"TERMOPLAM" - Ltd. SOFIA
Permission for assessing the performance of construction products № CPR 22 - NB 2608 since 04.10.2015, from MRDPW

c. Sofia residential district of "Razsadnik-Konyovitsa", bl.№ 82, ent.B, 3rd floor, apt. 53
GSM 0888 862 192, http://www.termoplam.eu, e-mail: termoplam2011@abv.bg



HEAD OF LABORATORY:.....
(eng. Plamen. Iliev)

PROTOCOL

from
(type testing of the product)
№ 236/27.06.2024

I. OBJECT OF TEST:

Residential space heating appliance fired by wood pellets :
OPTIMA 10, 2024
(Name, type, model, serial number and year of manufacture of the product)

II. MANUFACTURER:

Blist d.o.o., Kralja Aleksandra Obrenovića 13, 14104 Beloševac, Valjevo, Srbija
(Name and address)

III. APPLICANT FOR THE TEST:

Blist d.o.o. Kralja Aleksandra Obrenovića 13, 14104 Beloševac, Valjevo, Srbija
Request № 236/21.06.2024
(Name, address, № and date of the request-query)

IV. NORMATIVE AND TECHNICAL BASIS FOR EXECUTION OF TEST:

EN 14785:2006 - Residential space heating appliances fired by wood pellets - Requirements and test methods;
(№ and name of the legal document)

V. TEST RESULTS:

The test results are given in Table 1 and Table 2.

Table 1

1	2	3	4	5	6
№	**Essential Characteristics**	**Unit**	**Test results**	**Value and tolerance of the indicator; Point from the standard**	**Test Cond.**
	Fire safety				
p.4.2	**General construction**		Yes		
	Containing asbestos and cadmium		No		
	Reliable and safe work		Yes		
p.4.3	**Flue spigot or socket**		≥25 Yes	≥25Φ≤160mm	
p.4.7	**Firedoors** (Safe and tightly closed)		Yes		
p.4.8	**Combustion air supply** (Clear, durable marking)		Not applicable		
p.4.10	**Retort (Burner)** (Unique mounting)		Yes		
p.4.11	**Ashpan and ash removal** (For internal-to collect the ashes of 2 bunkers) Sufficient volume of air, Handling while hot)		Yes		
p.5.1	**Temperatures of adjacent combustible materials**	°C	59.349 -Yes Back Panel 50.360 -Yes Floor Panel	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.5.3	**Safety test** (Escaping gas and fire)		No		
p.5.4	**Temperature in the fuel hopper**	°C	43.280 Yes 40.029 Yes	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.5.5	**Safety of fuel container** (Safety against back burning through the fuel conveyor system)	°C	43.280 Yes 40.029 Yes	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.5.8	**Strength of boiler shells** (Density and resistance to deformation)		Not applicable		
	Emissions from combustion products				
p.4.2	**General construction - emissions** (Escaping gas and zest)		Yes		
p.4.3	**Flue spigot or socket** (Density and reliability)		Yes		
p.4.7	**Firedoors** (Density and reliability)		Yes		
p.4.8	**Combustion air supply** (Thermostat in a water jacket-automatic)		Not applicable		
p.4.9	**Internal flue gas diverter** (Unique, easy installation and indication)	mm	Yes		
p.4.14	**Cleaning of heating surfaces** (Ease and accessibility devices)		Yes		
p.5.3	**Safety Testing** (Escaping gas and zest)		No		
p.5.4	**Temperature in the fuel hopper**	°C	43.280 Yes 40.029 Yes	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.6.3	**Carbon monoxide emissions** (CO emissions limits)	%	0.0191 0.0140	≤ 0,04% ≤ 0,06%	Nominal Minimum
	Release of harmful substances		No	ZA.1	

1	2	3	4	5	6
	Surface temperature				
p.4.2	**General construction** (Safe work)		Yes		
p.4.13	**Control of flue gas** (Value, clear marking)	cm^2 %	Not applicable ≥ 3%	≥ 20 cm^2 or ≥ 3%	
p.5.1	**Temperatures of adjacent combustible materials**	°C	59.349 -Yes Back Panel 50.360 -Yes Floor Panel	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.5.2	**Operating tools**	°C	45.650 Yes/ 43.471 Yes	For metal Tr+35K=30.4+35=65.4°C -nominal output Tr+35K=28.6+35=63.6°C -minimum output	Trnom = 30.4 °C Trmin = 28.6 °C
p.5.4	**Temperature in the fuel hopper**	°C	43.280 Yes 40.029 Yes	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4°C Trmin = 28.6 °C
p.5.5	**Safety of fuel container**	°C	43.280 Yes 40.029 Yes	Tr+65°C=30.4+65=95.4 °C -nominal output Tr+65°C=28.6+65=93.6 °C -minimum output	Trnom = 30.4 °C 28.6°C
p.5.9	**Electrical safety**		Yes	EN 60335-2-102:2016	
	Cleanability				
p.4.5	**Flue ways** (Accessibility and cleaning)	mm	≥ 40 mm Yes		
p.4.6	**Cleaning tools** (Instrument-presence)		No		
p.4.10	**Retort (Burner)** (Unique mounting)		Yes		
p.4.12	**Integral boiler** (Requirements to parts of the water system)	mm - mm mm	Not applicable -	 Certificate Opening≥70x40mm Opening Φ≥70mm	Thickness Number Contour Diameter
	Max. working pressure (Only for devices with water jacket)				
p.4.2	**General construction**	bar	-	$p_{test}=2 \times p_{nom}$ for t≥10 min A.4.9.2	p_{nom} = - bar
p.5.6	**Safety from overheating** (Safety device)	°C	Not applicable	≤105 °C	
p.5.7	**Safety in closed sys.** (Safety device)	- °C	Not applicable	≤105 °C	
p.6.2	**Temperature of flue gases-ta**	°C	139.9/114.8		
	Mechanical strength				
p.4.2	**General construction** (Safe and secure work)		Yes		
p.4.3	**Flue spigot or socket**		≥25mm - Yes	Overlap ≥25mm Φ≤160 mm Overlap ≥40mm Φ>160 mm	
	Heat transfer (Energy efficiency)				
p.6.1	**Flue draught** (in chimney)	Pa	 Yes Yes	for P ≤ 25 kW 12±2 Pa 10±2 Pa	P≤25kW Nominal Minimum
p.6.4	**Efficient energy utilization**	%	η 89.6 91.5	 η ≥ 75 % η ≥ 70 %	- Nominal Minimum load

VI. TEST OBJECTIVES:

6.1 Nominal heat flow (nominal power);
6.2 Test duration at low heat output;
6.3 Testing of safety;

VII. USED EQUIPMENT:

7.1 Air speed meter TESTO 405-V1.
7.2 Digital thermometer MS8127 with perceiver - DS18B20 to ambient temperature and walls of the test area;
7.3 Vacuum-gauge- Testo 512;
7.4 Electronic stopwatch Casio FA109;
7.5 Thermohygrometer HAMA;
7.6 Gas analyzer – TESTO 350 XL;
7.7 Scales up to 510 kg - to measure the weight of the testing device;
7.8 Scales from 5 g to 40 kg - measuring the weight of the fuel;
7.9 Tape measure;
7.10 Caliper;
7.11 Auxiliary devices: PC package applications;

VIII. REQUIREMENTS:

8.1 Safety measures are met in accordance with paragraph 5 and p.6.10; Yes
8.2 The test device complies to the installation and exploitation manual in accordance with paragraph 7; Yes
8.3 Presence of plate according p.8: Yes
8.4 Requirements regarding the type of fuel - see. Annex B, dimensions and arrangement , and that the camera meets the manufacturer's instructions; Yes
8.5 Requirements for the materials:
-Real values of measuring thicknesses and others along with additional certificates for the plumbing parts. Not applicable
-Presence of leaks and noticeable deformations (elastic and plastic) according A.4.9.2; Not applicable

p_{test} = 2 * p_{nom} = - bar
p_{nom} = - bar

Certificate Number: № 112521/09.11.2019, HBIS GROUP Serbia Iron & Steel IIc Belgrade.

8.6 Testing of the thermal protection of outputs (Safety of closed water jacket) Not applicable
Safety Device installed according to p.5.7; Not applicable
Safety Device - activates at ≤ 105 ˚C accordance with the requirements of p 5.7; 420 mm
8.7 Distance from the unit to the part with the highest measured temperature of trihedrone
- Back Panel accordance with p. 5.1;
Type of fuel:
- Wood pellets with humidity W=5,21 ± 0,16% with a test report № 2155/29.10.2020 г. issued by, the EUROTEST - Control SA
8.8 Mass of test fuel burnt per 1h (according to A.4.2); nom.B= 2.32 kg/h
min.B= 0.66 kg/h
8.9 Mass flow rate of the exhaust gases (according to p.A.6.2.5); nom.M= 9.1 g/s
min.M= 2.8 g/s

Table 2

1	2	3	4	5	6	7
№	**Essential Characteristics**	**Unit of value**	**№ of specimen**	**Test results nom/min**	**Value and tolerance of indicator Standard & Norm. doc**	**Test conditions nom/min**
1	Ambient temperature- Tr	°C		30.4/28.6		30.4 °C/
2	Temperature of flue gases-ta	°C		139.9/114.8		28.6 °C
3	CO	%		0.0191/ 0.0140	≤0.0400 nom. ≤0.0600 min.	≤ 0.01 m/s ≤ 0.01 m/s
4	CO_2	%		8.59/8.24		
5	M_w	kg/h				
6	t ent.water	°C				
7	t exit water	°C				
8	η	%		89.6/ 91.5	≥75 % nom. ≥70 % min.	
9	O_2	%		12.10/12.46		
10	Mass of fireplace (dry/wet)	kg		74		
11	Spatial thermal power	kW		10.0/2.9		
12	Water heat output	kW				
13	Total thermal power	kW		10.0/2.9		
14	Volume of pellet fuel tank	kg		17		

Note: The results before the slash refer to a test at nominal power and then to a partial load test (reduced power).

CONDUCTING THE TEST:.....
(eng. Georgi Iliev)

CAUTION:
The test results apply only to test samples.
Recreating this test report is only permitted in a holistic manner.
Extracts from the test report may not be reproduced without written consent, but "TERMOPLAM" - LTD.