



Instytut Badawczy Maszyn, s.p., Brno, Czechy
Institute of Engineering Test, public enterprise, Czech Republic

OSVĚDČENÍ Z KOUŠCE CERTYFIKAT Z TESTU

ISIO
Numer

O-B-00840-24

Producent — *Manufacturer*

BLAZE HARMONY s.r.o.
Tmávka 37
751 31 Lipník nad Bečvou VII Czechy —
Czech Republic

Produkt — *Product*

Kotel vodný — *Hot-water boiler*

Oznaczenie typu — *Type designation*

BLAZE PRAKTIK 17, BLAZE PRAKTIK 25,
BLAZE PRAKTIK 40

Wymagania dotyczące ekoprojektu — *Ecodesign requirements*

Nařízení Komise (EU) č. 2015/1189, příloha II, čl. 1 *Rozporządzenie Komisji (UE) nr 2015/1189, załącznik II, art. 1* Nařízení Komise (EU) č. 2015/1187

Rozporządzenie Komisji (UE) nr 2015/1187

Metoda badań — *Test method*

ČSN EN 303-5+A1:2023

Metoda ogrzewania — *Heating method*

Ręczne — *Manual*

Preferowane paliwo — *Preferred fuel*

Drewno — *Wood*

Wyniki — *Wyniki*

Typ — type

BLAZE PRAKTIK 17

BLAZE PRAKTIK 25

BLAZE PRAKTIK 40

Moc znamionowa — *Nominal output*

CO (10% O ₂)	mg/mm	323	205	63
OGC (10% O ₂)	mg/Mn*	5	2	2
Pył — <i>Dust</i> (10% O ₂)	mg/ITIn ³	52	50	25
NO _x (10% O ₂)	mg/ITIn*	190	177	158
Wydajność — <i>Efficiency</i>	%	88,4	88,6	93,3
Efektywność użytkowa — <i>Useful efficiency</i>	%	80,8	79,9	84,2

Zmniejszona wydajność — *Minimum output*

CO (10% O ₂)	mg/Mn*	523	663	167
OGC (10% O ₂)	mg/m ³	17	25	16
Pył — <i>Dust</i> (10% O ₂)	mg/ITIn ³	9	7	8
NO _x (10% O ₂)	mg/Mn ³	85	135	137
Wydajność — <i>Efficiency</i>	%	92,6	91,5	94,5
Efektywność użytkowa — <i>Useful efficiency</i>	%	84,7	82,5	85,2





Typ — typ		BLAZE PRAKTIK 17	BLAZE PRAKTIK 25	BLAZE PRAKTIK 40
Emisje sezonowe — Seasonal emissions				
CO (10% Oz)	mg/m ³	493	594	151
OGC (10% Oz)	mg/m ³	15	22	14
Pył — Oc/sf (10% O ₂) NO _x	mg/m ³	15	13	11
(10% Oz)	mg/m ³	101	141	140
rtson	%	84,1	82,1	85,1
F1	%	3,0	3	3,0
F2	%	1,4	0,8	0,3
Sezonowa efektywność energetyczna — Seasonal space heating energy efficiency				
fts	%	80	78	B2
Wskaźnik efektywności energetycznej — Energy Efficiency Index				
EEI		118	115	120
Klasa efektywności energetycznej — Energy Efficiency Class				
		A+	A+	A+

Raport nr - Report No.

30-17165/1/T, 30-14720/1/T

Podstawa do wydania certyfikatu
Podstawa wydania certyfikatu

i protokoły uzupełniające — and follow-up reports,
wydane przez laboratorium badawcze nr 1045.1, akredytowane przez ČIA
o.p.s., numer certyfikatu akredytacji 106/2024 i jednostkę notyfikowaną 1015
wydane przez laboratorium badawcze nr 1045.1, akredytowane przez ČAI,
Certyfikat akredytacji nr 106/2024 i jednostka notyfikowana 1015

Instytut Badań Technicznych, s.p. niniejszym certyfikatem potwierdzamy, że dla przedmiotowego produktu przeprowadziliśmy
próby i obliczenia z powyższymi wynikami, które są zgodne z wymaganiami powyższych przepisów.
Instytut Badań Inżynierskich niniejszym certyfikatem potwierdzamy, że dla danego produktu przeprowadziliśmy
i obliczenia, których wyniki są zgodne z wymaganiami powyższych przepisów.

Brno, 2024-05-20

Ing. Stanislav Buchta
Zastępca kierownika działu urządzeń spalających
Combustion Equipment Deputy Manager



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-00840-24**

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 PRAKTIK 17, BLAZE PRAKTIK 25,
BLAZE PRAKTIK 40**

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 PRAKTIK 17 BLAZE PRAKTIK 25 BLAZE PRAKTIK 40

Jmenovitý výkon – *Nominal output*

CO (10% O ₂)	mg/m ³	323	205	63
OGC (10% O ₂)	mg/m ³	5	2	2
Prach – <i>Dust</i> (10% O ₂)	mg/m ³	52	50	25
NO _x (10% O ₂)	mg/m ³	190	177	158
Účinnost – <i>Efficiency</i>	%	88.4	88.6	93.3
Užitečná účinnost – <i>Useful efficiency</i>	%	80.8	79.9	84.2

Snížený výkon – *Minimum output*

CO (10% O ₂)	mg/m ³	523	663	167
OGC (10% O ₂)	mg/m ³	17	25	16
Prach – <i>Dust</i> (10% O ₂)	mg/m ³	9	7	8
NO _x (10% O ₂)	mg/m ³	85	135	137
Účinnost – <i>Efficiency</i>	%	92.6	91.5	94.5
Užitečná účinnost – <i>Useful efficiency</i>	%	84.7	82.5	85.2



O-B-00840-24, strana – *page* 1 (2)

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





Typ – type

BLAZE PRAKTIK 17

BLAZE PRAKTIK 25

BLAZE PRAKTIK 40

Sezonní emise – Seasonal emissions

CO (10% O ₂)	mg/m _n ³	493	594	151
OGC (10% O ₂)	mg/m _n ³	15	22	14
Prach – Dust (10% O ₂)	mg/m _n ³	15	13	11
NO _x (10% O ₂)	mg/m _n ³	101	141	140

η _{son}	%	84.1	82.1	85.1
F1	%	3.0	3.0	3.0
F2	%	1.4	0.8	0.3

Sezonní energetická účinnost – Seasonal space heating energy efficiency

η _s	%	80	78	82
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Index energetické účinnosti – Energy Efficiency Index

EEI		118	115	120
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Třída energetické účinnosti – Energy Efficiency Class

A+	A+	A+
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Podklad pro vydání osvědčení
Basis for Certificate issue

Protokol č. - Report No.
30-17165/1/T, 30-14720/1/T
a protokoly navazující – and follow-up reports,
vydané Zkušební laboratoří č. 1045.1, akreditovanou ČIA o.p.s.,
číslo osvědčení o akreditaci 106/2024 a Notifikovaná Osoba 1015
issued by Testing Laboratory No. 1045.1, accredited by CAI,
Accreditation Certificate No. 106/2024 and Notified Body 1015

Strojírenský zkušební ústav, s.p. tímto osvědčením o zkoušce potvrzuje, že u předmětného výrobku provedl zkoušky a výpočty s výše uvedenými výsledky, které jsou ve shodě s požadavky výše uvedených předpisů.
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, which comply with the requirements of the above regulations.

Brno, 2024-05-20



Ing. Stanislav Buchta
Zástupce manažera sekce spalovacích zařízení
Combustion Equipment Deputy Manager



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 **30-17165/1/T**

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

Type designation: BLAZE PRAKTIK 17

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

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

Report issue date: 2024-05-15

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

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SP-2021-000011_1_11

I. Description of product tested

The boiler BLAZE PRAKTIK 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 25 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 boiler is insulated with a 30 mm mineral fibre layer. The boiler external casing is made of 1 mm steel sheet. The lower door of the boiler contains a peephole with ceramic glass.

The regulator control panel is placed on the upper door. The regulating unit as such is placed on the rear wall of the boiler in an electrical switchboard. This concerns models ecoMAX 800D3-E and ecoMAX 860D3 depending on the boiler output. The boiler can be fitted with a lambda probe to control the combustion process.

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, interconnected by a flat steel axis. 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 and a pressure mechanism consisting of a shaft with a pressure arm, which is connected to the loading door by a tie rod.

The rear combustion exchanger contains turbulators. As an optional accessory, there are mechanical turbulators controlled by a lever, which are intended to clean the exchanger.

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 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.

All detailed descriptions of individual boiler component part assemblies are included in the enclosed technical documentation to Tasks 30-16047, 30-16981 and 30-17165.

II. Sample tested

The following samples have been submitted for a visual inspection, tests and evaluations:

Table 1

Boiler output version	Nominal output [kW]	Minimum output [kW]	Fuel	Place of tests
BLAZE PRAKTIK 17	17.0	5.0	Wood (ČSN EN ISO 17225-5:2022)	BLAZE HARMONY s.r.o. Trnávka 37 751 31 Lipník nad Bečvou VII, SZÚ Brno

Sample(s) evaluated:

- Number of samples: 1
- Submission date: 2024-04-16
- Registration number: —
- Serial number: prototyp1

The visual inspection, tests and evaluations were performed by Ing. Filip Molčan in April 2024 at BLAZE HARMONY s.r.o., Trnávka 37, 751 31 Lipník nad Bečvou VII.

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

III. Measuring and test equipment

Table 2

No.	Description	Inventory number
1.	Analyser of emissions Horiba, type ENDA-680P	022394
2.	Platform scale	022331
3.	Induction flow meter	MaR10_Pr1
4.	A kit for temperature measurement	022399-D/8
5.	Thermometer, hygrometer	MaR10+11_V
6.	Station barometer	111985
7.	Digital pressure gauge – draught gauge	MaR10_Tah
8.	Electronic stopwatch	990806
9.	Gravimat SHC 501	022328
10.	Analytical scale Sartorius	021682
11.	Electronic thermometer THERM 3280-8M	022153
12.	Electric meter	022389-A/4
13.	Induction water meter	022389-C/1
14.	Electromechanical scale	022151
15.	Electromechanical scale	022211
16.	Tape measure	ME 606
17.	Equipment for testing flue gas connector tightness	022388

Note:

× ... Verified with the use of calibration standards prior to measurement

+ ... ± 5 % of measured values

Table 3

Note:
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.

If a statement of compliance is provided, the decision rule pursuant to ILAC-G8:09/2019, Art. 4.2.1 - binary statement for the simple acceptance rule shall apply.

Test results:

Note:	+	Compliant
	-	Non-compliant
	0	Not applicable

Date of test

2024-04-16

Ambient conditions

24.0 °C

28.6 %

97.5 kPa

Temperature

Relative humidity

Barometric pressure

Test evaluation:

There were no leaks or visible permanent deformation during the test.

Test subject:	Test of leakage of the combustion chamber
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
Test method:	ČSN EN 303-5+A1:2023 Art. 4.3.8, 5.16.6
Sample tested:	BLAZE PRAKTIK 17
Measuring equipment used:	see Chapter III

Test results:

Requirement	Requirement specification	Test evaluation	Note
Leakage of the boilers category I 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 a 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. The gas side resistance shall be determined for manual stoked boilers with the fuel chamber filled to maximum capacity (as specified by the manufacturer). These requirements are fulfilled for positive pressure boilers category 3. <i>NOTE For boilers designed to operate with negative pressure, the leakage rate measured according to 5.6 characterizes the boiler.</i>	ČSN EN 303-5+A1:2023 Art. 4.3.8	+	
Test for gas side leakage This test is for boilers with a positive pressure in the combustion chamber (category 1) and boilers category 2 and 3. 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. 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 the leakage test setup. 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. The test shall be performed after safety and performance test (5.7 to 5.18). <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>	ČSN EN 303-5+A1:2023 Art. 5.16.6	0 +	Category 1, operating with negative pressure

Note:

+	Compliant
-	Non-compliant
0	Not applicable

Test subject:	Surface temperature test
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
Test method:	ČSN EN 303-5+A1:2023 Art. 5.11, 5.16.4, 4.3.7
Sample tested:	BLAZE PRAKTIK 17
Measuring equipment used:	see Chapter III

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: – 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	+	

Note:

+	Compliant
–	Non-compliant
0	Not applicable

Measurement results:

Average temperatures of boiler walls, doors and covers (°C):		
Boiler	BLAZE PRAKTIK 17	
Fuel type	Wood	
Output	Nominal	Reduced
Date of test	2024-04-16	2023-12-13
Ambient temperature [°C]	24.0	24.5
Relative humidity [%]	28.6	28.8
Barometric pressure [kPa]	97.5	97.13
Front wall	35.9	31.7
Rear wall	42.8	33.8
Right wall	34.0	29.2
Left wall	33.1	30.3
Upper wall	35.4	32.0
Lower wall	39.0	41.0
Temperatures of control elements (°C):		
Upper door handle – metal	32.0	
Lower door handle – plastic	34.0	
Control unit – plastic	30.0	
Main switch – plastic	33.0	
Air control – metal	34.0	
STB – plastic	48.0	

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.

Test subject:	Test of heat output, input and efficiency Test of combustion products temperature
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
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 PRAKTIK 17
Measuring equipment used:	see Chapter III

Test results:

Average measured and calculated values (solid fuels):

Test No.:	I.	II.	Average	III.
Boiler type:	BLAZE PRAKTIK 17			
Output tested:	Nominal			Reduced
Date of test:	2024-04-16			2023-12-13
Type of fuel:	Wood – A			
Combustion period (manual fuel supply)	2 x 2 hours			2 hours
Nominal heat output (specified by the manufacturer) [kW]	17.0	17.0	17.0	17.0
Flue gas temperature [°C]	155.1	161.4	158.2	62.3
Fuel consumption [kg/hour]	4.080	3.951	4.0	1.241
Inlet water temperature [°C]	54.7	59.7	57.2	61.5
Outlet water temperature [°C]	74.5	78.8	76.6	71.7
Cooling water temperature [°C]	–	–	–	–
Cooling water volume flow [m ³ /hour]	0.700	0.700	0.700	0.429
Draught behind boiler [Pa]	6.0	6.5	6.3	4.6
Ambient temperature [°C]	23.0	25.1	24.0	24.5
Relative air humidity [%]	28.9	28.3	28.6	28.8
Barometric pressure [kPa]	97.57	97.46	97.5	97.13

Analysis of combustion products:

Test (combustion period) no.:	I.	II.	Average	III.
Oxygen O ₂ [%]	8.74	8.96	8.85	10.69
Carbon dioxide CO ₂ [%]	11.88	11.59	11.74	9.70
Carbon monoxide CO [ppm]	188	383	286	392
Higher hydrocarbons THC/OGC [ppm]	2	4	3	10
Nitrogen oxides NO _x [ppm]	102	102	102	39
Sulphur oxides SO ₂ [ppm]	<1	<1	<1	<1

Auxiliary combustion values (solid fuels):

Test (combustion period) no.:	I.	II.	Average	III.
Stoichiometric oxygen volume [m ³ /kg]	0.840	0.840	0.840	0.838
Stoichiometric air volume [m ³ /kg]	4.000	4.000	4.000	3.990
Stoichiometric volume of dry combustion products [m ³ /kg]	3.966	3.966	3.966	3.972
Maximum content of CO ₂ [%]	20.28	20.28	20.275	20.62
Stoichiometric air multiple [-]	1.71	1.73	1.720	2.03
Volume of dry combustion products – actual [m ³ /kg]	6.759	6.916	6.837	8.411
Content of H ₂ O in combustion air [m ³ /kg]	0.057	0.065	0.061	0.074
Content of H ₂ O in combustion products [m ³ /kg]	0.807	0.815	0.811	0.784
Wet combustion products mass flow rate [kg/s]	0.011	0.011	0.011	0.004

Calculated values – thermal overview:

Test (combustion period) no.:	I.	II.	Average	III.
Loss through sensible heat of combustion products (chimney) [%]	8.7	9.2	8.9	3.0
Loss through gas underburning [%]	0.1	0.2	0.2	0.3
Loss through mechanical underburning [%]	0.03	0.03	0.03	0.1
Loss through heat transfer into environment [%]	2.2	2.2	2.2	3.8
Loss through flue gas condensation [%]	–	–	–	–
Total loss [%]	11.0	11.6	11.3	7.2
Efficiency – indirect method [%]	89.0	88.4	88.7	92.8
Fuel mass flow - actual [kg/hour]	4.083	3.954	4.0	1.245
Heat input [kW]	17.9	17.3	17.6	5.4
Heat output [kW]	15.9	15.3	15.6	5.0
Uncertainty of determining heat output [kW]	0.7	0.6	0.7	0.1
Output / Nominal output [%]	93.4	89.8	92.0	29.4
Efficiency – direct method [%]	88.7	88.1	88.4	92.6
Useful efficiency [%]	–	–	80.8	84.7
Seasonal efficiency [%]	–	–	84.1	–
Seasonal energy efficiency [%]	–	–	80	–
Energy efficiency index [-]	–	–	118	–
Energy efficiency class [-]	–	–	A+	–

Efficiency of boiler BLAZE PRAKTIK 17 when burning **Wood** meets the requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE PRAKTIK 17 – 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 less than 160 K above the ambient temperature;
Combustion period is 2 x 2 hours when burning wood;
The minimum heat output is lower than 30% of nominal heat output.

Fuel analysis:

Type of fuel	Wood – Nominal output			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Combustion heat	Q_s	[UM/kg]	17.25	0.22
Calorific value	Q_j	[UM/kg]	15.78	0.22
Total water, in original condition	W_t	[% of mass]	12.12	0.01
Ash	A	[% of mass]	0.07	0.01
Carbon	C	[% of mass]	43.48	0.24
Hydrogen	H	[% of mass]	5.4	0.20
Nitrogen	N	[% of mass]	0.19	0.14
Sulphur	S	[% of mass]	0.022	0.005
Chlorine	Cl	[% of mass]	0.016	0.003
Oxygen, calculation for 100%	O	[% of mass]	38.71	

Note: Sample in original condition

Type of fuel	Wood – Reduced output			
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_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."

Test subject:	Electrical consumption
Exact name of the test procedure:	1.73* - Electrical energy consumption tests
Test method:	ČSN EN 303-5+A1:2023 Art. 5.7.7 ČSN EN 15456:2008 Art. 5
Sample tested:	BLAZE PRAKTIK 17
Measuring equipment used:	see Chapter III

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	+	

Note: + Compliant
 - Non-compliant
 0 Not applicable

Measurement results:

Maximum electric input	100 W
Electric input at nominal output	70 W
Electric input at minimum output	26 W
Electric input for STAND BY mode	3 W

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

Test subject:	Combustion efficiency test – emissions
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
Test method:	ČSN EN 303-5+A1:2023 Art. 5.6.3, 5.6.4, 5.8, 5.9.4
Sample tested:	BLAZE PRAKTIK 17
Measuring equipment used:	see Chapter III

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		
			mg/m³ at 10 % O₂ ^a								
		kW	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.						

Note:

+	Compliant
–	Non-compliant
0	Not applicable

Measurement results: BLAZE PRAKTIK 17 – 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 I. period	8.74	11.88	188	2	102	59	211	3	188	53
Nominal II. period	8.96	11.59	383	4	102	56	437	6	192	51
Average	8.85	11.74	286	3	102	58	323	5	190	52
Reduced	10.69	9.70	392	10	39	9	523	17	85	9
Seasonal emissions							493	15	101	15

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

Test evaluation:

BLAZE PRAKTIK 17 – Wood meets emission requirements for **Class 5** as per ČSN EN 303-5+A1:2023, Table 7.

BLAZE PRAKTIK 17 – Wood meets the requirements for seasonal emission limits as per ČSN EN 303-5+A1:2023

Boiler output	Average values			
	Measured values		Calculated values (based on N content in reference fuel)	
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg/m ³]	NO _x (O ₂ =13%) [mg/m ³]
Average	102	64	120	87
Reduced	39	44	97	71

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

Measurement results: BLAZE PRAKTIK 17 – 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 I. period	8.74	11.88	188	2	102	59	154	2	137	39
Nominal II. period	8.96	11.59	383	4	102	56	318	4	139	37
Average	8.85	11.74	286	3	102	58	235	3	138	38
Reduced	10.69	9.70	392	10	39	9	380	13	62	7

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

Measurement results: BLAZE PRAKTIK 17 – 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 I. period	8.74	188	102	2	59	101	90	2	25
Nominal II. period	8.96	383	102	4	56	210	92	3	24
Average	8.85	286	102	3	58	155	90	2	25
Reduced	10.69	392	39	10	9	254	41	8	4

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

Test subject:	Function test of control, regulation and safety elements Combustion efficiency test – emissions
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
Test method:	ČSN EN 303-5+A1:2023 Art. 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 PRAKTIK 17
Measuring equipment used:	see Chapter III

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 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. 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. The heat consumption is set to 0; water circulation in the boiler is permitted; temperature controller is adjusted to manufacturer recommended maximum set value. Check if the safety temperature limiter or the temperature controller switches off the firing system and all hazardous operation states are avoided. – Loss of the electrical power supply 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 is reached and the outlet pressure at the flue gas section is according to the rated heat output. The electrical supply including the circulation is cut off, check that no hazardous operation conditions occur. 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. 5.14	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: – 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

Test results: BLAZE PRAKTIK 17 – Wood

Temperature control regulator		
Temperature	[°C]	Note:
Set	85 °C	Temperature set on the operating thermostat regulator
Off	84 °C	Start of regulation
On	80 °C	Full run

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	Temperature set on the temperature limiter
Off	97 °C	The fan 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.

Test subject:	Test of the device for dissipating excess heat
Exact name of the test procedure:	1.1* - Tests of tightness, pressure resistance, thermal parameters, combustion efficiency, safety functions
Test method:	ČSN EN 303-5+A1:2023 Art. 4.1.1, 5.15
Sample tested:	BLAZE PRAKTIK 17
Measuring equipment used:	see Chapter III

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

Test results: BLAZE PRAKTIK 17 – Wood

Measured and calculated values:	Unit	Value	Limit	Note
Highest heating water temperature in the boiler	°C	104.4	110	
Cooling water temperature at the safety valve inlet	°C	18.0		
Water temperature at the cooling loop outlet	°C	32		
Safety valve opening temperature	°C	101.5		
Cooling water input pressure	bar	2		
Water flow through cooling equipment	m ³ /h	1.2		

Note: Date of testing and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)
Boiler cooling test during overheating using Regulus valve type: DBV 1

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. Filip Molčan
Reviewed and approved by: Ing. Stanislav Buchta

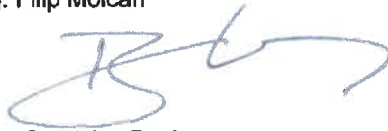
Date: 2024-05-15
Date: 2024-05-15

Signed: 
Signed: 

V. A list of referenced background materials

- Order of 2024-04-09 (Order Reg. No. B-81995, received on 2024-04-10)
- Contract B-81995/30
- 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 on Initial Product Type Testing 30-16981/1/T of 2024-01-11

Report compiled by: Ing. Filip Molčan



Report approved by: Ing. Stanislav Buchta
Combustion Equipment Deputy Manager



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