



Instytut Badań Inżynierii Mechanicznej, Brno, Republika Czeska
Institut Testův Inženýrských, 'uöllc Enterprise, Republika Czeska

CERTYFIKAT Z TESTU

NUMER
Liczb O-B-00058-24

Výrobce - producent BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Republika Czeska - Czechy

Výrobek - Produkt Kocioł ciepłej wody

Oznaczenie typu - Oznaczenie typu BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33

Wymogi dotyczące ekoprojektu - Wymogi dotyczące ekoprojektu Rozporządzenie Komisji (UE) nr 2015/1189, załącznik II,
art. 1 Rozporządzenie Komisji (UE) nr 2015/1189, załącznik II,
art. 1 Rozporządzenie Komisji (UE) nr 2015/1187
Rozporządzenie Komisji (UE) nr 2015/1187

Metoda badania - Metoda badania EN 303-5+A1:2023

Metoda ogrzewania Podręcznik - Podręcznik

Preferowane paliwo Drewno - Drewno

Wyniki - Wyniki

Typ - typ		BLAZE GREEN 10	BLAZE GREEN 18	BLAZE GREEN 26	BLAZE GREEN 33
Wyjście nominalne - Wyjście nominalne					
CO (10% Oz)	mg/m ³	123	28	25	35
OGC (10% Oz)	mg/m ³	4	1	2	5
Pył - Dust (10% Oz)	mg/Mn ³	21 / 2.1*)	17 / 1.9*)	20 / 2.0*)	16 / 1.6*)
NOx (10% Oz)	MQ/Mn ³	115	156	149	173
Wydajność - E/iciency	%	93.0	91.5	92.2	93.3
Przydatna wydajność	%	85.4	83.9	84.5	85.7

Zmniejszona wydajność - Minimalna wydajność

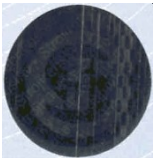
CO (10% 2)	ITILJ/III ³	523	157	149	417
OGC (10% Oz)	mg/Mn ³	1	4	4	9
Pył - Dust (10% Oz)	mg/m ^A	9.0 / 1.9")	5 / 1.8*)	3/ 1.6*)	6.0/ 1.4\$
NOx (10% Oz)	mg/m ³	85	130	111	84
Wydajność - iE/iciency	%	92.6	92.5	92.3	93.0
Przydatna wydajność	%	85.0	84.8	84.6	86.0

*) wartość pyłu z pracy kotła z elektrofiltrem przy napięciu 30 kV

") wartość pyłu podczas pracy kotła z elektrofiltrem przy napięciu 30 kV



Engineering Test Institute, s.p., Hudcova 424/56b, 621 00 Brno, Republika Czeska
Engineering T e s t Institute, przedsiębiorstwo publiczne, Hudcova 424/56b, 621 00 Brno,
Republika Czeska



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Typ - type		BLAZE GREEN 19	BLAZE GREEN 18	BLAZE GREEN 26	BLAZE GREEN 33
Emisje sezonowe					
CO (10% Oz)	mg/m ³	463	138	131	360
OGC (10% Oz)	mg/m ³	15	3	4	8
Pył - g0sf(10% Oz)	M /ITIn ³	11 / 1.9")	6 / 1.8 *)	6 / 1,6 *)	8 / 1.4*)
NOx (10% Oz)	³	mg/ITIn 90	134	116	97
η _{son}	%	85.1	84.7	84.6	86.0
F1	%	3.0	3.0	3.0	3.0
F2	%	1.0	1.2	1.0	1.0
Efektywność energetyczna ogrzewania sezonowego/ogrzewania pomieszczeń					
η _s	%	81	81	81	82
Wskaźnik efektywności energetycznej - Wskaźnik efektywności energetycznej					
EEI		119	119	119	121
Klasa efektywności energetycznej - /Energy Efficiency Class					
		A+	A+	A+	A+

*) wartość zapylenia podczas pracy kotła z elektrofiltrem przy napięciu 30 kV

") wartość pyłu podczas pracy kotła z elektrofiltrem przy napięciu 30 kV

Podstawa wydania świadectwa zatwierdzenia Podstawa wydania certyfikatu	Nr protokołu - Nr raportu 30-16981/1/T oraz raporty uzupełniające wydane przez Laboratorium Badawcze nr 1045.1, akredytowane przez CIA o.p.s., numer certyfikatu akredytacji 523/2023 wydany przez Laboratorium Badawcze nr 1045.1, akredytowane przez CIA, Certyfikat Akredytacji nr 523/2023
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Instytut Badań Mechanicznych, s.p. niniejszym potwierdza niniejszym świadectwem badań, że przeprowadził badania i obliczenia przedmiotowego produktu z powyższymi wynikami.
Instytut Testów Inżynierskich potwierdza niniejszym certyfikatem, że przeprowadził dla danego produktu test i obliczenia z podanymi wynikami.

Brno, 2024-02-01

Milan Holomek
manager sekcji z alovacích loads
Sekcja Maria el' urřadzeř do spalania



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Strojírenský zkušební ústav, s.p., Brno, Česká republika
Engineering Test Institute, Public Enterprise, Czech Republic

OSVĚDČENÍ O ZKOUŠCE CERTIFICATE OF TEST

Číslo
Number **O-B-00058-24**

Výrobce – Manufacturer

BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Česká republika – Czech Republic

Výrobek – Product

Kotel teplovodní – Hot-water boiler

Typové označení – Type designation

**BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33**

Požadavky na ekodesign – Ecodesign requirements

Nařízení Komise (EU) č. 2015/1189, příloha II, čl. 1
Commission Regulation (EU) No. 2015/1189, Annex II, Art. 1
Nařízení Komise (EU) č. 2015/1187
Commission Regulation (EU) No. 2015/1187

Metoda zkoušek – Test method

ČSN EN 303-5+A1:2023

Způsob topení – Heating method

Ruční – Manual

Preferované palivo – Preferred fuel

Dřevo – Wood

Výsledky – Results

Typ – type

	BLAZE GREEN 10	BLAZE GREEN 18	BLAZE GREEN 26	BLAZE GREEN 33
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Jmenovitý výkon – Nominal output

CO (10% O ₂)	mg/m ³	123	28	25	35
OGC (10% O ₂)	mg/m ³	4	1	2	5
Prach – Dust (10% O ₂)	mg/m ³	21 / 2.1*)	17 / 1.9*)	20 / 2.0*)	16 / 1.6*)
NO _x (10% O ₂)	mg/m ³	115	156	149	173
Účinnost – Efficiency	%	93.0	91.5	92.2	93.3
Užitečná účinnost – Useful efficiency	%	85.4	83.9	84.5	85.7

Snižovaný výkon – Minimal output

CO (10% O ₂)	mg/m ³	523	157	149	417
OGC (10% O ₂)	mg/m ³	17	4	4	9
Prach – Dust (10% O ₂)	mg/m ³	9.0 / 1.9*)	5 / 1.8*)	3 / 1.6*)	6.0 / 1.4*)
NO _x (10% O ₂)	mg/m ³	85	130	111	84
Účinnost – Efficiency	%	92.6	92.5	92.3	93.6
Užitečná účinnost – Useful efficiency	%	85.0	84.8	84.6	86.0

*) hodnota prachu při provozu kotle s elektrostatickým odlučovačem při 30 kV

*) value of dust during operation of the boiler with electrostatic precipitator at 30 kV





Typ – type

BLAZE GREEN
10

BLAZE GREEN
18

BLAZE GREEN
26

BLAZE GREEN
33

Sezonní emise – Seasonal emissions

CO (10% O ₂)	mg/m ³	463	138	131	360
OGC (10% O ₂)	mg/m ³	15	3	4	8
Prach – Dust (10% O ₂)	mg/m ³	11 / 1.9*)	6 / 1.8 *)	6 / 1,6 *)	8 / 1.4*)
NOx (10% O ₂)	mg/m ³	90	134	116	97
η _{son}	%	85.1	84.7	84.6	86.0
F1	%	3.0	3.0	3.0	3.0
F2	%	1.0	1.2	1.0	1.0

Sezonní energetická účinnost – Seasonal space heating energy efficiency

η _s	%	81	81	81	82
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Index energetické účinnosti – Energy Efficiency Index

EEI		119	119	119	121
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Třída energetické účinnosti – Energy Efficiency Class

A+	A+	A+	A+
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*) hodnota prachu při provozu kotle s elektrostatickým odlučovačem při 30 kV

*) value of dust during operation of the boiler with electrostatic precipitator at 30 kV

Podklad pro vydání osvědčení
Basis for Certificate issue

Protokol č. - Report No.
30-16981/1/T a protokoly navazující - and follow-up reports,
vydané Zkušební laboratoří č. 1045.1, akreditovanou ČIA o.p.s.,
číslo osvědčení o akreditaci 523/2023
issued by Testing Laboratory No. 1045.1, accredited by CAI,
Accreditation Certificate No. 523/2023

Strojírenský zkušební ústav, s.p. tímto osvědčením o zkoušce potvrzuje, že u předmětného výrobku provedl zkoušky a výpočty s výše uvedenými výsledky.

The Engineering Test Institute certifies by this Certificate of Test to have conducted for the given product the test and calculation with above stated results.

Brno, 2024-02-01



Milan Holomek
manažer sekce spalovacích zařízení
Section Manager of Combustion Equipment

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Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic

www.szutest.cz



Testing Laboratory 1045.1

accredited by the Czech Accreditation Institute pursuant to ČSN EN ISO/IEC 17025:2018

Strojírenský zkušební ústav, s.p. Zkušební laboratoř
(Engineering Test Institute, Public Enterprise, Testing Laboratory)

Hudcova 424/56b, Medlánky, 621 00 Brno

Workplace Brno, Hudcova 424/56b, Medlánky, 621 00 Brno

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REPORT on Initial Product Type Testing **30-16981/1/T**

Product: Wood gasification hot-water boilers with manual fuel supply

Type designation: BLAZE GREEN xx

Customer: BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Czech Republic
Company ID No.: 27816273

Manufacturer: BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Czech Republic

Responsible employee: Ing. Vladimír Foit

Report issue date: 2024-01-11

Distribution list: 1 copy to the Customer
1 copy to the Engineering Test Institute

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SP-2021-000011_1_10

I. Description of product tested

The boiler BLAZE GREEN is based on the principle of a two-stage combustion, whereby the fuel gasification process is followed by combustion of the gases formed.

The boiler body is a weldment of 3-8 mm steel sheets. The fuel chamber walls are provided with a protective steel jacket, consisting of several segments joined together with lock joints. In the lower part, the lateral walls of the combustion chamber are lined with refractory sheet. The combustion chamber bottom is funnel-shaped and it is lined with ceramic blocks. A nozzle opens through a combiner into the combustion chamber, which is also lined with ceramic blocks. Boilers 26 and 33 kW dispose of two nozzles. The heat exchange surfaces of the boiler are formed by the side walls of the combustion chamber and by the rear tube exchanger. The lower door of the boiler contains a peephole with ceramic glass. The upper stoking door is equipped with a safety lock to ensure any opening position.

In the front part of the boiler under the front cover, there is an air distribution panel. In its lower part, there are 3 supply openings of the combustion air, equipped with flaps. The openings are equipped with a movable shield for regulating the ratio of secondary air. In the combustion chamber there is a permanent heat layer detection arm with an axis turning in the front wall of the combustion chamber. The detection arm is tightly connected to the balancing arm placed in the area of the air distribution panel. Under the balancing arm, there is a permanent heat detection sensor. The arm lock is a mechanism consisting of a pressure arm and a compression spring.

The rear combustion exchanger contains turbulators. The entrance water embouchures lead into a downtake channel equipped with a discharge opening with a thermostat, which regulates the amount of water entering the switchboard, from which water enters the boiler water area through small openings. The inlet water temperature control thermostat is placed in the entrance embouchure.

The boiler is equipped with a cooling loop for emergency cooling, with an entrance and exit embouchure and a sink for a safety cooling fitting sensor.

The regulator control panel is placed on the upper door. The regulating unit as such and the flue gas fan are placed on the rear wall of the boiler.

The boiler is insulated with a 30 mm mineral fibre layer. The boiler external casing is made of steel sheet.

The boiler flue gas connector is equipped with an electrostatic dust separator, type Oeko Solve OT – I 200, with a high-voltage module of 30 kV.

All detailed descriptions of individual boiler component part assemblies are included in the enclosed technical documentation to Tasks 30-15928 and 30-16981.

II. Sample tested

Table 1

Boiler output version	Nominal output [kW]	Minimum output [kW]	Fuel	Place of testing
BLAZE GREEN 10	10.0	5.0	Wood (ČSN EN ISO 17225-5:2022)	BLAZE HARMONY s.r.o. Trnávka 37 751 31 Lipník nad Bečvou VII, SZÚ Brno
BLAZE GREEN 18	18.0	9.0		
BLAZE GREEN 26	26.0	13.0		
BLAZE GREEN 33	32.5	16.0		

Sample(s) tested:

- Number of samples: 4
- Submission date: 2022-02-09, 2023-12-04
- Registration number: -
- Serial number: prototyp1, prototyp2, prototyp3, prototyp4

Visual inspection, tests and verifications of samples BLAZE GREEN 18 and BLAZE GREEN 26 were carried out at BLAZE HARMONY s.r.o., Trnávka 37, 751 31 Lipník nad Bečvou VII, Czech Republic, and at SZU Test Station in 01 - 02/2022 by Bc. Petr Matoušek a Ing. Pavel Fojtů.

Visual inspection, tests and verifications of samples BLAZE GREEN 10 and BLAZE GREEN 33 were carried out at BLAZE HARMONY s.r.o., Trnávka 37, 751 31 Lipník nad Bečvou VII, Czech Republic, by the technicians Ing. Stanislav Buchta (in August 2023) and Ing. Vladimír Foit (in December 2023).

The tests were performed using measuring and testing equipment with valid calibration.

III. Measuring and test equipment

Table 2

No.	Description	Inventory number	Calibration valid until	Accuracy
1.	Analyser of emissions Horiba, type ENDA-680P	022394	calibration before each measurement	see CRM 190/16 see CRM 103000414644
2.	Platform scale	022331	03/2025	see 6051-KL-H0317-23
3.	Induction flow meter	MaR10_Pr1	08/2026	see 6015-KL-P0612-22
4.	A kit for temperature measurement	022435/T1	06/2025	see KL-T-0109-22
5.	Thermometer, hygrometer	116258	11/2024	see 9640/2021
6.	Station barometer	111985	05/2024	see 6013-KL-K0005-19
7.	Digital pressure gauge – draught gauge	MaR11-Tah	08/2025	see KL-P-0086-23
8.	Electronic stopwatch	990760	11/2025	see 2955E-20
9.	Gravimat SHC 501	022328	06/2024	see KL-P-0039-21
10.	Analytical scale Sartorius	021682	03/2025	see 6051-KL-H0313-23
11.	Electronic thermometer THERM 3280-8M	022320/7	08/2024	see KL-T-0080-21
12.	Electric meter	022389-A/4	05/2025	see 039/15/E
13.	Induction water meter	116238	04/2024	see Q0216/2018
14.	Electromechanical scale	022151	03/2025	6051-KL-H0328-23
15.	Electromechanical scale	022211	03/2025	see 6051-KL-H0321-23
16.	Tape measure	ME 477	10/2027	see 8800/2022

Accredited test
number:

1.1* Test title: **Test of strength and tightness of pressurized components**

Test method:

ČSN EN 303-5+A1:2023
Art. 5.4, 5.4.1, 5.4.2

Sample tested:

BLAZE GREEN 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Pressure test for boilers of sheet or sheet metal of non-ferrous metal	ČSN EN 303-5+A1:2023 Art. 5.4		
Tests to be carried out before production The type test pressure is $2 \times PS$ using hydraulic pressure where PS is the maximum permissible operating pressure. The test period shall be at least 10 min and if it is to apply to a range of boilers, the test shall be carried out on at least 3 boiler sizes (smallest, medium, and largest size). No leakage or noticeable permanent deformation shall occur during the test. A record shall be made of the test, including the following details: - exact description of the boiler tested by stating the drawing number; - test pressure in bar and duration of the test; - test result; - place and date of the test, including the names of the persons carrying out the test. The test report shall be signed by, as a minimum, the works tester responsible and one witness.	ČSN EN 303-5+A1:2023 Art. 5.4.1	+ + + + + +	
Test during production Each boiler shall be tested during the production and the test pressure shall be at least $1,43 \times PS$.	ČSN EN 303-5+A1:2023 Art. 5.4.2	+	Attached technical documentation

Measurement results: BLAZE GREEN 33 – Wood

Date of test

2023-12-07

Ambient conditions

24.1

Temperature [°C]

22.9

Relative humidity [%]

98.9

Barometric pressure [bar]

Maximum operating pressure [MPa]	Required testing pressure [MPa]	Set testing pressure [MPa]	Testing medium	Test duration [min]
0.30	0.60	0.61	Water	30

Accredited test
number:

1.1* Test title: **Test of the waterside resistance of the boiler**

Test method: ČSN EN 303-5+A1:2023 Art. 5.10

Sample tested: BLAZE GREEN 18, BLAZE GREEN 26

Measuring equipment used: Chapter III - Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
Determination of the waterside resistance The water side resistance (measured in mbar) shall be determined for the flow which is equivalent to the rated output of the boiler at a temperature difference of 10 K and 20 K between the flow and return.	ČSN EN 303-5+A1:2023 Art. 5.10	+	

Note:

- + Compliant
- Non-compliant
- 0 Not applicable

Measurement results: BLAZE GREEN 18

No.	Q	ΔP
[-]	[m ³ ·h ⁻¹]	[mbar]
Temperature difference 20 K	0.771	1.65
Temperature difference 10 K	1.543	6.14

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN 26

No.	Q	ΔP
[-]	[m ³ ·h ⁻¹]	[mbar]
Temperature difference 20 K	1.114	1.19
Temperature difference 10 K	2.229	4.75

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

1.1* Test title: **Test of leakage of boilers**

Measuring equipment used: Chapter III - Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
<p>Leakage of boilers category 1</p> <p>For boilers designed to operate with a positive pressure in the combustion chamber when tested in accordance with 5.16.6 and 5.18.1 at the test-pressure of 1,2 times the gas side resistance at nominal heat output, the leakage rate based on mass flow shall not exceed 2 % of the flue gas mass flow at the nominal heat output.</p> <p>The gas side resistance shall be determined for manual stoked boilers with the fuel chamber filled to maximum capacity (as specified by the manufacturer).</p> <p>These requirements are fulfilled for positive pressure boilers category 3.</p> <p><i>NOTE For boilers designed to operate with negative pressure, the leakage rate measured according to 5.6 characterizes the boiler.</i></p>	<p>ČSN EN 303-5+A1:2023 Art. 4.3.8</p>	+	
<p>Test for gas side leakage</p> <p>This test is for boilers with a positive pressure in the combustion chamber (category 1) and boilers category 2 and 3.</p> <p>The actual leakage rate of the boiler is determined using air at ambient temperature and using a test rig in accordance with (for example) Figure 2.</p> <p>Exhaust connection and connection to the fuel line shall be sealed tightly for boilers category 1, and the doors set as in normal use. The test rig is connected to the air input of the test boiler. For boilers category 2 and 3 the joint to the air supply duct and flue gas evacuation system shall be part of leakage test setup.</p> <p>The leakage rates measured are to be converted in accordance with the standard test condition (0 °C, 1 013 mbar). The requirements of 4.2.5.2 or 4.3.8 shall be met.</p> <p>The test shall be performed after safety and performance test (5.7 to 5.18).</p> <p><i>NOTE The test for boilers category 1 operating with negative pressure can be performed under a pressure of 20 Pa (see Figure 2, measuring point 10).</i></p>	<p>ČSN EN 303-5+A1:2023 Art. 5.16.6</p>	<p>0</p> <p>+</p>	<p>Category 1, operating at negative pressure</p>

+	Requirement fulfilled
-	Requirement not fulfilled
0	Not applicable

Accredited test
number:

1.1* Test title: **Surface temperature test**

Test method:

ČSN EN 303-5+A1:2023
Art. 5.11, 5.16.4, 4.3.7

Sample tested:

BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Surface temperature The mean surface temperature shall be measured at nominal heat output. In order to do this, a minimum of 5 points on each boiler surface shall be measured. Under the same conditions, the critical temperatures (e.g. boiler doors, operating levers) shall be measured.	ČSN EN 303-5+A1:2023 Art. 5.11	+	
The surface temperature on the outside of the boiler (including the bottom and doors but not including the flue gas outlet and maintenance openings of natural draft boilers) shall not exceed the room temperature by more than 60 K when tested in accordance with 5.12. The requirement for the bottom is not applicable for instances when the manufacturer declares that the boiler is to be installed on a non-combustible base. When tested in accordance with 5.12, the surface temperature of operating levers and all parts which shall be touched by hand during operation of the boiler shall not exceed the room temperature by more than the following values as per EN ISO 13732-1:2008: <ul style="list-style-type: none"> – 51 K for metals and similar materials; – 56 K for porcelain and similar materials; – 60 K for plastics and similar materials. 	ČSN EN 303-5+A1:2023 Art. 4.3.7	+	
Resistance to thermal conductance Temperature measurement shall be performed on the surface of the stoking device at the place next to the fuel line but within a maximum distance which shall be less than 1 m against the feeding direction from the inner wall of the combustion chamber. For boilers with integrated hopper, the temperature measurement shall be performed on the surface of the stoking device at the place next to the integrated hopper but within a maximum distance which shall be less than 1 m against the feeding direction from the inner wall of the combustion chamber. In addition, the highest surface temperature of the hopper shall be measured.	ČSN EN 303-5+A1:2023 Art. 5.16.4	+	

Measurement results:

Average temperatures of boiler walls, doors and covers (°C):		
Boiler	BLAZE GREEN 10	
Fuel type	Wood	
Output	Nominal	Reduced
Date of test	2023-12-13	2023-12-13
Ambient temperature [°C]	24.6	24.5
Relative humidity [%]	29.0	28.8
Barometric pressure [kPa]	97.12	97.13
Front wall	38.0	31.7
Rear wall	35.3	33.8
Right wall	32.3	29.2
Left wall	32.7	30.3
Upper wall	31.0	32.0
Lower wall	49.5	41.0
Temperatures of control elements (°C):		
Upper door handle (metal)	31.0	
Lower door handle (metal)	41.0	
Primary air control (metal)	30.0	
Arresting lever (metal)	59.0	
Control unit (plastic)	31.0	
STB (plastic)	27.0	

Measurement uncertainty: 2 °C for temperatures in the range of (0 + 200)°C

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Test results: The prescribed warming values have not been exceeded.

Measurement results:

Average temperatures of boiler walls, doors and covers (°C):		
Boiler	BLAZE GREEN 18	
Fuel type	Wood	
Output	Nominal	Reduced
Date of test	2023-08-22	2023-08-22
Ambient temperature [°C]	25.3	26.3
Relative humidity [%]	43.3	43.4
Barometric pressure [kPa]	99.2	99.3
Front wall	36.2	33.0
Rear wall	41.5	39.3
Right wall	33.3	30.8
Left wall	33.4	31.2
Upper wall	35.6	31.8
Lower wall	43.9	34.9
Temperatures of control elements (°C):		
Upper door handle (metal)	32.0	
Lower door handle (metal)	40.0	
Primary air control (metal)	32.0	
Arresting lever (metal)	48.0	
Control unit (plastic)	31.0	

Measurement uncertainty: 2 °C for temperatures in the range of (0 ÷ 200)°C

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Test results: The prescribed warming values have not been exceeded.

Measurement results:

Average temperatures of boiler walls, doors and covers (°C):		
Boiler	BLAZE GREEN 26	
Fuel type	Wood	
Output	Nominal	Reduced
Date of test	2023-08-23	2023-08-23
Ambient temperature [°C]	26.4	27.1
Relative humidity [%]	47.1	47.0
Barometric pressure [kPa]	99.8	99.9
Front wall	38.7	41.7
Rear wall	39.2	35.0
Right wall	35.1	33.8
Left wall	35.1	33.8
Upper wall	32.9	32.7
Lower wall	64.1	53.8
Temperatures of control elements (°C):		
Upper door handle (metal)	32.0	
Lower door handle (metal)	43.0	
Primary air control (metal)	35.0	
Arresting lever (metal)	49.0	
Control unit (plastic)	33.0	

Measurement uncertainty: 2 °C for temperatures in the range of (0 ÷ 200)°C

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Test results: The prescribed warming values have not been exceeded.

Measurement results:

Average temperatures of boiler walls, doors and covers (°C):		
Boiler	BLAZE GREEN 33	
Fuel type	Wood	
Output	Nominal	Reduced
Date of test	2023-12-07	2023-12-04
Ambient temperature [°C]	24.1	24.9
Relative humidity [%]	22.9	20.8
Barometric pressure [kPa]	98.95	98.79
Front wall	31.0	30.3
Rear wall	37.8	37.5
Right wall	33.1	31.9
Left wall	31.0	30.1
Upper wall	30.4	29.8
Lower wall	48.5	46.5
Temperatures of control elements (°C):		
Upper door handle (metal)	31.0	
Lower door handle (metal)	41.0	
Primary air control (metal)	30.0	
Arresting lever (metal)	59.0	
Control unit (plastic)	31.0	
STB (plastic)	27.0	

Measurement uncertainty: 2 °C for temperatures in the range of (0 ÷ 200)°C

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Test results: The prescribed warming values have not been exceeded.

Accredited test number: **1.1*** Test title: **Test of heat output, input and efficiency
Test of combustion products temperature**

Test method: ČSN EN 303-5+A1:2023
Art. 4.4, 4.4.1, 4.4.2, 4.4.2.1, 4.4.2.2, 4.4.2.3, 4.4.2.4, 4.4.2.5,
4.4.3, 5.2, 5.3, 5.6 to 5.9

Sample tested: BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33

Measuring equipment used: Chapter III - Measuring and test equipment

Test results:

Average measured and calculated values (solid fuels):

Test No.:	I.	II.	III.
Boiler type:	BLAZE GREEN 10		
Date of test:	2023-12-13		2023-12-13
Output tested:	Nominal I. period	Nominal II. period	Minimum
Type of fuel:	Wood		
Combustion period (manual/automatic) fuel supply	At least 2 x 4 hours		2 hours
Nominal heat output (specified by the manufacturer) [kW]	10.0	10.0	10.0
Flue gas temperature [°C]	81.5	76.7	62.3
Fuel consumption [kg/hour]	2.500	2.425	1.241
Inlet water temperature [°C]	52.3	50.7	61.5
Outlet water temperature [°C]	72.9	70.6	71.7
Cooling water temperature [°C]	-	-	-
Cooling water volume flow [m ³ /hour]	0.4290	0.4290	0.4290
Amount of condensate [kg/hour]	-	-	-
Condensate temperature [°C]	-	-	-
Draught behind boiler [Pa]	8.6	7.5	4.6
Ambient temperature [°C]	25.1	24.6	24.5
Relative air humidity [%]	29.6	29.0	28.8
Barometric pressure [kPa]	97.21	97.12	97.13

Analysis of combustion products:

Test (combustion period) no.:	I.	II.	III.
Oxygen O ₂ [%]	7.72	8.74	10.69
Carbon dioxide CO ₂ [%]	12.92	11.76	9.70
Carbon monoxide CO [ppm]	170	58	392
Higher hydrocarbons THC/OGC [ppm]	4	1	10
Nitrogen oxides NO _x [ppm]	73	57	39
Sulphur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (combustion period) no.:	I.	II.	III.
Stoichiometric oxygen volume [m ³ /kg]	0.838	0.838	0.838
Stoichiometric air volume [m ³ /kg]	3.992	3.992	3.990
Stoichiometric volume of dry combustion products [m ³ /kg]	3.973	3.973	3.972
Maximum content of CO ₂ [%]	20.62	20.62	20.62
Stoichiometric air multiple [-]	1.58	1.71	2.03
Volume of dry combustion products – actual [m ³ /kg]	6.333	6.963	8.411
Content of H ₂ O in combustion air [m ³ /kg]	0.062	0.064	0.074
Content of H ₂ O in combustion products [m ³ /kg]	0.771	0.773	0.784
Wet combustion products mass flow rate [kg/s]	0.006	0.007	0.004

Calculated values – thermal overview:

Test (combustion period) no.:	I.	II.	III.
Loss through sensible heat of combustion [%] products (chimney)	3.5	3.5	3.0
Loss through gas underburning [%]	0.1	0.0	0.3
Loss through mechanical underburning [%]	0.1	0.1	0.1
Loss through heat transfer into environment [%]	3.0	3.1	3.8
Loss through flue gas condensation [%]	-	-	-
Total loss [%]	6.7	6.7	7.2
Efficiency – indirect method [%]	93.3	93.3	92.8
Fuel mass flow - actual [kg/hour]	2.507	2.432	1.245
Heat input [kW]	10.9	10.6	5.4
Heat output [kW]	10.1	9.8	5.0
Uncertainty of determining heat output [kW]	0.1	0.1	0.1
Output / Nominal output [%]	101.2	98.1	50.0
Efficiency – direct method [%]	93.0	92.9	92.6
Useful efficiency [%]	85.4		85.0
Seasonal efficiency [%]	85.1		
Seasonal energy efficiency [%]	81		
Energy efficiency index [-]	119		
Energy efficiency class [-]	A+		

Efficiency of boiler BLAZE GREEN 10 when burning **wood** meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Fig.1.

BLAZE GREEN 10 – Wood meets the seasonal energy efficiency conditions as per ČSN EN 303-5+A1:2023, Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;
Boiler Class 5;
Flue gas temperature at nominal output is lower than 160 K above the ambient temperature;
Combustion period is 2 x 4 hours when burning wood;

Average measured and calculated values (solid fuels):

Test No.:	I.	II.	III.
Boiler type:	BLAZE GREEN 18		
Date of test:	2023-08-22		2023-08-22
Output tested:	Nominal I. period	Nominal II. period	Minimum
Type of fuel:	Wood		
Combustion period (manual/automatic) fuel supply	At least 2 x 2 hours		2 hours
Nominal heat output (specified by the manufacturer) [kW]	18.0	18.0	18.0
Flue gas temperature [°C]	102.3	101.9	69.4
Fuel consumption [kg/hour]	4.243	4.268	2.240
Inlet water temperature [°C]	59.4	57.7	52.2
Outlet water temperature [°C]	74.0	72.4	70.2
Cooling water temperature [°C]	20.5	22.2	22.3
Cooling water volume flow [m³/hour]	1.0000	0.9999	0.4323
Amount of condensate [kg/hour]	-	-	-
Condensate temperature [°C]	-	-	-
Draught behind boiler [Pa]	7	5	6
Ambient temperature [°C]	25.2	25.3	26.3
Relative air humidity [%]	43.2	43.3	43.4
Barometric pressure [kPa]	99.2	99.2	99.3

Analysis of combustion products:

Test (combustion period) no.:	I.	II.	III.
Oxygen O ₂ [%]	10.05	10.11	11.45
Carbon dioxide CO ₂ [%]	10.19	10.03	8.82
Carbon monoxide CO [ppm]	28	17	109
Higher hydrocarbons THC/OGC [ppm]	1	1	2
Nitrogen oxides NO _x [ppm]	76	75	55
Sulphur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (combustion period) no.:	I.	II.	III.
Stoichiometric oxygen volume [m³/kg]	0.797	0.797	0.794
Stoichiometric air volume [m³/kg]	3.795	3.795	3.782
Stoichiometric volume of dry combustion products [m³/kg]	3.785	3.785	3.772
Maximum content of CO ₂ [%]	20.78	20.78	20.78
Stoichiometric air multiple [-]	1.92	1.93	2.19
Volume of dry combustion products – actual [m³/kg]	7.718	7.842	8.878
Content of H ₂ O in combustion air [m³/kg]	0.054	0.058	0.069
Content of H ₂ O in combustion products [m³/kg]	0.769	0.773	0.784
Wet combustion products mass flow rate [kg/s]	0.01295	0.01322	0.008

Calculated values – thermal overview:

Test (combustion period) no.:	I.	II.	III.
Loss through sensible heat of [%] combustion products (chimney)	5.8	5.8	3.6
Loss through gas underburning [%]	0.0	0.0	0.1
Loss through mechanical underburning [%]	0.1	0.1	0.4
Loss through heat transfer into [%] environment	2.0	2.0	3.0
Loss through flue gas condensation [%]	-	-	-
Total loss [%]	7.9	7.9	7.1
Efficiency – indirect method [%]	92.1	92.1	92.9
Fuel mass flow - actual [kg/hour]	4.259	4.284	2.251
Heat input [kW]	18.3	18.4	9.7
Heat output [kW]	16.7	16.8	8.9
Uncertainty of determining heat output [kW]	0.7	0.7	0.4
Output / Nominal output [%]	92.9	93.5	49.7
Efficiency – direct method [%]	91.5	91.5	92.5
Useful efficiency [%]	83.9		84.8
Seasonal efficiency [%]	84.7		
Seasonal energy efficiency [%]	81		
Energy efficiency index [-]	119		
Energy efficiency class [-]	A*		

Efficiency of boiler BLAZE GREEN 18 when burning **wood** meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Fig.1.

BLAZE GREEN 18 – Wood meets the seasonal energy efficiency conditions as per ČSN EN 303-5+A1:2023, Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;
Boiler Class 5;
Flue gas temperature at nominal output is lower than 160 K above the ambient temperature;
Combustion period is 2 x 2 hours when burning wood;

Average measured and calculated values (solid fuels):

Test No.:	I.	II.	III.
Boiler type:	BLAZE GREEN 26		
Date of test:	2023-08-22		2023-08-23
Output tested:	Nominal I. period	Nominal II. period	Minimum
Type of fuel:	Wood		
Combustion period (manual/automatic) fuel supply	At least 2 x 2 hours		2 hours
Nominal heat output (specified by the manufacturer) [kW]	26.0	26.0	26.0
Flue gas temperature [°C]	101.3	102.1	64.2
Fuel consumption [kg/hour]	6.115	6.120	3.185
Inlet water temperature [°C]	56.2	60.9	55.9
Outlet water temperature [°C]	76.8	81.6	70.0
Cooling water temperature [°C]	22.5	23.5	24.9
Cooling water volume flow [m ³ /hour]	1.0290	1.0289	0.7855
Amount of condensate [kg/hour]	-	-	-
Condensate temperature [°C]	-	-	-
Draught behind boiler [Pa]	11	9	6
Ambient temperature [°C]	26.2	26.5	27.1
Relative air humidity [%]	47.1	47.1	47.0
Barometric pressure [kPa]	99.8	99.8	99.9

Analysis of combustion products:

Test (combustion period) no.:	I.	II.	III.
Oxygen O ₂ [%]	7.33	7.37	9.76
Carbon dioxide CO ₂ [%]	12.85	12.64	10.37
Carbon monoxide CO [ppm]	31	19	122
Higher hydrocarbons THC/OGC [ppm]	1	1	3
Nitrogen oxides NO _x [ppm]	97	83	55
Sulphur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (combustion period) no.:	I.	II.	III.
Stoichiometric oxygen volume [m ³ /kg]	0.794	0.794	0.792
Stoichiometric air volume [m ³ /kg]	3.782	3.782	3.772
Stoichiometric volume of dry combustion products [m ³ /kg]	3.773	3.773	3.762
Maximum content of CO ₂ [%]	20.78	20.78	20.78
Stoichiometric air multiple [-]	1.53	1.54	1.87
Volume of dry combustion products – actual [m ³ /kg]	6.100	6.202	7.531
Content of H ₂ O in combustion air [m ³ /kg]	0.041	0.041	0.059
Content of H ₂ O in combustion products [m ³ /kg]	0.756	0.756	0.774
Wet combustion products mass flow rate [kg/s]	0.01512	0.01536	0.00954

Calculated values – thermal overview:

Test (combustion period) no.:	I.	II.	III.
Loss through sensible heat of [%] combustion products (chimney)	4.6	4.7	2.7
Loss through gas underburning [%]	0.0	0.0	0.1
Loss through mechanical underburning [%]	0.4	0.4	0.6
Loss through heat transfer into [%] environment	2.4	2.4	3.9
Loss through flue gas condensation [%]	-	-	-
Total loss [%]	7.4	7.5	7.3
Efficiency – indirect method [%]	92.6	92.5	92.7
Fuel mass flow - actual [kg/hour]	6.146	6.151	3.205
Heat input [kW]	26.4	26.4	13.8
Heat output [kW]	24.3	24.3	12.7
Uncertainty of determining heat output [kW]	1.0	1.0	0.5
Output / Nominal output [%]	93.5	93.6	48.8
Efficiency – direct method [%]	92.2	92.2	92.3
Useful efficiency [%]	84.5		84.6
Seasonal efficiency [%]	84.6		
Seasonal energy efficiency [%]	81		
Energy efficiency index [-]	119		
Energy efficiency class [-]	A⁺		

Efficiency of boiler BLAZE GREEN 26 when burning **wood** meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Fig.1.

BLAZE GREEN 26 – Wood meets the seasonal energy efficiency conditions as per ČSN EN 303-5+A1:2023, Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;
Boiler Class 5;
Flue gas temperature at nominal output is lower than 160 K above the ambient temperature;
Combustion period is 2 x 2 hours when burning wood;

Average measured and calculated values (solid fuels):

Test No.:	I.	II.	III.
Boiler type:	BLAZE GREEN 33		
Date of test:	2023-12-07		2023-12-04
Output tested:	Nominal I. period	Nominal II. period	Minimum
Type of fuel:	Wood		
Combustion period (manual/automatic) fuel supply	At least 2 x 3 hours		2 hours
Nominal heat output (specified by the manufacturer) [kW]	32.5	32.5	32.5
Flue gas temperature [°C]	101.3	103.8	75.8
Fuel consumption [kg/hour]	7.450	7.505	3.937
Inlet water temperature [°C]	51.8	53.7	51.8
Outlet water temperature [°C]	70.2	72.1	70.6
Cooling water temperature [°C]	-	-	-
Cooling water volume flow [m ³ /hour]	1.4360	1.4458	0.7460
Amount of condensate [kg/hour]	-	-	-
Condensate temperature [°C]	-	-	-
Draught behind boiler [Pa]	9.1	7.7	12.1
Ambient temperature [°C]	23.7	24.1	24.9
Relative air humidity [%]	24.5	22.9	20.8
Barometric pressure [kPa]	98.94	98.95	98.79

Analysis of combustion products:

Test (combustion period) no.:	I.	II.	III.
Oxygen O ₂ [%]	7.41	7.37	7.20
Carbon dioxide CO ₂ [%]	13.34	13.56	13.74
Carbon monoxide CO [ppm]	27	42	418
Higher hydrocarbons THC/OGC [ppm]	4	4	7
Nitrogen oxides NO _x [ppm]	107	102	51
Sulphur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (combustion period) no.:	I.	II.	III.
Stoichiometric oxygen volume [m ³ /kg]	0.838	0.838	0.838
Stoichiometric air volume [m ³ /kg]	3.992	3.992	3.990
Stoichiometric volume of dry combustion products [m ³ /kg]	3.973	3.973	3.972
Maximum content of CO ₂ [%]	20.62	20.62	20.62
Stoichiometric air multiple [-]	1.54	1.54	1.52
Volume of dry combustion products – actual [m ³ /kg]	6.141	6.038	5.940
Content of H ₂ O in combustion air [m ³ /kg]	0.045	0.043	0.041
Content of H ₂ O in combustion products [m ³ /kg]	0.754	0.752	0.750
Wet combustion products mass flow rate [kg/s]	0.019	0.018	0.010

Calculated values – thermal overview:

Test (combustion period) no.:	I.	II.	III.
Loss through sensible heat of combustion [%] products (chimney)	4.7	4.8	3.0
Loss through gas underburning [%]	0.0	0.0	0.2
Loss through mechanical underburning [%]	0.1	0.1	0.1
Loss through heat transfer into environment [%]	1.2	1.2	2.5
Loss through flue gas condensation [%]	-	-	-
Total loss [%]	6.0	6.1	5.8
Efficiency – indirect method [%]	94.0	93.9	94.2
Fuel mass flow - actual [kg/hour]	7.471	7.526	3.949
Heat input [kW]	32.4	32.7	17.1
Heat output [kW]	30.3	30.4	16.0
Uncertainty of determining heat output [kW]	0.3	0.3	0.2
Output / Nominal output [%]	93.2	93.5	49.2
Efficiency – direct method [%]	93.4	93.2	93.6
Useful efficiency [%]	85.7		86.0
Seasonal efficiency [%]	86.0		
Seasonal energy efficiency [%]	82		
Energy efficiency index [-]	121		
Energy efficiency class [-]	A+		

Efficiency of boiler BLAZE GREEN 33 when burning **wood** meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Fig.1.

BLAZE GREEN 33 – Wood meets the seasonal energy efficiency conditions as per ČSN EN 303-5+A1:2023, Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;
Boiler Class 5;
Flue gas temperature at nominal output is lower than 160 K above the ambient temperature;
Combustion period is 2 x 3 hours when burning wood;

Fuel analysis:

Type of fuel	Wood (BLAZE GREEN 10, 33)			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Combustion heat	Q_s	[UM/kg]	17.02	0.22
Calorific value	Q_j	[UM/kg]	15.63	0.22
Total water, in original condition	W_{r_t}	[% of mass]	12.08	0.01
Ash	A	[% of mass]	0.25	0.01
Carbon	C	[% of mass]	44.31	0.24
Hydrogen	H	[% of mass]	5.04	0.20
Nitrogen	N	[% of mass]	0.06	0.14
Sulphur	S	[% of mass]	0.019	0.001
Chlorine	Cl	[% of mass]	0.014	0.004
Oxygen, calculation for 100%	O	[% of mass]	38.23	

Note: Sample in original condition

Measurement uncertainty: Shown in the Table Measurement results

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Fuel analysis:

Type of fuel	Wood (BLAZE GREEN 16, 28)			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Combustion heat	Q_s	[UM/kg]	16.89	0.22
Calorific value	Q_j	[UM/kg]	15.45	0.22
Total water, in original condition	W_{r_t}	[% of mass]	12.00	0.01
Ash	A	[% of mass]	0.33	0.01
Carbon	C	[% of mass]	42.55	0.24
Hydrogen	H	[% of mass]	5.10	0.20
Nitrogen	N	[% of mass]	0.06	0.14
Sulphur	S	[% of mass]	0.014	0.001
Chlorine	Cl	[% of mass]	0.015	0.008
Oxygen, calculation for 100%	O	[% of mass]	39.94	

Note: Sample in original condition

Measurement uncertainty: Shown in the Table Measurement results

"The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02."

Accredited test number: **1.73*** Test title: **Electrical consumption**

Test method: ČSN EN 303-5+A1:2023 Art. 5.7.7
ČSN EN 15456:2008 Art. 5

Sample tested: BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33

Measuring equipment used: Chapter III – Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
Electrical consumption During the tests, the electrical consumption shall be determined according to EN 15456. The values for maximum consumption, for stand by, nominal heat output and minimum heat output shall be stated in the test report. For boilers with automatic feeding systems (fuel line), the electrical consumption of the boiler and the fuel line shall be determined and stated separately. The average electrical power consumption during stand by shall be measured for a minimum duration of 10 min and shall be stated in watts. In cases where control operations influence the intrinsic energy consumption, a longer duration might be necessary.	ČSN EN 303-5+A1:2023 Art. 5.7.7	+	

Measurement results: BLAZE GREEN 10 – wood

Boiler type:	BLAZE GREEN 10	BLAZE GREEN 18	BLAZE GREEN 26	BLAZE GREEN 33
Electric input at nominal output	49 W	46 W	54 W	61 W
Electric input at minimum output	26 W	43 W	57 W	47 W
Electric input for STAND BY mode	3 W	3 W	3 W	3 W

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Accredited test
number:

1.1*

Test title: **Combustion efficiency test – emissions**

Test method:

ČSN EN 303-5+A1:2023 Art. 5.6.3, 5.6.4, 5.8, 5.9.4

Sample tested:

BLAZE GREEN 10, BLAZE GREEN 18,
BLAZE GREEN 26, BLAZE GREEN 33

Measuring equipment used:

Chapter III – Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Emission limits Combustion shall be of low-emission. This requirement shall be satisfied if the emission values shown in Table 7 are not exceeded when operating at nominal heat output or, in the case of boilers with heat output range, when operating at nominal heat output and minimum heat output, determined in accordance with the requirements mentioned in 5.8 and calculated in accordance with 5.9.4.	ČSN EN 303-5+A1:2023 Art. 4.4.7.1	+	

Table 7

Fuel supply	Fuel	Nominal heat output	Emission limits								
			CO			OGC			Dust		
		kW	mg/m ³ at 10 % O ₂ ^a								
			Class	Class	Class	Class	Class	Class	Class	Class	Class
			3	4	5	3	4	5	3 ^b	4	5
Manual	Biogenic	≤ 50	5 000	1 200	700	150	50	30	150	75	60
		> 50 ≤ 150	2 500			100			150		
		> 150 ≤ 500	1 200			100			150		
	Fossil	≤ 50	5 000			150			125		
		> 50 ≤ 150	2 500			100			125		
		> 150 ≤ 500	1 200			100			125		
Automatic	Biogenic	≤ 50	3 000	1 000	500	100	30	20	150	60	40
		> 50 ≤ 150	2 500			80			150		
		> 150 ≤ 500	1 200			80			150		
	Fossil	≤ 50	3 000			100			125		
		> 50 ≤ 150	2 500			80			125		
		> 150 ≤ 500	1 200			80			125		

NOTE The dust values in this Table are based on the experience of the gravimetric filter method. The method used needs to be referred to in the test report. The particulate matter emission measured according to this European Standard does not include condensable organic compounds which may form additional particulate matter when the flue gas is mixed with ambient air. The values are therefore not directly comparable with values measured by dilution tunnel methods. Neither can they be directly translated into ambient air particulate concentrations.

^a Referred to dry exit flue gas, 0 °C, 1013 mbar.

^b Boilers of class 3 for type E-fuels according to 1.2 do not need to fulfil the requirements for the dust emissions. The actual value shall be stated in the technical documentation and shall not exceed 200 mg/m³ at 10 % O₂.

Requirement	Requirement specification	Test evaluation	Note
Seasonal space heating emission limits For the seasonal space heating emissions see EU 2015/1189. The solid fuel boilers shall comply with the following requirements in Table 8. The requirements shall be met for the preferred fuel and for any other suitable fuel for the solid fuel boiler. Boilers tested only for fuels type non-woody biomass do not have to meet the requirements in Table 8.	ČSN EN 303-5+A1:2023 Art. 4.4.7.2	+	

Table 8

Fuel supply method	Fuel type	Nominal heat output	Seasonal space heating emission limits			
			CO _s	OGC _s	PM _s	NO _x _s
		kW	Seasonal emissions in mg/m ³ at 10 % O ₂ ^a			
Manual supply	Biogenic	≤ 500 kW	700	30	60	200
	Fossil	≤ 500 kW	700	30	60	350
Automatic supply	Biogenic	≤ 500 kW	500	20	40	200
	Fossil	≤ 500 kW	500	20	40	350
NOTE The dust values in this Table are based on the experience of the gravimetric filter method. The method used needs to be referred to in the test report. The particulate matter emission measured according to this European Standard does not include condensable organic compounds which may form additional particulate matter when the flue gas is mixed with ambient air. The values are therefore not directly comparable with values measured by dilution tunnel methods. Neither can they be directly translated into ambient air particulate concentrations.						
^a Referred to dry exit flue gas, 0 °C, 1013 mbar.						

Measurement results: BLAZE GREEN 10 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	8.23	12.34	114	3	65	24/2.4*)	123	4	115	21/2.1*)
Minimum	10.69	9.70	392	10	39	9/1.8*)	523	17	85	9/1.9*)
Seasonal emissions							463	15	90	11/1.9*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Test evaluation:

BLAZE GREEN 10 – Wood meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Table 7.

BLAZE GREEN 10 – Wood meets the requirements for seasonal emission limits as per ČSN EN 303-5+A1:2023, Table 8.

Measurement results: BLAZE GREEN 10 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	8.23	12.34	114	3	65	24/2.4*)	88	3	83	15/1.5*)
Minimum	10.69	9.70	392	10	39	9/1.8*)	380	13	62	7/1.4*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 10 – Wood

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg/m ³]	CO [mg/UM]	NO _x [mg/UM]	OGC/THC [mg/UM]	Dust [mg/UM]
Nominal	8.23	114	65	3	24/2.4*)	60	54	2	10/3.9*)
Minimum	10.69	392	39	10	9/1.8*)	254	41	8	4/3.7*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 18 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	10.08	10.11	23	1	76	17/1.9*)	28	1	156	17 / 1.9 *)
Minimum	11.45	8.82	109	2	55	4/1.6*)	157	4	130	5 / 1.8 *)
Seasonal emissions							138	3	134	6 / 1.8 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Test evaluation:

BLAZE GREEN 18 – Wood meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Table 7.

BLAZE GREEN 18 – Wood meets the requirements for seasonal emission limits as per ČSN EN 303-5+A1:2023, Table 8.

Measurement results: BLAZE GREEN 18 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	10.08	10.11	23	1	76	17/1.9*)	21	1	114	12 / 1.4 *)
Minimum	11.45	8.82	109	2	55	4/1.6*)	114	3	95	3 / 1.3 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 18 – Wood

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg/m ³]	CO [mg/UM]	NO _x [mg/UM]	OGC/THC [mg/UM]	Dust [mg/UM]
Nominal	10.08	23	76	1	17/1.9*)	13	73	1	8 / 0.9 *)
Minimum	11.45	109	55	2	4/1.6*)	73	61	2	2 / 0.9 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 26 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	7.35	12.75	25	1	90	24/2.5*)	25	2	149	20 / 2.0 *)
Minimum	9.76	10.37	122	3	55	3/1.6*)	149	4	111	3 / 1.6 *)
Seasonal emissions							131	4	116	6 / 1.6 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Test evaluation:

BLAZE GREEN 26 – Wood meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Table 7.

BLAZE GREEN 26 – Wood meets the requirements for seasonal emission limits as per ČSN EN 303-5+A1:2023, Table 8.

Measurement results: BLAZE GREEN 26 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	7.35	12.75	25	1	90	24/2.5*)	18	1	108	14 / 1.5 *)
Minimum	9.76	10.37	122	3	55	3/1.6*)	109	4	80	2 / 1.1 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 26 – Wood

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg/m ³]	CO [mg/UM]	NO _x [mg/UM]	OGC/THC [mg/UM]	Dust [mg/UM]
Nominal	7.35	25	90	1	24/2.5*)	12	69	1	9 / 0.9 *)
Minimum	9.76	122	55	3	3/1.6*)	70	52	2	2 / 0.7 *)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 33 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	7.39	13.45	35	4	104	20/2.0*)	35	5	173	16/1.6*)
Minimum	7.20	13.74	418	7	51	8/1.7*)	417	9	84	6/1.4*)
Seasonal emissions							360	8	97	8/1.4*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Test evaluation:

BLAZE GREEN 33 – Wood meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Table 7.

BLAZE GREEN 33 – Wood meets the requirements for seasonal emission limits as per ČSN EN 303-5+A1:2023, Table 8.

Measurement results: BLAZE GREEN 33 – Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg/m ³]	CO [mg/m ³]	OGC/THC [mg/m ³]	NO _x [mg/m ³]	Dust [mg/m ³]
Nominal	7.39	13.45	35	4	104	20/2.0*)	25	4	126	12/1.2*)
Minimum	7.20	13.74	418	7	51	8/1.7*)	303	7	61	5/1.0*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Measurement results: BLAZE GREEN 33 – Wood

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg/m ³]	CO [mg/UM]	NO _x [mg/UM]	OGC/THC [mg/UM]	Dust [mg/UM]
Nominal	7.39	35	104	4	20/2.0*)	17	84	3	8/3.1*)
Minimum	7.20	418	51	7	8/1.7*)	202	41	4	3/2.6*)

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) Dust value during boiler operation with an electrostatic separator

Accredited test
number:

1.1*

Test title:

**Function test of control, regulation and safety elements
Combustion efficiency test – emissions**

Test method:

ČSN EN 303-5+A1:2023
Čl. 5.13, 5.14, 5.16.1, 5.16.2, 5.16.3, 5.17
ČSN EN 303-5+A1:2023
Art. 5.8, 5.9.4

Sample tested:

BLAZE GREEN 10, BLAZE GREEN 33

Measuring equipment used:

Chapter III – Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Function check of the temperature controller and safety temperature limiter of the boiler The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler. A steady state condition shall be reached and the outlet pressure at the flue gas section shall be according to the nominal heat output setting. For manual stoked boilers, the boiler shall be refuelled after reaching steady state with a full batch before starting the test. The dissipated output shall be reduced to $(40 \pm 5) \%$ of the nominal heat output of the boiler; circulating pump running in continuous operation; temperature controller adjusted to maximum set value. When the temperature regulator is running normally, the measured flow temperature shall not exceed 100 °C; the safety temperature cut out or limiter or the device for dissipating excess heat shall not trigger. Repeat the test with the temperature controller out of function. This time, check if the safety temperature limiter/detector switches off the firing system at the highest value specified by the boiler manufacturers and if all hazardous operation states are avoided (see 4.2).	ČSN EN 303-5+A1:2023 Art. 5.13	+	

Requirement	Requirement specification	Test evaluation	Note
Function test of the rapidly disconnectable firing system – Sudden absence of heat dissipation <p>The water-side flow rate shall comply with that specified for the nominal output test. The flow temperature of 75 °C shall not be exceeded at the start of the test.</p> <p>Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler, a steady state condition is reached and the outlet pressure at the flue spigot is according to the rated heat output.</p> <p>The heat consumption is set to 0; water circulation in the boiler is permitted; temperature controller is adjusted to manufacturer recommended maximum set value.</p> <p>Check if the safety temperature limiter or the temperature controller switches off the firing system and all hazardous operation states are avoided.</p> – Loss of the electrical power supply <p>The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test.</p> <p>Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the rated heat output.</p> <p>The electrical supply including the circulation is cut off, check that no hazardous operation conditions occur.</p> <p>For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered.</p>	ČSN EN 303-5+A1:2023 Art. 5.14	0	

Requirement	Requirement specification	Test evaluation	Note
Safety test of consequences of fuel overload and effect of a blockage of the fuel supply The safety of the boiler shall be checked at continuous operation of the boiler with the fuel feed rate of the stoking device set at possible maximum capacity, taking into account failures according to the risk analysis and the electrical safety. If other fuel feed rates lower than the maximum are categorised as critical by the risk analysis, these shall also be tested. The functionality of the safety device for the shut-down of the fuel line shall occur by prevention of the ignition after release of the fuel if no or insufficient combustion in the combustion chamber occurs. The test for blocked fuel line shall be achieved by deactivating the stoking device. The requirements specified in 4.3.5 shall be satisfied.	ČSN EN 303-5+A1:2023 Art. 5.16.2	0	
Loss of combustion air supply The safety of the heating boiler shall be checked at maximum heat input under the following conditions: <ul style="list-style-type: none"> – Failure of the combustion air fan; – Failure to close of the adjustable combustion air supply. In each case, only one failure shall be simulated. The CO concentrations in the boiler shall not exceed 5 % volume. The management of CO concentration shall be carried out in the flue gas measuring section.	ČSN EN 303-5+A1:2023 Art. 5.16.3	+	
Check of safety for condensing operation The boiler is operated at nominal load. The condensate drainage is blocked. The measurement of CO concentration shall be carried out in the flue gas measuring section. Increased condensate formation can be simulated by adding water to the condensate system. It shall be checked and recorded whether the boiler shuts down or reaches the steady-state condition.	ČSN EN 303-5+A1:2023 Art. 5.17	0	

Note:

+	Compliant
-	Non-compliant
0	Not applicable
x	Not evaluated

Test results: BLAZE GREEN 33

Temperature control regulator		
Temperature	[°C]	Note:
Set	95 °C	Limit temperature set on the regulator
Off	96 °C	The flaps were closed and the fan stopped
On	93 °C	The flaps were opened and the fan turned on

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Safety temperature limiter STB		
Temperature	[°C]	Note:
Set	95 °C	Limit temperature set on the temperature limiter
Off	104 °C	The fan has turned off
On	The boiler was irreversibly switched off. In order to restore operation, a manual intervention is required, after the temperature drops down under the limiter switching temperature.	

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Test evaluation:

The safety elements were proved to be functioning properly.

Accredited test
number:

1.1* Test title: **Test of the device for dissipating excess heat**

Test method:

ČSN EN 303-5+A1:2023
Art. 4.1.1, 5.15

Sample tested:

BLAZE GREEN 33

Measuring equipment used:

Chapter III – Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Functioning test of the device for dissipating excess heat (partly or non-disconnectable firing system) Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the nominal heat output. Put the temperature controller out of function. Maintain the function of the of the safety temperature limiter. The heat consumption is set to 0; water circulation in the boiler is permitted. Check if the safety temperature limiter switches off the firing system and the device for dissipating excess heat works properly and all hazardous operation states are avoided. The cold water shall be kept at a temperature of $(10 \pm 5) ^\circ\text{C}$ and a pressure of maximum 2 bar. (Deviations are permissible if they are specified in the installation instructions.) For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered.	ČSN EN 303-5+A1:2023 Art. 5.15	+	
The heat carrier (water) does not become heated to a dangerous extend ($\leq 110 ^\circ\text{C}$).	ČSN EN 303-5+A1:2023 Art 4.1.1	+	

Note:

- + Compliant
- Non-compliant
- 0 Not applicable
- x Not evaluated

Test results: BLAZE GREEN 33

Measured and calculated values:	Unit	Value	Limit	Note
Highest heating water temperature in the boiler	°C	109	110	
Cooling water temperature at the safety valve inlet	°C	9		
Water temperature at the cooling loop outlet	°C	33		
Safety valve opening temperature	°C	108		
Water flow through cooling equipment	m ³ /h	1.554		

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Test evaluation:

During the safety test of the device for removing excess heat, the temperature of the water at the outlet of the boiler did not exceed 110 °C.

Tested by: Ing. Vladimír Foit
Reviewed and approved by: Ing. Stanislav Buchta

Date: 12/2023
Date: 01/2024

Signed: 
Signed: 

V. A list of referenced background materials

- Order of 2023-11-06 (Order Reg. No. B-80816, received on 2023-11-15)
- Contract. B-80816/30
- ČSN EN 303-5+A1:2023 - Heating boilers – Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW – Terminology, requirements, testing and marking
- ČSN EN 15456:2008 - Heating boilers - Electrical power consumption for heat generators - System boundaries – Measurements
- ČSN ISO 80000-1:2023 Quantities and units – Part 1: General

Report compiled by: Ing. Vladimír Foit

Report approved by:



Milan Holomek
Combustion Equipment Manager



– End of text –