à se former sur la porte vitrée du poêle, votre bois n'est pas suffisamment sec.

N'utilisez jamais de dérive (de la mer) dont le contenu salé peut entraîner de la corrosion, ni du bois de construction pouvant être imprégné de produits chimiques.

Allumage

Au début, faites un petit feu pour que la peinture s'accoutume et que les plaques principales du poêle se mettent en place. La peinture peut dégager des vapeurs. Aérez la pièce pendant cette phase. Le réglage de l'aération, les techniques d'allumage et les intervalles d'alimentation dépendent du tirage de la cheminée, du combustible utilisé, de la chaleur voulue, etc. Quelques techniques de base sont soulignées ci-dessous.

En principe:

Votre poêle est équipé d'entrées d'air primaire et secondaire.

L'air primaire est contrôlé grâce au levier situé sous le rebord à cendres du poêle. Pour ouvrir l'admission d'air, déplacer le levier de contrôle vers le bas. De l'air préchauffé pénètre alors dans la chambre de combustion via le système de "nettoyage d'air" situé à l'intérieur du poêle et au dessus de la vitre. L'air secondaire arrive vers la chambre de combustion grâce au déflecteur spécialement conçu, situé derrière la chambre de combustion.

L'air secondaire est injecté dans les gaz du conduit à la fois au dessus et en face du feu, rendant ainsi le processus de combustion plus propre et plus efficace. L'admission d'air secondaire est constamment ouverte et n'est pas réglable. Pour plus de sécurité, votre poêle est équipé d'une poignée amovible. Lorsqu'elle n'est pas utilisée, on peut la ranger grâce au goujon au pied droit du poêle.

2.2 Allumage et intervalles d'alimentation

Le premier allumage du poêle nécessite un volume d'air important. Lorsque le poêle est froid, laissez la porte entrouverte de 2 ou 3 cm pendant les premières minutes et ouvrez complètement l'entrée d'air primaire. Ne laissez pas le poêle sans surveillance tant que la porte est ouverte.

Afin de constituer un lit de cendres raisonnable au fond du poêle, utilisez 2 à 4 livres de petit bois sec lors du premier allumage. Maintenez en permanence une couche de 1 à 1,5 pouces (2 à 3 cm) de cendres au fond de la chambre de combustion à chaque fois.

1. Lorsqu'on allume un poêle à bois, il est recommandé d'utiliser la méthode d'allumage Top Down. C'est la méthode d'allumage la plus respectueuse de l'environnement. Pour obtenir rapidement la formation d'une couche de braises, utiliser pour l'allumage 2 sachets allume-feu, ainsi que 2 kg environ de bois d'allumage. Poser les allume-feu juste en-dessous de la couche supérieure de petit bois.

Il est important de commencer avec précaution, de telle sorte que la combustion se développe lentement. De cette manière, la formation de suie sur la vitre est faible. En effet, l'encrassement de la vitre est souvent dû à une combustion trop violente et au fait que les flammes entrent en contact avec des surfaces froides. En évitant la formation de suie lors de l'allumage et en faisant en sorte d'obtenir une couche de braises chaudes, la formation de suie sera minimale lors des étapes suivantes d'alimentation.

2. Ouvrez complètement le régulateur d'air secondaire.

3. Allumez le feu.

4. Après l'allumage, fermez partiellement les portes en les laissant entrouverte de 2 ou 3 cm pour laisser entrer suffisamment d'air de combustion.

5. Lorsque la cheminée est chaude après 5 à 10 minutes, fermez la porte. Un lit de braises convenable se forme au bout de 15 à 20 minutes.



6. Au moment de recharger, repartez les braises dans le foyer en les rapprochant surtout vers l'avant du poêle.

7. Poser trois morceaux de bois sur les braises. Laissez ½ pouce (1 cm) ou plus entre chaque morceau.

Toujours garder la charge de carburant sous le tube d'air secondaire le plus bas. L'espace devant et au-dessus du tube à air le plus bas est réservé à la combustion de gaz volatil.

8. Fermez la porte et laissez l'entrée d'air primaire complètement ouverte.

9. Après quelques minutes, réglez l'entrée d'air primaire en fonction de la chaleur voulue.

10. Anticipez chaque alimentation et souvenez-vous de n'ajouter qu'une modeste couche de bois tant qu'il y a beaucoup de braises. Reprenez les points 5 à 8.



N'essayez en aucun cas d'accroître le feu de votre poêle en modifiant le réglage du contrôle d'air décrit dans ces instructions.

Attention : Les poêles à feu de bois ne doivent jamais être laissés sans surveillance la porte ouverte.

Cet appareil de chauffage à bois a un taux de combustion minimal inférieur fixé par le fabricant et qu'il convient de ne pas modifier. Les règles fédérales interdisent de modifier ce réglage ou d'effectuer sur ce poêle toute autre intervention contrevenant aux instructions de service figurant dans le présent manuel

Si vous laissez les portes entrouvertes, gaz et flammes peuvent sortir du foyer par l'ouverture, créant ainsi des risques d'incendie et de fumée. Nous vous conseillons d'installer un détecteur de fumée dans la pièce où vous installez le poêle.

NE PROVOQUER JAMAIS DE SURCHAUFFE. Toute surchauffe peut entraîner un incendie ou des dégâts permanents pour le poêle. Si n'importe quelle pièce du poêle devient incandescente, vous êtes en surchauffe.

Le poids maximal de bois recommandé par charge est de 3,5 kg/7 lbs (environ 5 bûches).

Dans des conditions de chauffage normales, la température moyenne à l'intérieur du tuyau du poêle, mesurée à 20 cm au-dessus du poêle est d'env. 300° C (550°F). La température maximale dans le tuyau du poêle ne doit pas excéder 450° C (750°F). Une température du poêle dépassant 450° C (750°F) est considérée comme surchauffe et peut être la cause d'une usure prématurée du poêle.

Pour permettre de mesurer correctement la température de fonctionnement de votre poêle, nous recommandons l'utilisation du Thermomètre à gaz pour poêle Morsø (article # 62901200). Le Thermomètre à gaz pour poêle est magnétique; il se fixe sur le tuyau du poêle, à environ 20 cm (8") au-dessus de la plaque supérieur du poêle, et mesure la température de surface du tuyau du poêle. Disponible auprès de votre distributeur Morsø agréé.

Conditions de tirage

Si de la fumée ou des émanations se dégagent du poêle lors de l'allumage et de l'alimentation ou si tout simplement le feu ne prend pas, ceci est sûrement dû à un faible tirage. (Dans très peu de cas, pas assez d'air frais entre dans la pièce – voir les conseils d'installation plus haut). Demandez conseil à votre vendeur pour savoir comment améliorer votre système de tuyauterie pour accroître le tirage.

Règles de feu de bois

Pour avoir moins de chaleur, mettez moins de bûches dans le poêle et réduisez la quantité d'air. Il est toujours important de maintenir une bonne couche de braises.

Moins de chaleur – moins de bois – moins d'air

Plus de chaleur – plus de bois – plus d'air

Des dépôts de suie se font sur la vitre si le poêle fonctionne trop lentement ou si votre bois n'est pas assez sec.

Il est fortement conseillé de ne pas laisser le poêle allumé pendant la nuit. En plus des effets nocifs sur l'environnement, le rendement du bois serait mauvais puisque les gaz qu'il contient ne s'enflamment pas à basse température mais se fixent sous forme de suie (gaz non consommés) dans la cheminée et le poêle.

Détecteurs de monoxyde de carbone

Dans certaines juridictions, l'installation de détecteurs de fumée et d'oxyde de carbone dans les lieux où sont placés des appareils de chauffage est obligatoire. Pour assurer votre sécurité, installez au moins un détecteur de fumée à chaque étage de votre maison. Il devra être placé à distance de l'appareil à bois et à proximité des espaces de repos. En effet, en plaçant un détecteur de fumée trop près du poêle, l'alarme risque de se déclencher si un rejet de fumée intervient lorsqu'on ouvre la porte pour remettre du bois. Suivez les instructions du fabricant de détecteurs de fumée concernant l'emplacement, l'installation et l'entretien.

3.0 Entretien

Lors de l'entretien de votre poêle, portez toujours des lunettes et des gants de protection.

3.1 Entretien extérieur

La surface du poêle est peinte avec la peinture résistant à la chaleur Senotherm. Nettoyez de préférence avec un aspirateur équipé d'un embout à brosse souple ou en essuyant avec un chiffon anti-peluche.

Au bout d'un certain temps, la surface peinte peut devenir légèrement grise. Vous pouvez trouver une boîte de peinture en spray pour retouche Morsø chez votre revendeur. Il suffit de quelques minutes – en suivant les instructions – pour l'appliquer. Lors du premier allumage après une retouche, une légère odeur peut se dégager du poêle le temps de l'accoutumance de la peinture. Assurez-vous de bien aérer la pièce pendant cette période.

3.2 Entretien intérieur

Vitre

Si le poêle est généralement utilisé aux températures correctes, la vitre ne devrait être que peu ou pas sale. Si de la saleté se dépose lors de l'allumage, la majeure partie brûlera au fur et à mesure que la température augmente. En cas de dépôts plus importants qui ne brûlent pas, utilisez le nettoyeur pour vitres Morsø. Appliquez sur la vitre froide en suivant les instructions. N'utilisez jamais de nettoyeurs abrasifs sur la surface vitrée.

Causes possibles de vitre sale

- Combustible trop humide
- Bûches trop grandes ou non fendues
- Température de combustion trop basse

**Ne pas nettoyer le verre lorsqu'il est chaud
Remplacez immédiatement toute vitre cassée.
N'utilisez pas votre poêle si la vitre de la porte est endommagée.**

Si vous devez changer la vitre, utilisez du verre céramique à haute température fourni par Morsø. Contactez votre concessionnaire Morsø.

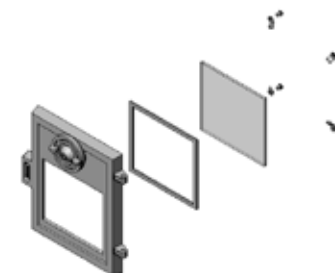
Installer la vitre

N'installez jamais la vitre lors du fonctionnement du poêle.

Remplacement de la vitre céramique

Le verre céramique ne peut pas être recyclé, car sa température de fusion est trop élevée. Si le verre céramique est mélangé au verre normal, la matière première est dénaturée et le processus de recyclage du verre peut être interrompu. Veillez à ce que le verre réfractaire ne soit pas traité comme matériau à recycler normal. Vous contribuerez beaucoup à la protection de l'environnement.

ATTENTION ! Doit être déposé comme vitre céramique dans une station de collecte des déchets.



1. Soulevez la porte pour la sortir de ses gonds et posez-la face avant vers le bas sur des cartons ou tout autre tissu non abrasif.
2. Dévissez les quatre boulons qui maintiennent la vitre. (Au cas où un boulon se casserait lors du dévissage, retirer le reste du boulon en perçant au centre avec une mèche de perceuse acier grande vitesse de 1/8 de pouce (3 mm). Des mèches plus petites peuvent également convenir mais n'utilisez en aucun cas de mèche plus grande. Assurez-vous que la mèche ne touche pas les bords du boulon – ceci pouvant endommager le filetage dans la fonte).
3. Retirez le joint d'étanchéité en céramique usagé et nettoyez la surface en dessous avec de la paille de fer ou du papier de verre pour éliminer les particules.
4. Mettez en place le nouveau joint d'étanchéité tout autour de l'emplacement de la vitre en vous assurant de bien le pincer tout le long de façon à faire un joint continu. Ne laissez aucun espace.
5. Placez la nouvelle vitre sur les bandes et revissez les boulons et équipements à la main.
6. Enfin, donnez environ un demi-tour supplémentaire aux boulons. La vitre doit être tenue assez fermement de manière à ne pas bouger pendant le nettoyage. Ne vissez pas les boulons trop fort car cela entraîne une pression excessive sur la vitre risquant de la casser - important !

Afin de réduire le risque de casser la vitre, évitez de frapper sur la vitre ou de claquer la porte.

Pièces de rechange intérieures

L'équipement feu – comprenant le cendrier, la grille, les briques réfractaires, plaques de fonte pour protection feu, la vitre, le déflecteur et le collier de serrage du tuyau – est soumis à une chaleur extrême produite par le feu. De temps en temps, il peut s'avérer nécessaire de remplacer une de ces pièces pour des raisons d'entretien routinier.

Remplacement des pierres

Lors du remplacement des pierres, dévisser à l'arrière du poêle la plaque de rayonnement, fixée avec 4 vis. Cela permet d'accéder aux 2 boulons, maintenant en place la chicane pour la fumée. Retirer ces boulons de manière à pouvoir lever la chicane pour la fumée à l'intérieur du poêle. Lever la chicane pour la fumée afin de pouvoir sortir la pierre du poêle et installer la nouvelle. Placer les pierres latérales dans les rainures de la plaque de fond en vermiculite. Lorsque les pierres sont placées correctement, abaisser la chicane pour la fumée sur les pierres et la revisser sur le côté arrière en fonte du poêle.

Pour terminer, monter la plaque de rayonnement arrière avec les 4 vis.

REMARQUE : L'équipement feu, la corde céramique et la finition de peinture ne sont pas couverts par la garantie.

Toutes ces pièces de rechange sont en vente chez votre concessionnaire Morsø et nous vous recommandons de remplacer toute pièce endommagée aussi tôt que possible afin d'éviter des dégâts supplémentaires.

Si le déflecteur est déformé par une surchauffe, le poêle continue à fonctionner même si sa performance peut être compromise. Remplacez-le dès que possible.

Causes possibles d'usure interne rapide

- Feu fort et persistant
- Accumulation de suie et de cendres

Joint d'étanchéité

Le joint entourant le périmètre des portes peut durcir avec le temps. Remplacez-les s'il devient difficile de fermer les portes ou si l'air commence à s'infiltrer autour des portes, causant ainsi un feu un peu moins contrôlable. Un jeu de joint Morsø est en disponible chez votre revendeur.

3.3 Nettoyage du poêle et du conduit

Vérifiez la présence de suie au-dessus de la plaque du déflecteur et autour de la sortie du tuyau environ tous les mois pour commencer. Si le poêle devient soudain lent, regardez si de la suie est tombée autour du collier de serrage du tuyau ou dans le tuyau/ la cheminée.

Effectuez une inspection de la cheminée et du raccord de cheminée au moins tous les deux mois pendant la saison de chauffage pour détecter la formation éventuelle de créosote. S'il y a de créosote il faut l'éliminer pour réduire le risque d'un feu de cheminée.

Nettoyez le tuyau/ la cheminée – sur toute la longueur du poêle jusqu'à l'extrémité du tuyau sur le toit de la maison.

Une bonne habitude est de nettoyer le tuyau après chaque saison de chauffage dans tous les cas et d'inspecter avant chaque saison pour vous assurer qu'aucun nid d'oiseau ou autre bouchon ne s'est constitué pendant la saison de non-utilisation.

Élimination des cendres

Videz les cendriers quotidiennement ou selon les besoins. Si vous laissez des cendres s'accumuler en dessous de la grille, la chaleur est piégée et cela peut entraîner un mauvais fonctionnement prématuré de la grille.

Videz le cendrier selon cette procédure :

Ouvrez les portes avant et utilisez une pelle ou un tisonnier pour remuer l'excès de cendres et la faire tomber dans les cendriers à travers les fentes de la grille. Retirez le cendrier en prenant soin de bien le tenir horizontal.

Jetez les cendres dans un récipient en métal avec un couvercle hermétique.

Placez le récipient fermé contenant les cendres sur un sol non inflammable ou sur la terre, bien éloigné de tout matériau combustible en attendant l'enlèvement définitif. Si vous vous débarrassez des cendres en les enterrant ou en les dispersant, gardez-les dans le récipient fermé jusqu'à leur refroidissement complet. Remettez le cendrier en place et fermez le poêle.

Attention:

Ne jamais vider un poêle en train de fonctionner.

Ne jamais utiliser votre aspirateur ménager ou professionnel pour enlever les cendres du poêle; toujours éliminer les cendres correctement.

Créosote – Formation et élimination.

Lorsque le bois brûle lentement, il produit du goudron et d'autres vapeurs organiques qui s'associent avec l'humidité émise pour former du créosote. Les vapeurs de créosote se condensent dans le conduit de cheminée relativement froid lors d'un feu brûlant faiblement. Il en résulte que les résidus de créosote s'accumulent sur la paroi du tuyau. Une fois enflammé, le créosote crée un feu extrêmement chaud. Vérifiez la cheminée et le conduit de cheminée au moins deux fois par mois pendant la saison de chauffage pour contrôler l'absence de formation de créosote. En cas de dépôt de créosote, éliminez-le pour diminuer le risque de feu de cheminée.

Ramonage de la cheminée

Inspectez le système régulièrement au cours de la saison de chauffage comme partie intégrante d'un programme d'entretien régulier. Pour inspecter la cheminée, laissez le poêle refroidir complètement. Puis, à l'aide d'un miroir, regardez par le collier du tuyau dans le conduit de cheminée. Si vous ne pouvez pas inspecter le système de conduit de cette façon, déconnectez le poêle pour faciliter l'accès.

Nettoyez la cheminée à l'aide d'une brosse de la même forme et taille que le tuyau. Faites coulisser la brosse de haut en bas et inversement dans le conduit afin de faire tomber tous les dépôts en bas de la cheminée où vous pouvez les évacuer grâce à la porte de nettoyage.

Nettoyez le raccord de cheminée en déconnectant les sections, mettez-les à l'extérieur et éliminez tous les dépôts avec une brosse dure. Remettez les sections du raccord en place après le nettoyage en vous assurant de sécuriser les joints entre chaque section avec des vis en tôle. Si vous ne pouvez pas inspecter ou nettoyer la cheminée vous-même, contactez votre concessionnaire Morsø ou un ramoneur professionnel.

En cas de feu de cheminée, agissez rapidement et :

1. Fermez le contrôle d'air.
2. Faites sortir tout le monde de la maison.
3. Appelez les pompiers.

Entretien annuel

Avant la saison de chauffage, effectuez un nettoyage en profondeur, inspectez et réparez: Nettoyez la cheminée et le raccord de cheminée à fond.

Vérifiez si la cheminée est abîmée ou usée. Remplacez les sections faibles de la cheminée préfabriquée. Faites faire les réparations par un maçon pour la cheminée maçonnée.

Inspectez le raccord de cheminée et remplacez les sections endommagées.

Vérifiez l'usure ou la compression de l'étanchéité et remplacez si nécessaire.

Vérifiez si la vitre est craquelée; remplacez si nécessaire.

Vérifiez si la porte et les poignées ferment bien. Ajustez si nécessaire.

UTILISEZ TOUJOURS DES PIÈCES DE RECHANGE D'ORIGINE MORSØ

3.4 Périodes prolongées de non-utilisation du poêle

Important:

Si vous n'utilisez pas le poêle pendant une période quelconque, nettoyez-le en profondeur et laissez l'aération légèrement ouvert pour laisser l'air circuler. Assurez-vous que le tuyau ne laisse pas entrer d'eau de pluie près du poêle ; installez un chapeau sur la cheminée mais ne bouchez pas complètement le tuyau.

Ces mesures permettent d'assurer un léger courant d'air dans le poêle et au corps du poêle de rester sec, dans les moindres recoins.

Les cendres laissées dans un poêle qui ne brûle pas attirent l'humidité comme du papier buvard. Si vous laissez l'humidité s'installer dans le poêle, de la rouille se forme. La rouille s'étend dès qu'elle prend prise. Ceci peut entraîner une pression excessive sur les joints du poêle, endommageant ainsi ultérieurement le poêle.

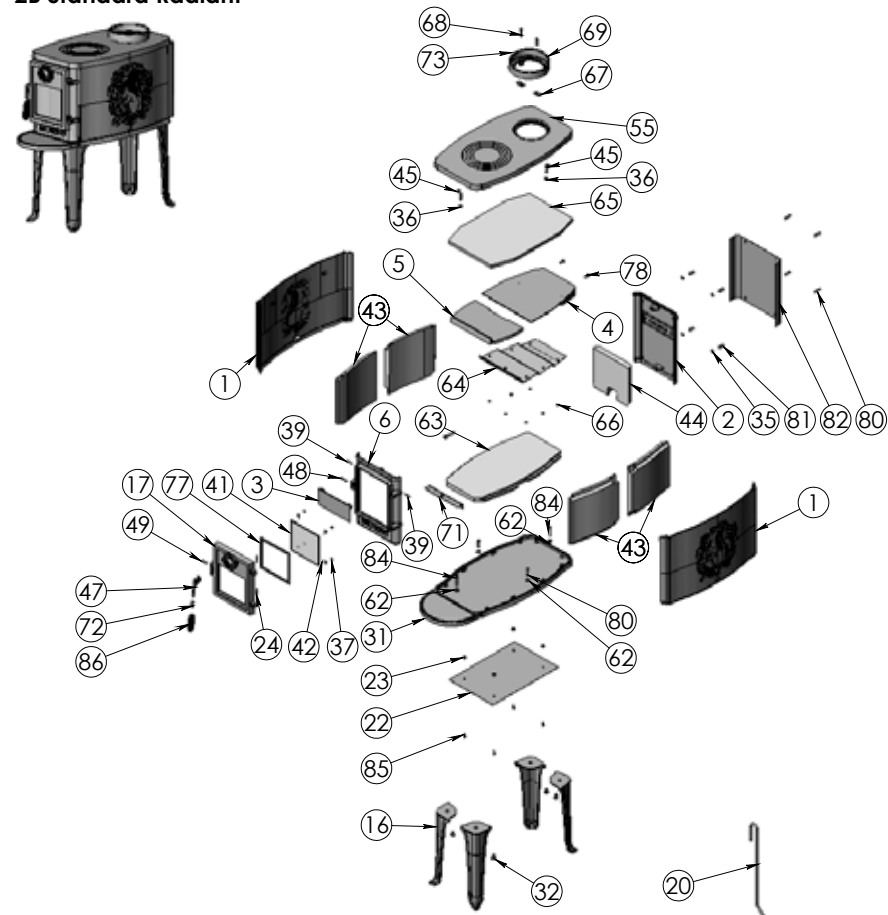
REMARQUE : Il est préférable de nettoyer à fond le poêle à la fin de la saison de chauffage. Ajouter un dessicatif, comme de la litière pour chat, dans le cendrier aide à absorber l'humidité pendant les mois d'été. Assurez-vous de l'enlever avant la saison de chauffage.

Nous vous remercions d'avoir acheté un poêle Morsø

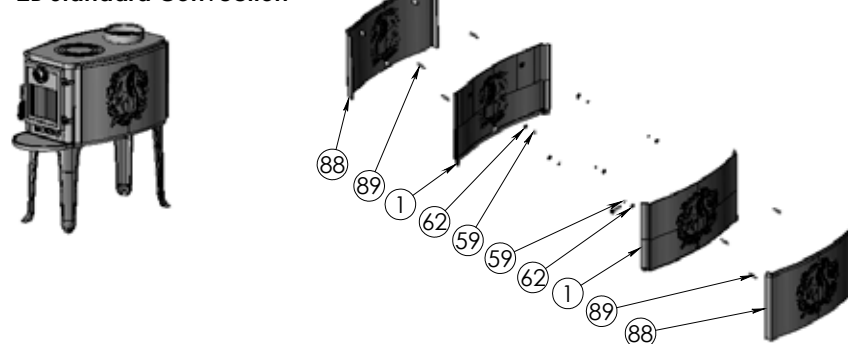
Nous vous souhaitons des années de chaleur sans souci en sa compagnie. Après quelques expérimentations initiales avec les techniques d'alimentation et de fonctionnement, vous trouverez vos habitudes. En cas de problèmes après cette courte phase d'apprentissage, adressez-vous au vendeur de votre poêle. Si celui-ci est dans l'impossibilité de vous aider, veuillez nous contacter par écrit à l'adresse figurant sur la première page de cette publication.

3.5 Schéma des pièces détachées pour le modèle Morsø 2B Standard

2B Standard Radiant



2B Standard Convection



3.6 Liste des pièces détachées pour le modèle Morsø 2B Standard

Pos. No.	Parts	2B Standard poêle à rayonnement	2B Standard poêle à convection
1	Panneau latéral Ecureuil	54200321	44200521
2	Plaque arrière	44203721	44203721
3	Valve à fumée	44200800	44200800
4	Déflexeur horizontal	44203600	44203600
5	Déflexeur vertical	44203800	44203800
6	Face frontale	44201521	44201521
16	Pied	44200121	44200121
17	Porte	44204421	44204421
20	Tisonnier	541075	541075
22	Écran de protection radiant - base	54137000	54137000
23	Tube d'éloignement	541439	541439
24	Axe de charnière	541808	541808
31	Base	44204021	44204021
32	Vis	-	-
35	Rondelle	-	-
36	Vis	-	-
37	Vis	-	-
39	Vis	-	-
41	Porte vitrée	790715	790715
42	Clip vitre	790743	790743
43	Brique, latérale	79209000	79209000
44	Brique, arrière	79209100	79209100
45	Boulon	-	-
47	Fixation	79127000	79127000
48	Pivot	791868	791868
49	Pivot	791869	791869
55	Plaque supérieure	44200721	44200721
59	Boulon	-	-
62	Rondelle	-	-
63	Brique, arrière	79209300	79209300
64	Déflexeur, inoxydable	71209061	71209061
65	Isolation	79077100	79077100
66	Vis	-	-
67	Équipement à filetage pour couvercle	44256700	44256700
68	Vis	-	-
69	Collier de serrage du tuyau	44145921	44145921
71	Écran de protection radiant, face	71209161	71209161
72	Équipement pour poignée	75140161	75140161
73	Vis	-	-
77	Bande de serrage pour vitre	79074200	79074200
78	Vis	-	-
80	Vis	-	-
81	Tube d'éloignement	542635	542635
82	Plaque arrière à conv.	54201221	54201221
84	Vis	-	-
85	Vis	-	-
86	Poignée bakélite 36 mm	79118300	79118300
87	Rondelle	-	-
88	Panneau latéral Ecureuil conv.	-	44204121
89	Vis	-	-

Enregistrement de la garantie du produit

CERTIFICAT DE GARANTIE 10 ANS MORSØ

Chaque produit Morsø est le résultat de plus de 160 années d'expérience de la conception et de la fabrication des poêles à bois. Le contrôle de la qualité a toujours été la clé de voûte de notre processus de production. Des mesures rigoureuses ont été mises en place à chaque étape clé. Par conséquent, lorsqu'un poêle est fourni par un revendeur Morsø agréé, Morsø offre une garantie de dix ans contre tous les défauts de fabrication sur tous les principaux composants extérieurs de ses poêles.

Pour en savoir plus sur la «garantie de 10 ans Morsø / carte d'enregistrement de produit» et enregistrer votre nouveau poêle Morsø en ligne, allez sur le site:
<http://international.morsoe.com/warranty-registration>

Morsø Jernstøberi A/S - 14.04.2020 - 72208400

IMPORTANT!

Comment chauffer en toute sécurité pour l'environnement et pour vous-même!

- **Utiliser uniquement du bois sec**

Utiliser uniquement du bois sec (teneur en humidité max. de 20%) et non traité. Le combustible doit être coupé en deux et faire de 8 à 12 cm d'épaisseur.

- **Allumer**

Allumer avec du bois d'allumage sec (utiliser 1 - 2 kg). Laisser la porte entrouverte et rester à proximité du poêle pendant la phase d'allumage.

- **Obtenir une bonne couche de braises**

S'assurer d'avoir une bonne couche de braises avant d'alimenter le feu. Le bois doit s'allumer en 2 minutes. Si les bûches ne s'allument pas, dans des circonstances extrêmes, cela peut provoquer l'allumage des gaz de combustion, ce qui présente un risque de dommages matériels et de préjudices corporels.

- **Alimenter le feu**

Pour alimenter le feu, utiliser 2 ou 3 morceaux de bois (pas plus de 2 - 2,5 kg).

- **Garantir une ventilation adéquate**

C'est-à-dire des flammes claires et jaunes.

- **Ne jamais laisser brûler toute la nuit**



By appointment to The Royal Danish Court

morsø

Morsø Jernstøberi A/S - 14.04.2020 - 72208400

Annex 28

Title: Sample analysis data

Pages total: 4, excl this cover page

Sample analysis, HF1 (#1), 5. February 2020

Sample analysis, test run #1			
Filter series:	(1-4)	3	
Gasket series:	(1-4)	3	
Probe series:	(A-B-C)	C	
	PRIOR (mg)	FINAL (mg)	
Main train probe	121223,2	121223,9	Main train
Filters 1+2	163,8	164,9	
Gaskets 1+2	4898,7	4900,1	
Split train probe 1H	120216,3	120216,6	Split train, 1. hour
Filters 3+4	172,3	174,1	
Gaskets 3+4	4896,1	4896,6	
Split train probe remaining	121051,1	121051,8	Split train, remaining time
Filters 5+6	170,0	170,8	
Gaskets 5+6	4968,7	4968,9	
Room probe	-	-	Room blanc
Filter 7	166,3	165,8	
Gasket 7	2457,2	2457,6	

Gasmeter	Main train (nl)	Spil train (nl)
Start of test	84111,09	88462,84
At the first hour		88867,60
End of test	84792,23	89147,34

Sample analysis, LF (#2), 5. February 2020

Sample analysis, test run #2			
Filter series:	(1-4)	4	
Gasket series:	(1-4)	1	
Probe series:	(A-B-C)	A	
	PRIOR (mg)	FINAL (mg)	
Main probe	119805,9	119806,2	Main train
Filter 1+2	190,0	189,2	
Gasket 1+2	4897,0	4898,8	
Split probe 1H	120122,1	120122,6	Split train, 1. hour
Filter 3+4	190,2	190,1	
Gasket 3+4	4909,5	4910,4	
Split probe remaining	120594,5	120594,5	Split train, remaining time
Filter 5+6	190,1	188,8	
Gasket 5+6	4954,4	4955,8	
Room probe	-	-	Room blanc
Filter 7	165,9	165,6	
Gasket 7	2482,9	2483,2	

Gasmeter	Main train (nl)	Spil train (nl)
Start of test	84792,23	89147,34
At the first hour		89542,12
End of test	87361,08	91705,92

Sample analysis, HF2 (#3), 6. February 2020

Sample analysis, test run #3			
Filter series:	(1-4)	2	
Gasket series:	(1-4)	2	
Probe series:	(A-B-C)	B	
	PRIOR (mg)	FINAL (mg)	
Main probe	120160,5	120160,6	Main train
Filter 1+2	173,6	176,5	
Gasket 1+2	4906,9	4907,7	
Split probe 1H	120027,1	120027,1	Split train, 1. hour
Filter 3+4	167,6	170,1	
Gasket 3+4	4885,7	4886,1	
Split probe remaining	120684,2	120684,2	Split train, remaining time
Filter 5+6	169,1	170,2	
Gasket 5+6	4917,0	4917,1	
Room probe	-	-	Room blanc
Filter 7	166,3	165,7	
Gasket 7	2472,8	2473,4	

Gasmeter	Main train (nl)	Spil train (nl)
Start of test	87427,09	91772,30
At the first hour		92179,01
End of test	88140,50	92486,16

Sample analysis, MF (#4), 6. February 2020

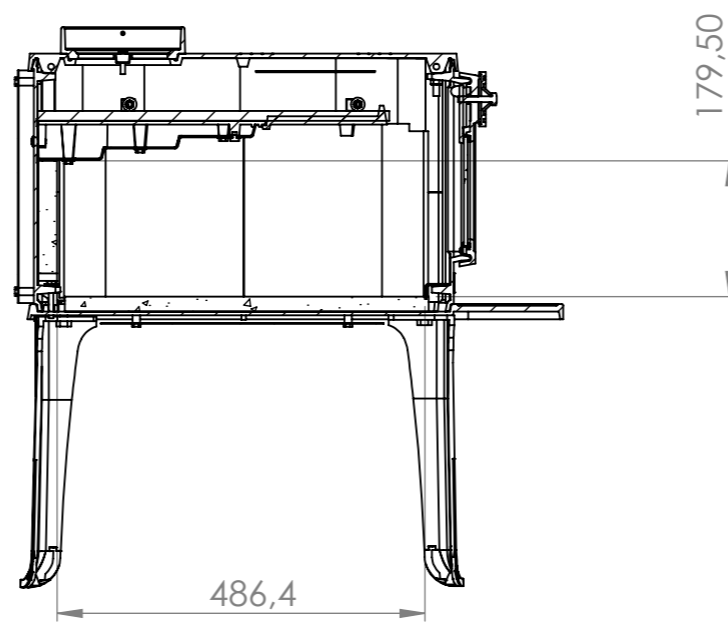
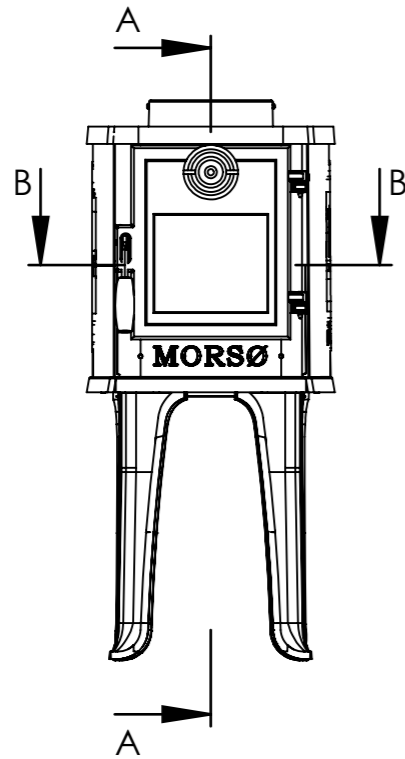
Sample analysis, test run #4			
Filter series:	(1-4)	3	
Gasket series:	(1-4)	3	
Probe series:	(A-B-C)	C	
	PRIOR (mg)	FINAL (mg)	
Main probe	121224,4	121224,4	Main train
Filter 1+2	172,6	173,4	
Gasket 1+2	4898,6	4898,8	
Split probe 1H	120717,7	120717,7	Split train, 1. hour
Filter 3+4	173,9	174,5	
Gasket 3+4	4896,6	4896,6	
Split probe remaining	121052,2	121052,2	Split train, remaining time
Filter 5+6	174,4	174,2	
Gasket 5+6	4969,0	4969,5	
Room probe	-	-	Room blanc
Filter 7	165,7	165,2	
Gasket 7	2457,4	2457,9	

Gasmeter	Main train (nl)	Spil train (nl)
Start of test	88140,50	92486,16
At the first hour		92880,12
End of test	90081,55	94434,24

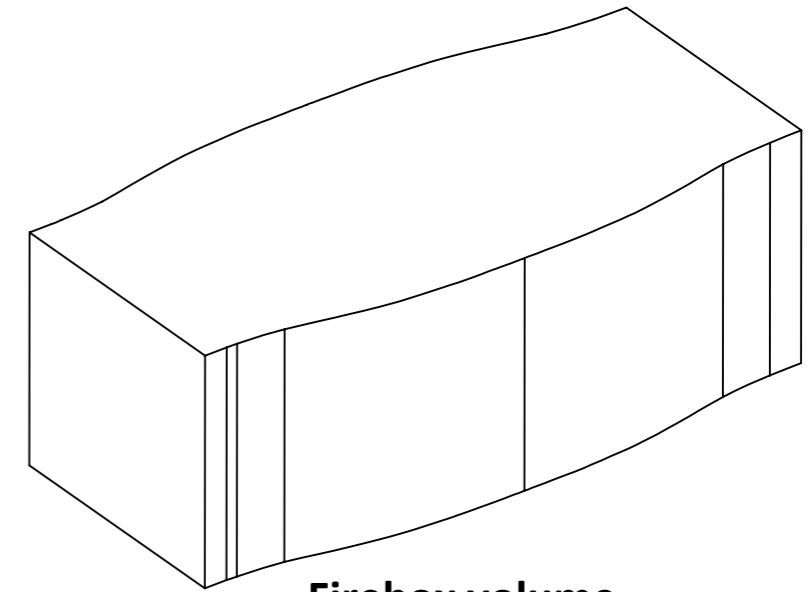
Annex 29

Title: Firebox drawing with volume indication

Pages total: 1, excl this cover page



SECTION A-A

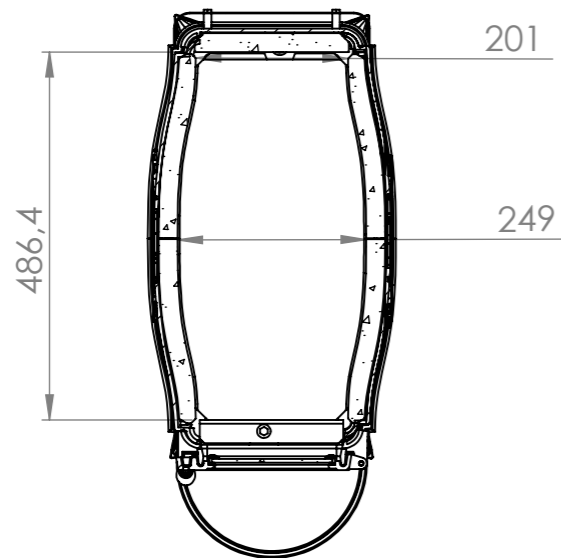


Firebox volume

0.0196082 m³

0.692460 ft³

(SolidWorks CAD calculation)



SECTION B-B

Firebox width: side insulation stone to side insulation stone

Firebox height: hearth to top end of back insulation stone

Firebox depth: back insulation stone to front door frame

Dim. without indication of margin acc. to DS/ISO 2768-1 m		Title: Morsø 2B Standard Firebox volume	Construction:	FjN	27.01.2020
Material:			Released:		
Weight kg:			Format:	A3	
Model no.:			Scale:	1:10	
Drawingtype:			Itemno.:		
Location of file:			Drawing no.:	2B-143	

This drawing is Morsø Jernstøberi A/S' property and must not be sold, lended or copied without any written authorization from the company.

Annex 30

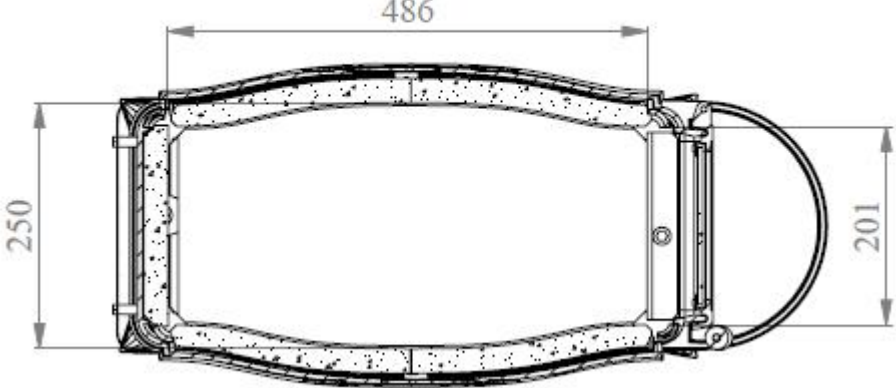
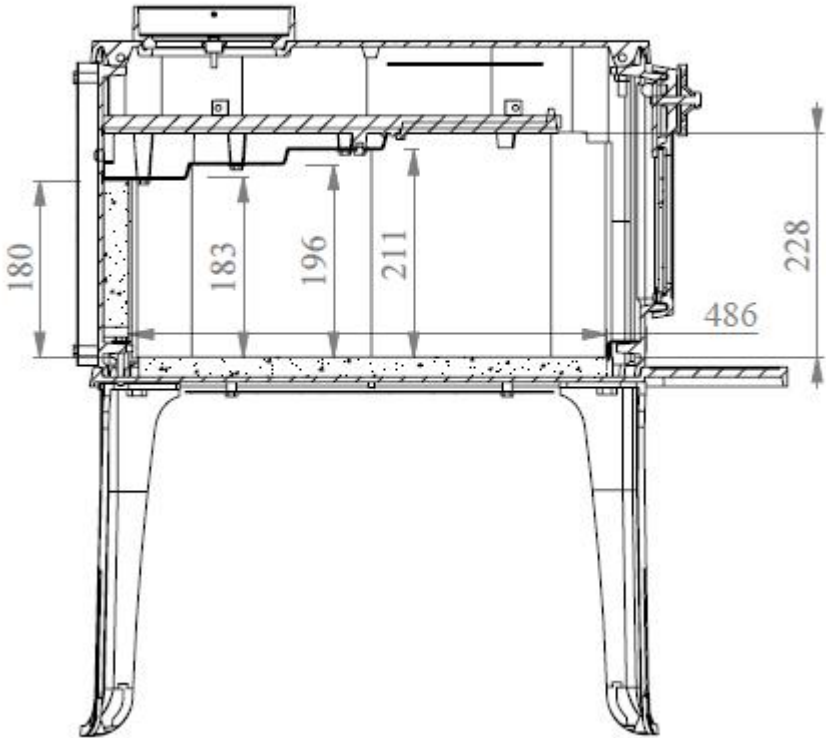
Title: Quality Assurance Plan, Morsø 2B Standard 2020

Pages total: 8, excl this cover page

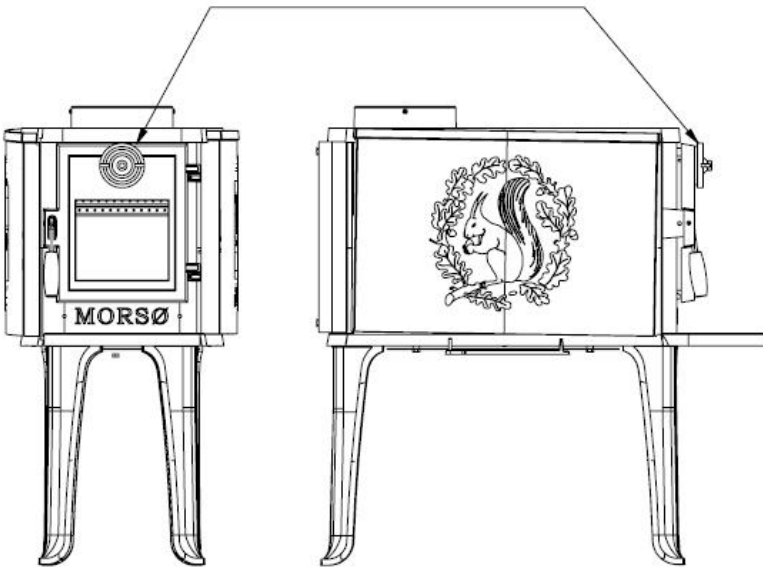
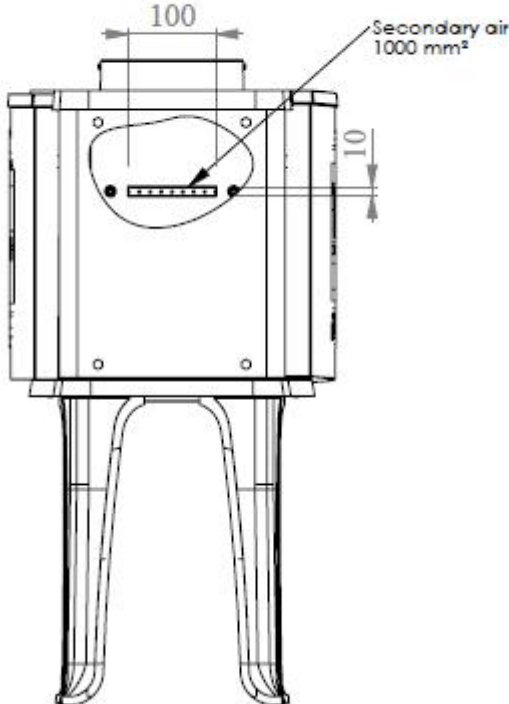
Quality Assurance Plan 2B Standard 2020

Product:	Morsø 2B Standard 2020 woodstove
Description and information:	<p>Quality Assurance Plan is a plan for assuring the quality for products, tested according to NSPS by taking measurements and checks of some key components, referred to as K-list components. For the Morsø 2B Standard 2020 woodstove the K-list components include:</p> <ul style="list-style-type: none"> (i) Firebox: Dimensions. (ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location and method of control. (iii) Baffles: Dimensions and locations. (iv) Refractory/insulation: Dimensions and location. (v) Catalyst: Dimensions and location; N/A (vi) Catalyst bypass mechanism and catalyst bypass gap tolerances (when bypass mechanism is in closed position): Dimensions, cross-sectional area, and location; N/A (vii) Flue gas exit: Dimensions and location. (viii) Door and catalyst bypass gaskets: Dimensions and fit. (ix) Outer thermal shielding and thermal coverings: Dimensions and location. (x) Fuel feed system: For wood heaters that are designed primarily to burn pellet fuel or wood chips and other wood heaters equipped with a fuel feed system, the fuel feed rate, auger motor design and power rating, and the angle of the auger to the firebox; and N/A (xi) Forced air combustion system: For wood heaters so equipped, the location and horsepower of blower motors and the fan blade size. N/A
Procedure:	<p>For each K-list component measurements will be taken according to an attached drawing, where dimensions are outlined. For (viii) the gaskets will be controlled that they are from the right supplier and have the correct size according to inventory list.</p>
Tools needed:	Rulers/measuring tapes and Caliper rule. All measurements in millimeters.
Quality check frequency	Minimum once per production run or once every 100 stoves, whichever is less.

(i) Firebox: Dimensions

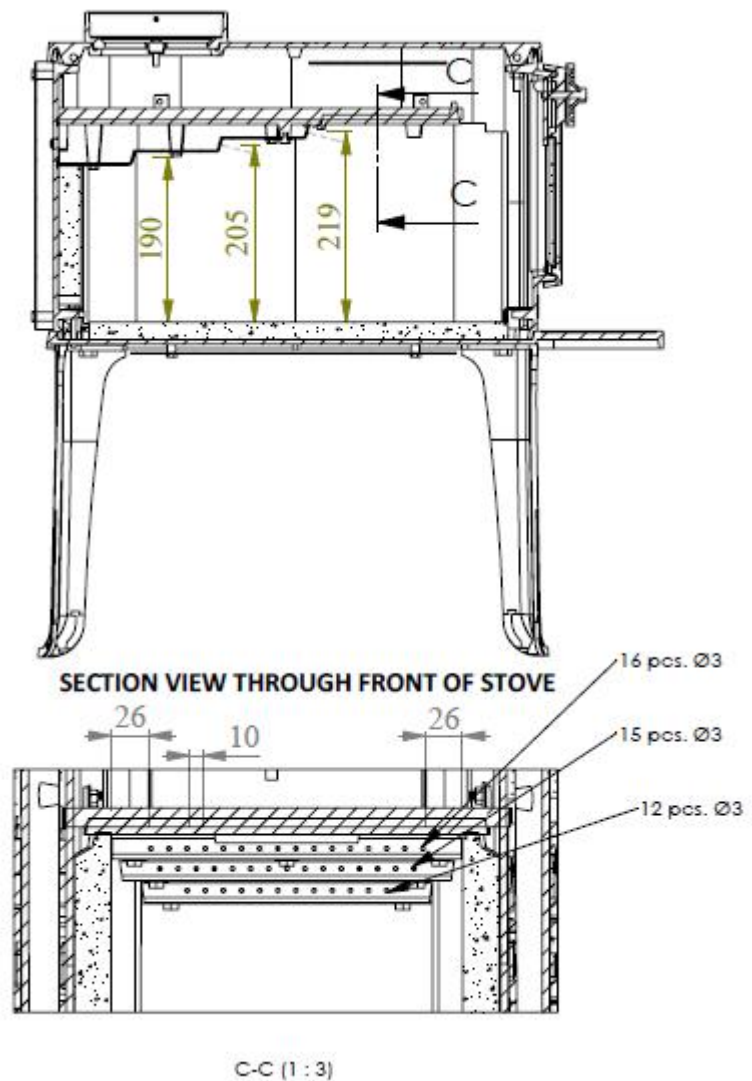
<p>Register measurement of</p> <ul style="list-style-type: none"> • Maximum and minimum width of firebox • Maximum depth of firebox hearth 	<p style="text-align: center;">SECTION VIEW THROUGH TOP</p> 
<p>Register measurement of</p> <ul style="list-style-type: none"> • Height of side brick lining • Height of back brick lining • Height measured from hearth to lowest point of the three-step, tiered hollow baffle • Maximum depth of firebox, rear brick to front frame shield 	<p style="text-align: center;">SECTION VIEW THROUGH TOP</p> 

(ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location and method of control

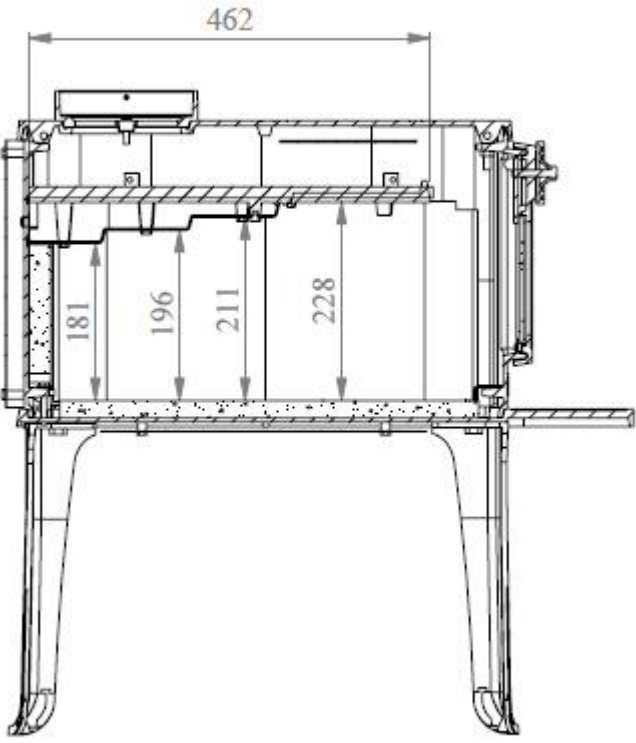
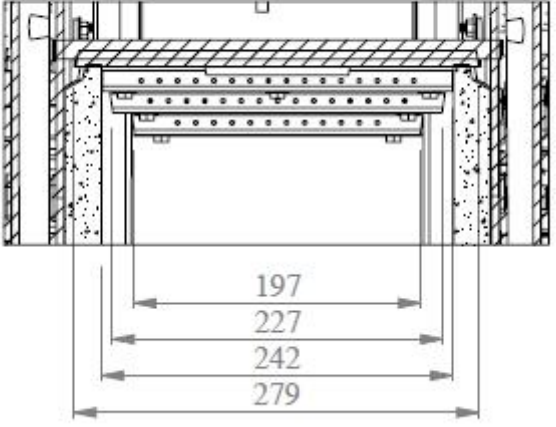
<p>Register measurement of</p> <ul style="list-style-type: none"> • Maximum primary air inlet 3.25 turns \approx 4 mm. gap between spinner and frame (\approx 919 mm²) • Minimum primary air inlet 0.75 turn \approx 1mm. gap between spinner and frame (\approx 212 mm²) 	<p>Primary Air Max.: 3.25 turns \approx 4 mm. gap between spinner and frame \approx 919 mm² Min.: 0.75 turn \approx 1mm. gap between spinner and frame \approx 212 mm²</p> 
<p>Register measurement of</p> <ul style="list-style-type: none"> • Secondary air inlet. Fixed. Rectangular 10 x 100 mm hole 	<p>BROKEN-OUT SECTION VIEW BACK</p> 

Register measurement of

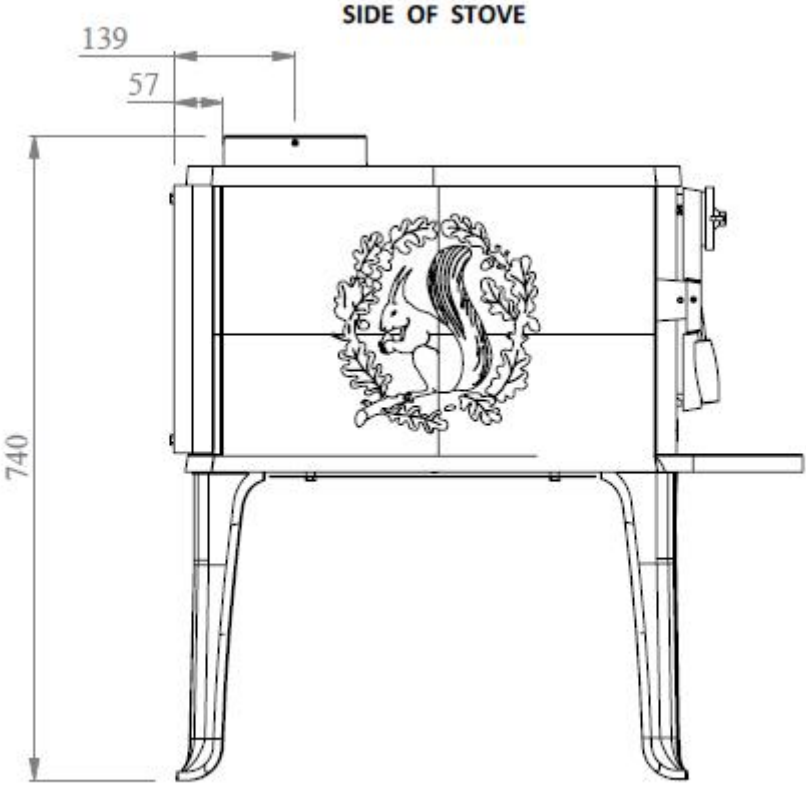
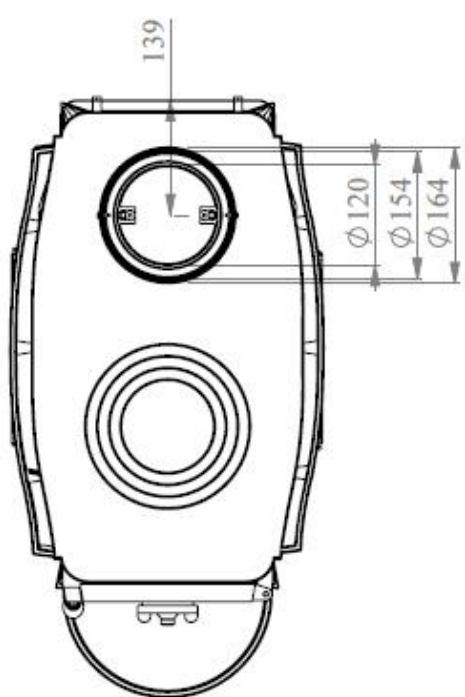
- Secondary air supplying baffle Location and number of nozzles holes



(iii) Baffles: Dimensions and locations

<p>Register measurement of</p> <ul style="list-style-type: none"> • Horizontal length of baffle • Vertical location height(s) of baffle measured from hearth 	<p style="text-align: center;">SECTION VIEW THROUGH SIDE OF STOVE</p> 
<p>Register measurement of</p> <ul style="list-style-type: none"> • Width(s) of baffle 	<p style="text-align: center;">SECTION VIEW THROUGH FRONT OF STOVE</p> 

(vii) Flue gas exit: Dimensions and location

<p>Register measurement of</p> <ul style="list-style-type: none"> • Location of spigot 	<p style="text-align: center;">SIDE OF STOVE</p> 
<p>Register measurement of</p> <ul style="list-style-type: none"> • Horizontal location of spigot • Measurement of flue outlet diameter, $\varnothing 164$ (outer), $\varnothing 154$ (inner), $\varnothing 120$ (passage) 	<p style="text-align: center;">TOP OF STOVE</p> 

(viii) Door and catalyst bypass gaskets: Dimensions and fit

Register that the used gaskets robes are correct sized and of same fabric according to the inventory list.

No measurements.

The Gasket robe are bought from external supplier with own quality control.

(ix) Outer thermal shielding and thermal coverings: Dimensions and location

<p>Register measurement of</p> <ul style="list-style-type: none"> • Lengths of radiation shields • Distances from radiation shield to stove • Thickness of shields 	<p style="text-align: center;">SECTION VIEW THROUGH SIDE</p>
<p>Register measurement of</p> <ul style="list-style-type: none"> • Width of radiation shields 	<p style="text-align: center;">BOTTOM VIEW</p>