

TEST REPORT n. 1880-CPR-010-20

Initial Test Typing

Residential space heating appliances fired by wood pellets
EN 14785:2006

Manufacturer: THERMOROSSI S.P.A.
VIA GRUMOLO, 4
36011 ARSIERO (VI)
ITALY

Type designation: BELLAVISTA R PLUS (tested appliance)
BELLAVISTA S PLUS
BELLAVISTA R2PLUS
BELLAVISTA S2 PLUS

Type of appliance: Residential space heating appliances fired by wood pellets without
water heat exchanger.

Receipt date: January 30, 2020

Start test date: January 30, 2020

End test date: February 04, 2020

Testing laboratory: ACTECO SRL
via Amman, 41
33084 Cordenons (PN)
Italy

Issue date: June 22, 2020

Head of Test Laboratory
Dr.ssa Claudia Marcuzzi

The results of the tests relate only to the tested appliance.
This test report shall not be reproduced except in full, without written approval of the laboratory.
The appliance was returned to the manufacturer after the end of tests.

All data is stored for 10 years

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Task

ACTECO SRL was instructed to execute initial type testing to establish compliance according to the:

- UNI EN 14785:2006 Residential space heating appliances fired by wood pellets.
- UNI CEN/TS 15883:2009 Residential solid fuel burning appliances. Emission test methods
- Client's documents

The practical tests were performed in the laboratory in Cordenons (PN), via Amman, 41.

Sampling of the appliance

The sampling of the appliance was performed by the manufacturer and was received by the testing laboratory on January 30, 2020.

Description of the appliance

Residential space heating appliances fired by wood pellets.

The combustion air is taken from the test room.

Key data of appliance

Appliance	BELLAVISTA R PLUS	
Fuel		Wood pellet
Fuel throughput	kg/h	2,5
Total heating output	kW	11,1
CO emission based on 13% O ₂	mg/m ³	39
Efficiency	%	90,7
Flue gas temperature	°C	166
Necessary flue draught	Pa	10,3
Flue gas mass flow	g/s	7,0
Minimum clearance distances from exposed / combustibile materials	from rear wall from side walls	--- mm --- mm

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PERFORMANCE AT THE NOMINAL HEAT OUTPUT TEST

test n°			1	2	average
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Combustion:					
fuel load		kg	7,3	7,6	7,5
test period		min	180	180	180
fuel load	<i>B</i>	kg/h	2,4	2,5	2,5
average flue draught		Pa	10,0	10,6	10,3

Ventilation circuit:					
average ambient room temperature	<i>tr</i>	°C	29,4	28,1	28,8

Flue gas:					
carbon dioxide	<i>CO₂</i>	%	11,4	11,0	11,2
oxygen	<i>O₂</i>	%	10,6	10,3	10,4
carbon monoxide	<i>CO</i>	%	0,004	0,004	0,004
average flue gas temperature	<i>ta</i>	°C	167	166	166
maximum flue gas temperature		°C	169	172	171
flue gas mass flow	<i>m</i>	g/s	6,9	7,4	7,2

Maximum surface temperatures:					
internal fuel hopper		°C	50,3	55,8	53,1

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test n°			1	2	average
Results:					
thermal losses in flue gas	q_a	%	8,9	9,2	9,1
thermal losses in flue gas	Q_a	kJ/kg	1584	1640	1612
chemical losses in flue gas	q_b	%	0,02	0,02	0,02
chemical losses in flue gas	Q_b	kJ/kg	3,9	4,3	4,1
heat losses due to combustible through the grate	q_r	%	0,2	0,2	0,2
efficiency	η	%	90,9	90,5	90,7
carbon monoxide [at 13% O ₂]		%	0,003	0,003	0,003
carbon monoxide		mg/MJ	26	26	26
carbon monoxide [at 13% O ₂]		mg/m^3	39	39	39
total heat output	P	kW	10,9	11,3	11,1

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STATEMENTS OF THE TEST RESULTS

The following requirements of EN 14785:2006 are met:

- materials, design and construction requirements specified in clause 4 (as declared by the manufacturer);
- the performance requirements specified in clause 6;
- the installation and operating instructions requirements specified in clause 7;
- the marking information requirements specified in clause 8.

PERFORMANCE AT THE NOMINAL HEAT OUTPUT TEST			
Parameter		result	EN 14785:2006 limit
carbon monoxide [at 13% O ₂]	%	0,003	< 0,04
efficiency	%	90,7	> 75

The appliances

BELLAVISTA R PLUS (tested appliance)
BELLAVISTA S PLUS
BELLAVISTA R2PLUS
BELLAVISTA S2 PLUS

of THERMOROSI S.P.A comply with the requirements of the harmonized European standard UNI EN 14785:2006.

Compliance with the clauses of the harmonized European standard UNI EN 14785:2006 confers a presumption of fitness of the appliance covered by annex ZA for the intended uses indicated by the quoted above normative; reference shall be made to the information accompanying the CE marking.

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MEASURING DEVICES

The requirements of the measuring instruments are fulfilled.

Before each qualified measuring analysers were calibrated with zero gas and calibration gas.

Parameter measured	principle	Company	range	uncertainty	Calibration gas
O ₂	paramagnetic	MRU	0 – 21%	±0.1%	0 – 2,5 – 9,0- - 21%
CO ₂	infra-red	MRU	0 – 20 %	±1%	0 – 9 – 18 %
CO	infra-red	MRU	0 – 2000 ppm	±2%	0 – 880 ppm
NO _x	infra-red	MRU	0 – 500 ppm	±2%	0 – 50 – 250 – 450 ppm
OGC	FID	Ratfish	0 -100 ppm	±2%	0 – 90 ppm propane
static pressure	--	MRU	0 – 25 Pa	±0,25 Pa	0 – 20 Pa
temperature: ambient room flue gas surface touchable areas	K thermocouple K thermocouple T thermocouple K thermocouple	National Instruments	10 – 50°C 20 – 1000°C 20 – 250°C 20 – 250 °C	±0.5°C ±2°C ±1°C ±1°C	-- -- -- --
cross-draught	heated thermistor	Schmidt Feintechnik	0 – 20 m/s	±0.1 m/s	--
mass: fuel consumption fuel load particulate emission	balance balance balance	SBP SBP Mettler AT 261	0 – 1500 kg 0 – 10 kg 0.01mg – 205g	±20 g ±0,5 g ±0,06 g	-- -- --

All data were continuously recorded with data logger at intervals of 5 seconds. All raw data is stored for 10 years.

FUEL DATA

Specifications of the test fuel used:

	nominal heat output test
Fuel	wood pellet
Moisture content [%]	6,23
Lower calorific value [KJ/Kg]	17757
Carbon content [% on dry basis]	47,4
Sulphur content [% on dry basis]	0,005
Hydrogen [% on dry basis]	5,6
Size: length [mm] diameter [mm]	12 – 30 (at the origin) 6,0

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