



**Termoplam Ltd.
Testing laboratory**

**Page number: 1
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Republic of Bulgaria, Sofia,
<http://www.termoplam.eu>, e-mail: termoplam2011@abv.bg, GSM 0885 449 216

Test Report

**№ 254
14.09.2022**

I. NAME AND SIGNATURE OF THE TESTED SAMPLE:

Production model: TEMY ES 15

II. NAME AND DESCRIPTION OF THE TESTED SAMPLE:

Wood heating boiler with a rated thermal output of 15 kW, one unit per test.

III. LEGAL DOCUMENT: EN 303-5:2021, EN 304:2017, EN 45001 and EN ISO/IEC 17025:2018.



Picture of the sample

IV. QUANTITY OF THE TESTED SAMPLES: One test sample;

V. MANUFACTURER: "TERMOMONT" d.o.o , Serbia; City: Prhovacka bb, 22310 Simanovci.

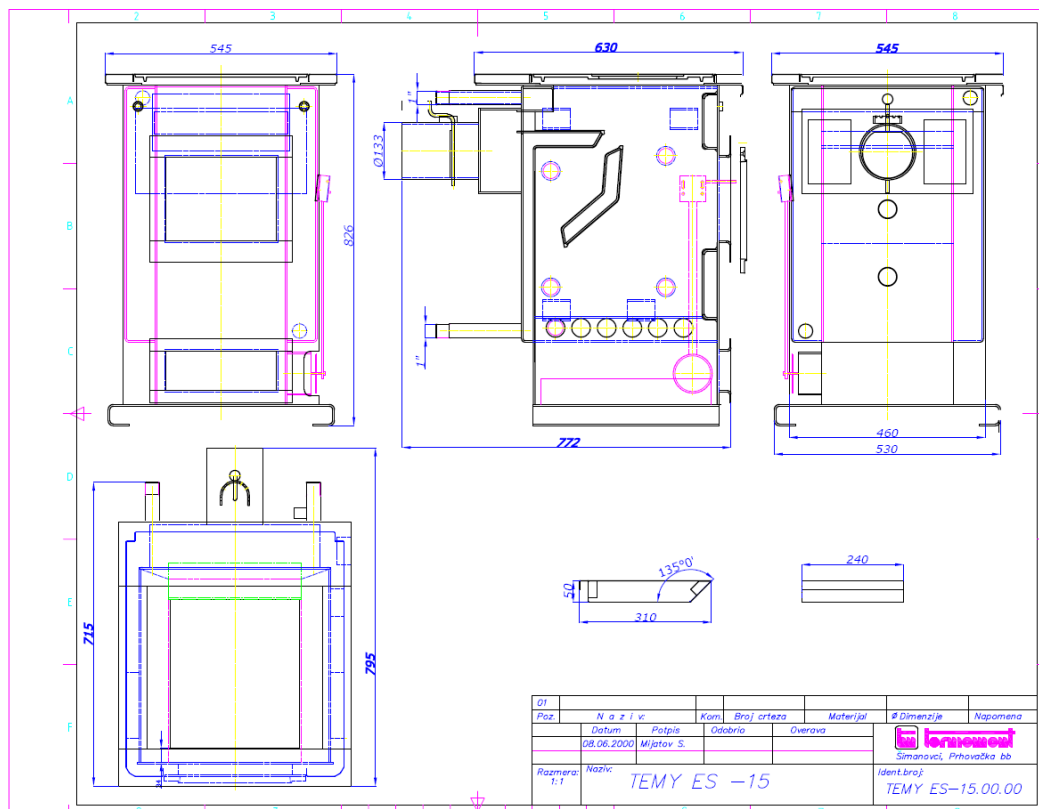
VI TEST APPLICANT: "TERMOMONT" d.o.o , Serbia; City: Prhovacka bb, 22310 Simanovci

VII. PURPOSE AND OBJECT OF THE TEST:

Heating boiler thermal test for defining of:

- 7.1. Nominal heat output;
- 7.2. Test for determining heating boiler efficiency.
- 7.3. Determining emissions from the heating boiler.
- 7.4. Pressure test of the boiler plumbing parts.
- 7.5. Calculation of the seasonal space heating emissions.
- 7.6. Calculation of the seasonal space heating energy efficiency.
- 7.7. Calculation of the energy efficiency index (EEI).

VIII. TECHNICAL FEATURES:



Scheme (drawing of the boiler)

- 8.1. Heat input Q_B - according to section 3.13 from EN 303-5:2021;
- 8.2. Thermal capacity P - according to section 3.6 from EN 303-5:2021;
- 8.3. Efficiency $\eta_k = P/Q_B$ - according to section 4.4.2 and 5.9.3 from EN 303-5:2021.
- 8.4. Boiler weight – without water/ volume of the water jacket:
 - 8.4.1. TEMY ES 15 kW – 160 kg./ 45 l.;

IX. TEST CONDITIONS:

- 9.1. Executor: Termoplam Ltd. Sofia
- 9.2. Weather conditions: Ambient temperature t_L : $\leq 18/18^\circ\text{C}$
(from 15°C to 30°C according to section 5.6.1 or EN 303-5:2021).
- 9.3. Starting Date: 12.09.2022 y. Date of completion: 14.09.2022 y.
- 9.4. Weight of the pilot fuel:
 - 9.4.1. $B_n = 3.6$ kg/h (wood at rated heating output for two semi periods of 2 hour with continuous combustion according according to 5.6.4.1 and 4.4.5 from EN 303-5:2021).
 - 9.4.2. $B_{red} = 1.21$ kg/h (wood at reduced heating output for two semi periods of 2 hour with continuous combustion according according to 5.6.4.1 and 4.4.5 from EN 303-5:2021).
- 9.5. Draft (low pressure in the flue pipe) $\leq 0,15 \div 0,28$ mbar (see section 4.4.4 from EN 303-5:2021).
- 9.6. Fuel type:
 - 9.6.1. Wood with calorific value $H_u = 18320 \pm 60$ kJ/kg according to test report № 9298/30.05.2022 issued by the EUROTTEST - Control SA (see section 5.3 and table 9 from EN 303-5:2021 and specified in the maintenance book).
- 9.7. Temperature of outgoing water $83.5/81.4^\circ\text{C}$ °C (see section 5.7.2 from EN 303-5:2021).
- 9.8. Other conditions :
 - 9.8.1. The test is made under the conditions quoted above and observing the following additional ones:
 - 9.8.1.1. Complied with the safety measures according to EN 303-5:2021 and EN 304;

9.8.1.2. The tested sample meets the instruction for installation and operation according to EN 303-5:2021 and EN 304.

9.9. Used equipment - according to section 5.2 from EN 303-5:2021.

9.10. Recording devices:

9.10.1. Auxiliary devices: PC with software application package.

X. RESULTS FROM THE TEST:

10. Parametres.

10.1. Rated heating output of the boiler P_N according to section 3.7 from EN 303-5:2021.

10.2. Duration of the test rated heating output (two semi periods):

10.2.1. Wood duration of the test ≥ 2 h according to section 5.6.4.1 and 4.4.5 from EN 303-5:2021.

10.3. Maximum temperatures of the elements:

10.3.1 For heating boiler service:

10.3.1.1. Upper door handle ≤ 58.4 °C – according to 4.3.7 from EN 303-5:2021;

10.3.1.2. Lower door handle ≤ 53.3 °C – according to 4.3.7 from EN 303-5:2021

10.4. Real values of the thickness measurement, etc. with additional certificates enclosed.

10.5. After the test of the plumbing parts at pressure $p_{outg}=2 \times PS=2 \times 3.0=6$ [bar] there are no leaks and visible deformations (elastic and plastic) in accordance with section 5.4.1 from EN 303-5:2021.

10.6. Temperature control and limiting devices according to section 4.3.9 from EN 303-5:2021:

In the operating instruction state that a safety valve (outside the boiler) must be installed mandatory.

On page 6 of the installation and operating instructions there is a description of how to connect a boiler to the open system using a safety valve. A connection diagram and the necessary elements are shown.

In page 5 of the installation and operating instructions, a description is provided on how to connect the boiler to the closed system using a safety valve. The scheme shown is for connection to these elements.

10.7. For calculation of the values of Q_B , P and η_K are used formulas from items 5.9.1, item 5.9.2 and item 5.9.3.2 from EN 303-5:2021.

* Values before the slash refer to the test at nominal power, and after it are for minimum power.

Table 1

Measurement	TEMY ES 15		Limit
	nom	min	
Regime	nom	min	-
t_A °C	191	185	
t_L °C	≤18	≤18	15÷30
t_1 upper surface (average value)	≤53.9	≤48.7	≤60+ t_L *= 83
t_2 left wall (average value)	≤53.2	≤46.9	≤60+ t_L *= 83
t_3 right wall (average value)	≤53.1	≤49.6	≤60+ t_L *= 83
$t_{floor\ max}$	≤37.3	≤35.8	≤ 80 *
t upper handle	≤58.4	≤56.6	≤60+ t_L *= 83
t lower handle	≤53.3	≤52.9	≤60+ t_L *= 83
$P_{outg. = 2xPS\ bar}$	6	6	=6 bar
W_1 m ³ /h	685	229	-
t_V °C	83.5	81.4	-
t_R °C	64.5	62.2	70 ÷ 90
B_n kg/h	3.6	1.21	-
P kW	15.18	5.13	
Q_B kW	18.32	6.16	
$\eta_k = P/Q_B$ [%]	83.06	82.26	class 4
CO mg/m ³ ** at 10% O ₂	665.9	555.9	≤700
CO ₂ % vol. part.	9.67	10.83	-
OGC mg/m ³ at 10% O ₂ ***	26.2	19.6	≤ 30
Dust mg/m ³ at 10% O ₂ ****	52.3	42.8	≤60
W % ****	≤30	≤30	-
O ₂ % vol. part.	11.0	9.8	10
NO _x mg/m ³ at 10% O ₂	122.6	101.3	
PN kW	15	-	-

* According to section 4.3.7 from EN 303-5:2021.

** Emission class 5 of the boiler at rated heating output ≤50 kW according to section 4.4.7 and table 7 from EN 303-5:2021.

*** Emission class 5 of the boiler at rated heating output ≤50 kW according to section 4.4.7 and table 7 from EN 303-5:2021.

**** Fuel – wood according to section 5.3, table 9 from EN 303-5:2021.

***** Emission class 5 of the boiler at rated heating output ≤50 kW according to section 4.4.7 and table 7 from EN 303-5:2021.

XI. Seasonal space heating emissions: acc. to table 8, Annex F from EN 303-5:2021, Annex II and Annex III of the REGULATION (EU) 2015/1189:

Table 2

Results	Model boiler	In accordance REGULATION (EU) 2015/1189.
	TEMY ES 15	[mg/Nm ³]
Dust [mg/Nm ³]	44	[PM] ¹ ≤ 60
CO [mg/Nm ³]	572	[CO] ² ≤ 700
OGC [mg/Nm ³]	21	[OGC] ³ ≤ 30
NO _x [mg/Nm ³]	104	[NO _x] ⁴ ≤ 200

Dust content of exhaust gases [PM] ¹ ≤ 60 mg/Nm³ for manual stoked boilers in accordance with point 1 (c), of Annex II of the REGULATION (EU) 2015/1189.

CO of exhaust gases [CO] ² ≤ 700 mg/Nm³ for manual stoked boilers in accordance with point 1 (e), of Annex II of the REGULATION (EU) 2015/1189.

OGC of exhaust gases [OGC] ³ ≤ 30 mg/Nm³ for manual stoked boilers in accordance with point 1 (d), of Annex II of the REGULATION (EU) 2015/1189.

NO_x of exhaust gases [NO_x] ⁴ ≤ 200 mg/Nm³ for biomass boilers in accordance with point 1 (f), of Annex II of the REGULATION (EU) 2015/1189.

XII. Seasonal space heating energy efficiency: acc. to Annex F from EN 303-5:2021, Annex II and Annex III of the REGULATION (EU) 2015/1189:

Table 3

Model boiler	Seasonal space heating energy efficiency η_s %	In accordance REGULATION (EU) 2015/1189 [η_s] [%]
TEMY ES 15	80	[η_s] ¹ ≥ 75

Where:

- η_s % - the seasonal space heating energy efficiency:

[η_s] ¹ ≥ 75 % for boilers with a rated heat output of 20 kW or less in accordance with point 1 (a), of Annex II of the REGULATION (EU) 2015/1189.

XII. Energy efficiency index (EEI): acc. to Annex F from EN 303-5:2021, Annex II and Annex VIII of the REGULATION (EU) 2015/1187:

Table 3

Model boiler	Energy efficiency index EEI	Energy efficiency class
TEMY ES 15	117	A+

The energy efficiency index is calculated according to:

- 12.1. The requirements and the formulas of ANNEX VIII of REGULATION (EU) 2015/1187;
- 12.2. The energy efficiency index is calculated on the database provided by manufacturer for boiler burning wood;
- 12.3. The energy efficiency index is set for preferred fuel: wood according section 5.6.4.1 and section 5.3 from EN 303-5:2021.
- 12.4. Energy efficiency class is determined based on the energy efficiency index EEI according to Table 1 of ANNEX II of REGULATION (EU) 2015/1187.

XIII. ENCLOSURES:

- 13.1. Prints of the results from page: 5.
- 13.2. Instruction for installation and operation - Yes.
- 13.3. Assembly drawing of the sample: 1.
- 13.4. Certificates (annexs A, B, and C): 3.



MANAGER:
(eng. Pl. Iliev)

NOTE:

The test results relate only to the tested samples.
Extracts from the test report can't be reproduced without written agreement of the testing laboratory.
This document is only informative.

Annex A
Certificate of steel sheet with a thickness of 5 mm

HMS GROUP Serbia Iron & Steel in Belgrade, Bulevar Mihajla Pupina 6,
Belgrade-New Belgrade,
11000 Belgrade, Republic of Serbia



INSPECTION CERTIFICATE: 3.1 EN 10204:2004
-uverenje o ispitivanju-

PAGE No: 1
(strana br):

PURCHASER: ATENIC COMMERCE D.O.O.
(kupac) CACAK CERTIFICATE No 75340
BULEVAR OSLOBODILACA CACKA 91 (uverenje broj)
TRADING CO: ATENIC COMMERCE D.O.O.
(izvoznik) CACAK PURCHASE ORDER
(primalac) BULEVAR OSLOBODILACA CACKA 91 ITEM:
PRODUCT: HOT ROLLED COILS CONTRACT No. ATEN1082RS
(proizvod) (ugovor broj)
DIMENSIONS: 5,000 X 1500 X
(dimenzije, mm) EN 10051/2010
QUALITY: S235JR4AR T: HR+CE
(kvalitet) EN 10025-2/2019 DATE OF ISSUE 26/08/2022
Net weight (kg): 26980 (dat. izdavanja)
DELIVERY CONDITIONS : AR
(STANJE ISPORUKE) Transport: CA061YD

MECHANICAL PROPERTIES - MEH.TEH.OSOBINE									
COIL No.	Heat No.	PACK No.	Impact test	Bend	Hardness	Melt			
(kotur br.)	(šarža)	(Re)	(Rm)	(Re/1A)	KV2	(test)	(tvrdoća)	(furn)	
		(paket br.)	(Rm)	(Elo)	(šilavost)				
			Ing.	Sr.	Vr.	1	2	3	S
			MPa	MPa					Proiz.
			%	J	T°C	J	J	J	180°
									HRB HV10
2F67012	381686	327 453	,72	28					Y
2F69018	168605	313 433	,72	35					Y

CHEMICAL COMPOSITION OF HEAT - HEMIJSKI SASTAV SARZE (%)		
	381686	168605
C	0,12	0,12
Mn	0,76	0,73
Si	0,012	0,009
P	0,011	0,014
S	0,007	0,010
Al	0,049	0,046
Cu	0,04	0,05
Cr	0,02	0,03
Ni	0,02	0,02
Mo	0,004	0,004
Ti	0,002	0,002
V	0,003	0,002
Nb	0,003	0,002
N	0,006	0,006
B	<0,0001	<0,0001
CEV	0,26	0,26

Measured values of alpha and beta/gamma surface contamination of the examined goods are for alpha emitters lower than 4 Bq/100cm², as well as for beta/gamma emitters lower than 40 Bq/100cm²
We hereby declare that above mentioned products were manufactured in accordance with specifications and contract requirements.

Document is valid without signature and stamp. QUALITY ASSURANCE OBEZBEDJENJE KVALITETA



Annex B
Certificate of seal



Firewheel Industrial Corporation

Headquarters: RM2101, 21/F, Yaojiang International Plaza,
No. 258 Wuxong Road, Shanghai 200082, P.R. China.
Tel: 86-21-63096460 to 82 Fax: 86-21-63096483

- ★ High temperature resistant glass fiber and ceramic fiber textiles
- ★ Sealing packing and gasket
- ★ Engineering plastic materials
- ★ Rubber sheeting and molded parts
- ★ Thermal and acoustic insulation materials
- ★ Electrical insulation materials

QUALITY CERTIFICATE

MESSRS
TEHNIKA KB

ISSUING DATE:
AUG.31,2021

SUPPLIER: FIREWHEEL INDUSTRIAL CORPORATION

DESCRIPTION	FG103T TEXTURIZED FIBERGLASS BRAIDED SQUARE PACKING	SIZE	14MM,18MM,30M M		
INVOICE.NO.	FWG21NP05	QUANTITY	SEE INVOICE		
INSPECTION DATE	AUG.24,2021	PRODUCTION DATE	AUG.27,2021		
ITEM	SPEC. ACC. TO FIREWHEEL TDS	INSPECTION RESULT	COMMENTS		
TEMP	500C	500C	GOOD		
CONCLUSION:	QUALIFIED				
APPLICABILITY OF THE GOODS	FOR THE GOODS ON STOCK - 2 YEARS, FOR THE GOODS INSTALLED ACC. INSTRUCTIONS - 1 YEAR.OR DEPENDS				
CHECKED BY	王浩然	QUALITY MANAGER	舒菲菲	DIRECTOR	甘露泉

NOTES:

1. STORAGE OF THE GOODS: KEEP IN DRY, CLEAN AND WELL-VENTILATED PLACES AND STOCKS.
2. THE GOODS SHOULD BE KEPT AWAY FROM RAIN, HUMIDITY AND ANY OTHER UNFAVORABLE CONDITIONS.
3. HANDLE, STORAGE AND TRANSPORTATION WITH CARE TO AVOID ANY DAMAGE.

Annex C
Certificate of welding electrode

voestalpine Böhler Welding Germany GmbH

voestalpine Böhler Welding Germany GmbH
Hafenstr. 21 | D-69007 Hamm
Postfach 2561 | D-56015 Hamm
www.voestalpine.com/welding

voestalpine Bohler Welding Romania

Inspection certificate 3.1

Sos.Braila 2
120118 Buzau
Rumania

as per : EN 10204
No. : 1-2022-02082022/4-014
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PO no.	093	of	14.04.2022
Order no.			
Delivery note (pos./split)		of	
Product	GMAW wire electrode		
Trade name	BÖHLER EMK 6		
Standard designation	AWS A5.18: ER70S-6 EN ISO 14341 -A - G 42 4 M21 3Si1 / G 42 4 C1 3Si1		
Dimension	1,0 mm		350135
Heat no.	220081		50850
Quantity	9072,0 kg		32182152 4829

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu	Ti	Al	Zr		
0,07	0,84	1,44	0,009	0,014	0,03	< 0,01	0,01	< 0,01	0,12	< 0,01	< 0,01	< 0,01		

Mechanical properties

EN 10204 - 2.2

Tensile test							
T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Remarks
20°C	≥ 420		500 - 640	≥ 20			M21
Impact test							
T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks	
-40°C	≥ 47					M21	

Town
Hamm

Date
02.08.2022

This certificate was issued by DP-equipment and does not require signature.

Authorized representative
Stein