



**Termoplam Ltd.
Testing laboratory**

**Page number: 1
Number of pages: 12**

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Test Report

**№ 252
08.09.2022**

I. NAME AND SIGNATURE OF THE TESTED SAMPLE:

Production model: MEGAL-M20

II. NAME AND DESCRIPTION OF THE TESTED SAMPLE:

Wood heating boiler with a rated thermal output of 20 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: "MEGAL" A.D, 17520 Bujanovac, Lopardinski put b.b, Serbia.

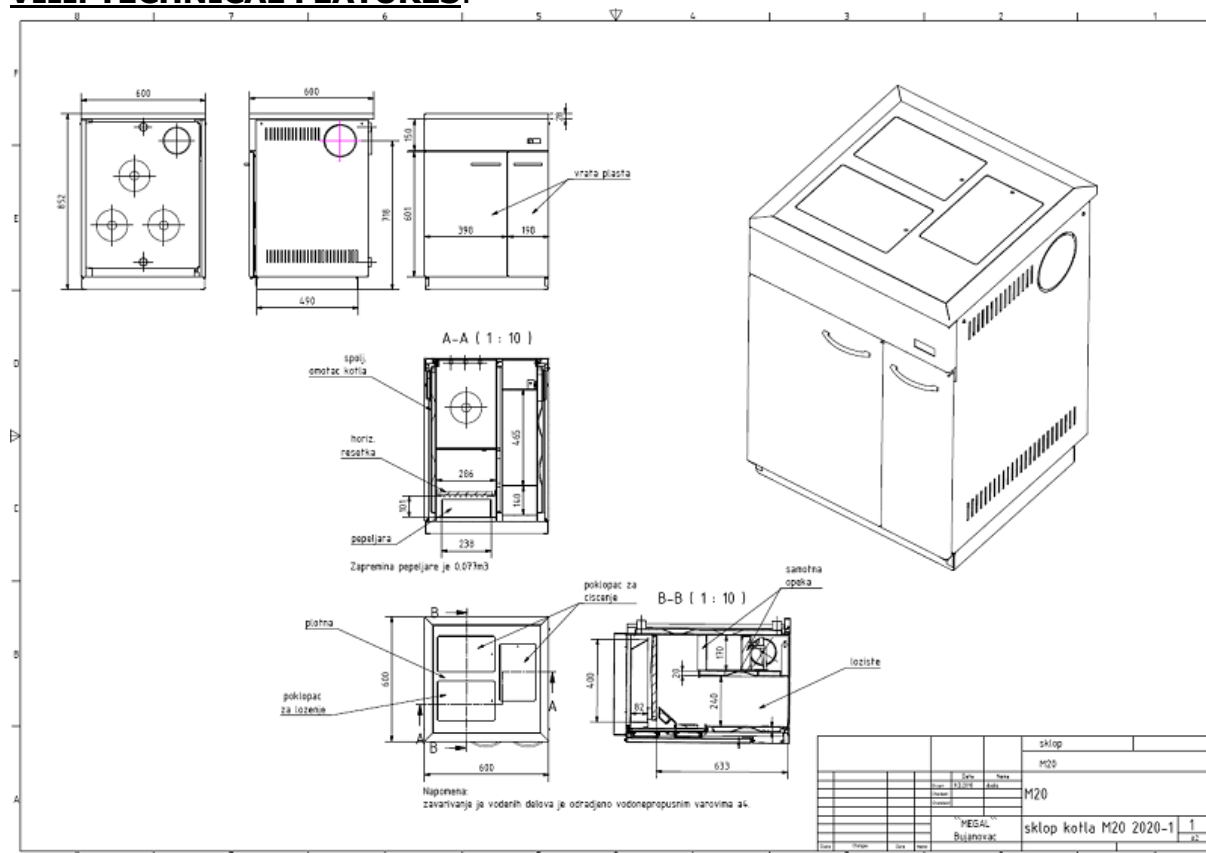
VI TEST APPLICANT: "MEGAL" A.D, 17520 Bujanovac, Lopardinski put b.b, Serbia.

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. MEGAL-M20 kW – 168 kg./ 38 l.;

IX. TEST CONDITIONS:

- 9.1. Executor: Termoplam Ltd. Sofia
- 9.2. Weather conditions: Ambient temperature t_L : $\leq 19/19^\circ\text{C}$
(from 15°C to 30°C according to section 5.6.1 or EN 303-5:2021).
- 9.3. Starting Date: 06.09.2022 y. Date of completion: 08.09.2022 y.
- 9.4. Weight of the pilot fuel:
 - 9.4.1. $B_n = 4.7$ 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. $B_{red} = 1,6$ 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 $86.7/85.3^\circ\text{C}$ $^\circ\text{C}$ (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. Handle of the door ≤ 58.9 °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 $p_{outg}=2 \times PS=2 \times 2.5=5$ [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:

The operating instructions on page 9 state that a safety valve (outside the boiler) must be installed.

On page 8 picture 1 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 9 picture 2 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	MEGAL-M20		Limit
Regime	nom	min	-
t_A °C	210	194	
t_L °C	≤ 19	≤ 19	$15 \div 30$
t_1 upper surface (average value)	≤ 54.6	≤ 50.6	$\leq 60 + t_L^* = 83$
t_2 left wall (average value)	≤ 55.2	≤ 49.9	$\leq 60 + t_L^* = 83$
t_3 right wall (average value)	≤ 59.1	≤ 49.2	$\leq 60 + t_L^* = 83$
$t_{\text{floor max}}$	≤ 37.4	≤ 35.8	$\leq 80^*$
t upper handle	≤ 58.9	≤ 57.0	$\leq 60 + t_L^* = 83$
t lower handle	-	-	$\leq 60 + t_L^* = 83$
$P_{\text{outg.}}$ = 2xPS bar	5	5	= 5 bar
W_1 m ³ /h	950	318	-
t_v °C	86.7	85.3	-
t_R °C	68.5	66.9	$70 \div 90$
B_n kg/h	4.7	1.6	-
P kW	20.17	6.83	
Q_B kW	23.92	8.14	
$\eta_K = P/Q_B$ [%]	84.52	83.95	class 4
CO mg/m ³ ** at 10% O ₂	677.5	548.7	≤ 700
CO ₂ % vol. part.	6.77	7.54	-
OGC mg/m ³ at 10% O ₂ ***	27.4	24.9	≤ 30
Dust mg/m ³ at 10% O ₂ *****	55.6	48.2	≤ 60
W % *****	≤ 30	≤ 30	-
O ₂ % vol. part.	14.0	13.2	10
NO _x mg/m ³ at 10% O ₂	199.4	148.3	
PN kW	20	-	-

* 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.
	MEGAL-M20	[mg/Nm ³]
Dust [mg/Nm ³]	49	[PM] ¹ ≤ 60
CO [mg/Nm ³]	568	[CO] ² ≤ 700
OGC [mg/Nm ³]	25	[OGC] ³ ≤ 30
NO _x [mg/Nm ³]	156	[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] [%]
MEGAL-M20	82	[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
MEGAL-M20	119	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, C, D, and E): 5.



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

HRB GROUP Serbia Iron & Steel Bldg Belgrade, Bulvar Mihajla Pupina 6,
Belgrade-Sremski Belgrade,
11000 Belgrade, Republic of Serbia



13
0048-098-001

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

PAGE No: 1
(strana br):

PURCHASER: ATENIC COMMERCE D.O.O.
(kupac) CACAK
BULEVAR OSLOBODILACA CACKA 91
TRADING CO: ATENIC COMMERCE D.O.O.
(izvoznik) CACAK
(primalac) BULEVAR OSLOBODILACA CACKA 91
PRODUCT: HOT ROLLED COILS
(proizvod)
DIMENSIONS: 5,000 X 1500 X
(dimenzije, mm) EN 10051/2010
QUALITY: S215JR+AR
(kvalitet) EN 10025-2/2019
Net weight(kg): 43260
DELIVERY CONDITIONS : AR
(STANJE ISPORUKE)
Transport: 347446685070

CERTIFICATE No 54137
(uverenja broj)
PURCHASE ORDER
ITEM:
CONTRACT No. ATEN1071RS
(ugovor broj)
T: HR+CE
DATE OF ISSUE 31/07/2021
(dat. izdavanja)

MECHANICAL PROPERTIES - MEH.TEH.OSOBINE
COIL No, Heat No:
PACK No, Impact test, Bend, Hardness, Melt
(kotur br. / šarta / Re / Rm / Ra / A / KV2 / test / (tvrdoća) / furn
(pakat br) / Rm (Elong) / (zlatavost) / Inclin
(MPa/MPa) / (Sr.Vr. 1 2 3 / S / inacin
(% / J T°C / J J J / 180° / HRB HV10
1P18016 881486 312 446 ,70 30 Y
1P18017 377157 322 452 ,71 28 Y

CHEMICAL COMPOSITION OF HEAT - HEMIJSKI SASTAV SARJE (%)
881486 377157
C 0,12 0,12
Mn 0,77 0,78
Si 0,016 0,016
P 0,010 0,016
S 0,009 0,012
Al 0,039 0,047
Cu 0,10 0,07
Cr 0,03 0,04
Ni 0,04 0,03
Mo 0,006 0,006
Ti 0,002 0,002
V 0,002 0,002
Nb 0,003 0,002
N 0,006 0,007
B 0,0001 0,0001
CEV 0,26 0,27

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
Steel composition certificate

ISD DUNAFERR

INSPECTION CERTIFICATE 3.1

ISO 9001

Page 1 (2)

		A DOKUMENTUM ELEKTRONIKUSAN HITELENTETTT A KÉRDÉSEK VÁLASZOLÁSÁRA Működési rendszert: NETLOCK		THIS DOCUMENT IS DIGITALLY SIGNED AND TIME-STAMPED For validation please visit: www.isdnetlock.hu	
A07 Purchase contract no. HRC December II		A08.1 Order No./Item: 0004222692000002		A08.2 Contract No.: 0004222692000014	
A09 Statement No.: 0027477157/000014		B02 Quality marking: P265GH +H		B02 Quality standard: EN 10028-2:2017	
A01 Product's Plant: ISD DUNAFERR ZRT, 3400 DUNAÚJVÁROS, VASÚT TÉR 1-3.		A02 Type of statement: 3.1-EN 10204-2004		B10 Validity: 2020.03.09	
A03.1 Name of customer: DAK COMERC DOO		A03.2 Address of customer: Serbia, 21000, NOVI SAD, TEMERINSKI PUT 21.		A10 Delivery date: 2020.03.09	
A04 Metal stamp:		A06.2 Place of destination: DAK COMERC DOO, Serbia, 21000, NOVI SAD, TEMERINSKI PUT 21.		B01.1 Name of product: Hot rolled coil (Plain)	
B03 Supplementary requirements: Surface according to EN 10165-2 standard class B / sub-class 3.		B05 Reference (test/treatment of samples):		B01.2 Dimensions standard: EN 10091-2010	
		B06 Marking of the product: (Z04)		B01.3 Class: E	
		B04 Delivery terms of the product: Normalised		C05 Place of inspection:	

IDENTIFICATION OF THE PRODUCT											
B07.1 Charge No.	C76 Steel prod. Procedure	C00 Sample No.	B07.2 Coil/slide No.	B08 Pieces (pc)	B12 Theoretical mass (t)	B13 Actual mass (t)	C02 Coiling temp.	B09 Width (mm)	B10 Thickness (mm)	B11 Length (mm)	B14 Total mass (t)
663660	LD	90000772731	D48276000			22,870		1500x20	5		45,490
663660	LD	90000772732	D48276000			22,620					

DVP 2020.03.09 12:34:41

ISD DUNAFERR

INSPECTION CERTIFICATE 3.1

ISO 9001

Page 2 (2)

CHEMICAL INSPECTION		A03 Statement No.: 0027477157/000014																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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		C71 C	C72 Mn	C73 Si	C74 S	C75 P	C76 N	C77 Al	C78 Cu	C79 Cr	C80 Ni	C81 V	C82 Nb	C83 Ti	C84 B	C85 Ca	C86 Mo	C87 O	C88 Zn	C89 As	C90 Sn	C91 W	C92 Co	C93 Cu	C94 Cr	C95 Ni	C96 Mn	C97 Mo	C98 Nb	C99 Ti	C100 B	C101 Ca	C102 Mg	C103 Zn	C104 As	C105 Sn	C106 W	C107 Co	C108 Cu	C109 Cr	C110 Ni	C111 Mn	C112 Mo	C113 Nb	C114 Ti	C115 B	C116 Ca	C117 Mg	C118 Zn	C119 As	C120 Sn	C121 W	C122 Co	C123 Cu	C124 Cr	C125 Ni	C126 Mn	C127 Mo	C128 Nb	C129 Ti	C130 B	C131 Ca	C132 Mg	C133 Zn	C134 As	C135 Sn	C136 W	C137 Co	C138 Cu	C139 Cr	C140 Ni	C141 Mn	C142 Mo	C143 Nb	C144 Ti	C145 B	C146 Ca	C147 Mg	C148 Zn	C149 As	C150 Sn	C151 W	C152 Co	C153 Cu	C154 Cr	C155 Ni	C156 Mn	C157 Mo	C158 Nb	C159 Ti	C160 B	C161 Ca	C162 Mg	C163 Zn	C164 As	C165 Sn	C166 W	C167 Co	C168 Cu	C169 Cr	C170 Ni	C171 Mn	C172 Mo	C173 Nb	C174 Ti	C175 B	C176 Ca	C177 Mg	C178 Zn	C179 As	C180 Sn	C181 W	C182 Co	C183 Cu	C184 Cr	C185 Ni	C186 Mn	C187 Mo	C188 Nb	C189 Ti	C190 B	C191 Ca	C192 Mg	C193 Zn	C194 As	C195 Sn	C196 W	C197 Co	C198 Cu	C199 Cr	C200 Ni	C201 Mn	C202 Mo	C203 Nb	C204 Ti	C205 B	C206 Ca	C207 Mg	C208 Zn	C209 As	C210 Sn	C211 W	C212 Co	C213 Cu	C214 Cr	C215 Ni	C216 Mn	C217 Mo	C218 Nb	C219 Ti	C220 B	C221 Ca	C222 Mg	C223 Zn	C224 As	C225 Sn	C226 W	C227 Co	C228 Cu	C229 Cr	C230 Ni	C231 Mn	C232 Mo	C233 Nb	C234 Ti	C235 B	C236 Ca	C237 Mg	C238 Zn	C239 As	C240 Sn	C241 W	C242 Co	C243 Cu	C244 Cr	C245 Ni	C246 Mn	C247 Mo	C248 Nb	C249 Ti	C250 B	C251 Ca	C252 Mg	C253 Zn	C254 As	C255 Sn	C256 W	C257 Co	C258 Cu	C259 Cr	C260 Ni	C261 Mn	C262 Mo	C263 Nb	C264 Ti	C265 B	C266 Ca	C267 Mg	C268 Zn	C269 As	C270 Sn	C271 W	C272 Co	C273 Cu	C274 Cr	C275 Ni	C276 Mn	C277 Mo	C278 Nb	C279 Ti	C280 B	C281 Ca	C282 Mg	C283 Zn	C284 As	C285 Sn	C286 W	C287 Co	C288 Cu	C289 Cr	C290 Ni	C291 Mn	C292 Mo	C293 Nb	C294 Ti	C295 B	C296 Ca	C297 Mg	C298 Zn	C299 As	C300 Sn	C301 W	C302 Co	C303 Cu	C304 Cr	C305 Ni	C306 Mn	C307 Mo	C308 Nb	C309 Ti	C310 B	C311 Ca	C312 Mg	C313 Zn	C314 As	C315 Sn	C316 W	C317 Co	C318 Cu	C319 Cr	C320 Ni	C321 Mn	C322 Mo	C323 Nb	C324 Ti	C325 B	C326 Ca	C327 Mg	C328 Zn	C329 As	C330 Sn	C331 W	C332 Co	C333 Cu	C334 Cr	C335 Ni	C336 Mn	C337 Mo	C338 Nb	C339 Ti	C340 B	C341 Ca	C342 Mg	C343 Zn	C344 As	C345 Sn	C346 W	C347 Co	C348 Cu	C349 Cr	C350 Ni	C351 Mn	C352 Mo	C353 Nb	C354 Ti	C355 B	C356 Ca	C357 Mg	C358 Zn	C359 As	C360 Sn	C361 W	C362 Co	C363 Cu	C364 Cr	C365 Ni	C366 Mn	C367 Mo	C368 Nb	C369 Ti	C370 B	C371 Ca	C372 Mg	C373 Zn	C374 As	C375 Sn	C376 W	C377 Co	C378 Cu	C379 Cr	C380 Ni	C381 Mn	C382 Mo	C383 Nb	C384 Ti	C385 B	C386 Ca	C387 Mg	C388 Zn	C389 As	C390 Sn	C391 W	C392 Co	C393 Cu	C394 Cr	C395 Ni	C396 Mn	C397 Mo	C398 Nb	C399 Ti	C400 B	C401 Ca	C402 Mg	C403 Zn	C404 As	C405 Sn	C406 W	C407 Co	C408 Cu	C409 Cr	C410 Ni	C411 Mn	C412 Mo	C413 Nb	C414 Ti	C415 B	C416 Ca	C417 Mg	C418 Zn	C419 As	C420 Sn	C421 W	C422 Co	C423 Cu	C424 Cr	C425 Ni	C426 Mn	C427 Mo	C428 Nb	C429 Ti	C430 B	C431 Ca	C432 Mg	C433 Zn	C434 As	C435 Sn	C436 W	C437 Co	C438 Cu	C439 Cr	C440 Ni	C441 Mn	C442 Mo	C443 Nb	C444 Ti	C445 B	C446 Ca	C447 Mg	C448 Zn	C449 As	C450 Sn	C451 W	C452 Co	C453 Cu	C454 Cr	C455 Ni	C456 Mn	C457 Mo	C458 Nb	C459 Ti	C460 B	C461 Ca	C462 Mg	C463 Zn	C464 As	C465 Sn	C466 W	C467 Co	C468 Cu	C469 Cr	C470 Ni	C471 Mn	C472 Mo	C473 Nb	C474 Ti	C475 B	C476 Ca	C477 Mg	C478 Zn	C479 As	C480 Sn	C481 W	C482 Co	C483 Cu	C484 Cr	C485 Ni	C486 Mn	C487 Mo	C488 Nb	C489 Ti	C490 B	C491 Ca	C492 Mg	C493 Zn	C494 As	C495 Sn	C496 W	C497 Co	C498 Cu	C499 Cr	C500 Ni	C501 Mn	C502 Mo	C503 Nb	C504 Ti	C505 B	C506 Ca	C507 Mg	C508 Zn	C509 As	C510 Sn	C511 W	C512 Co	C513 Cu	C514 Cr	C515 Ni	C516 Mn	C517 Mo	C518 Nb	C519 Ti	C520 B	C521 Ca	C522 Mg	C523 Zn	C524 As	C525 Sn	C526 W	C527 Co	C528 Cu	C529 Cr	C530 Ni	C531 Mn	C532 Mo	C533 Nb	C534 Ti	C535 B	C536 Ca	C537 Mg	C538 Zn	C539 As	C540 Sn	C541 W	C542 Co	C543 Cu	C544 Cr	C545 Ni	C546 Mn	C547 Mo	C548 Nb	C549 Ti	C550 B	C551 Ca	C552 Mg	C553 Zn	C554 As	C555 Sn	C556 W	C557 Co	C558 Cu	C559 Cr	C560 Ni	C561 Mn	C562 Mo	C563 Nb	C564 Ti	C565 B	C566 Ca	C567 Mg	C568 Zn	C569 As	C570 Sn	C571 W	C572 Co	C573 Cu	C574 Cr	C575 Ni	C576 Mn	C577 Mo	C578 Nb	C579 Ti	C580 B	C581 Ca	C582 Mg	C583 Zn	C584 As	C585 Sn	C586 W	C587 Co	C588 Cu	C589 Cr	C590 Ni	C591 Mn	C592 Mo	C593 Nb	C594 Ti	C595 B	C596 Ca	C597 Mg	C598 Zn	C599 As	C600 Sn	C601 W	C602 Co	C603 Cu	C604 Cr	C605 Ni	C606 Mn	C607 Mo	C608 Nb	C609 Ti	C610 B	C611 Ca	C612 Mg	C613 Zn	C614 As	C615 Sn	C616 W	C617 Co	C618 Cu	C619 Cr	C620 Ni	C621 Mn	C622 Mo	C623 Nb	C624 Ti	C625 B	C626 Ca	C627 Mg	C628 Zn	C629 As	C630 Sn	C631 W	C632 Co	C633 Cu	C634 Cr	C635 Ni	C636 Mn	C637 Mo	C638 Nb	C639 Ti	C640 B	C641 Ca	C642 Mg	C643 Zn	C644 As	C645 Sn	C646 W	C647 Co	C648 Cu	C649 Cr	C650 Ni	C651 Mn	C652 Mo	C653 Nb	C654 Ti	C655 B	C656 Ca	C657 Mg	C658 Zn	C659 As	C660 Sn	C661 W	C662 Co	C663 Cu	C664 Cr	C665 Ni	C666 Mn	C667 Mo	C668 Nb	C669 Ti	C670 B	C671 Ca	C672 Mg	C673 Zn	C674 As	C675 Sn	C676 W	C677 Co	C678 Cu	C679 Cr	C680 Ni	C681 Mn	C682 Mo	C683 Nb	C684 Ti	C685 B	C686 Ca	C687 Mg	C688 Zn	C689 As	C690 Sn	C691 W	C692 Co	C693 Cu	C694 Cr	C695 Ni	C696 Mn	C697 Mo	C698 Nb	C699 Ti	C700 B	C701 Ca	C702 Mg	C703 Zn	C704 As	C705 Sn	C706 W	C707 Co	C708 Cu	C709 Cr	C710 Ni	C711 Mn	C712 Mo	C713 Nb	C714 Ti	C715 B	C716 Ca	C717 Mg	C718 Zn	C719 As	C720 Sn	C721 W	C722 Co	C723 Cu	C724 Cr	C725 Ni	C726 Mn	C727 Mo	C728 Nb	C729 Ti	C730 B	C731 Ca	C732 Mg	C733 Zn	C734 As	C735 Sn	C736 W	C737 Co	C738 Cu	C739 Cr	C740 Ni	C741 Mn	C742 Mo	C743 Nb	C744 Ti	C745 B	C746 Ca	C747 Mg	C748 Zn	C749 As	C750 Sn	C751 W	C752 Co	C753 Cu	C754 Cr	C755 Ni	C756 Mn	C757 Mo	C758 Nb	C759 Ti	C760 B	C761 Ca	C762 Mg	C763 Zn	C764 As	C765 Sn	C766 W	C767 Co	C768 Cu	C769 Cr	C770 Ni	C771 Mn	C772 Mo	C773 Nb	C774 Ti	C775 B	C776 Ca	C777 Mg	C778 Zn	C779 As	C780 Sn	C781 W	C782 Co	C783 Cu	C784 Cr	C785 Ni	C786 Mn	C787 Mo	C788 Nb	C789 Ti	C790 B	C791 Ca	C792 Mg	C793 Zn	C794 As	C795 Sn	C796 W	C797 Co	C798 Cu	C799 Cr	C800 Ni	C801 Mn	C802 Mo	C803 Nb	C804 Ti	C805 B	C806 Ca	C807 Mg	C808 Zn	C809 As	C810 Sn	C811 W	C812 Co	C813 Cu	C814 Cr	C815 Ni	C816 Mn	C817 Mo	C818 Nb	C819 Ti	C820 B	C821 Ca	C822 Mg	C823 Zn	C824 As	C825 Sn	C826 W	C827 Co	C828 Cu	C829 Cr	C830 Ni	C831 Mn	C832 Mo	C833 Nb	C834 Ti	C835 B	C836 Ca	C837 Mg	C838 Zn	C839 As	C840 Sn	C841 W	C842 Co	C843 Cu	C844 Cr	C845 Ni	C846 Mn	C847 Mo	C848 Nb	C849 Ti	C850 B	C851 Ca	C852 Mg	C853 Zn	C854 As	C855 Sn	C856 W	C857 Co	C858 Cu	C859 Cr	C860 Ni	C861 Mn	C862 Mo	C863 Nb	C864 Ti	C865 B	C866 Ca	C867 Mg	C868 Zn	C869 As	C870 Sn	C871 W	C872 Co	C873 Cu	C874 Cr	C875 Ni	C876 Mn	C877 Mo	C878 Nb	C879 Ti	C880 B	C881 Ca	C882 Mg	C883 Zn	C884 As	C885 Sn	C886 W	C887 Co	C888 Cu	C889 Cr	C890 Ni	C891 Mn	C892 Mo	C893 Nb	C894 Ti	C895 B	C896 Ca	C897 Mg	C898 Zn	C899 As	C900 Sn	C901 W	C902 Co	C903 Cu	C904 Cr	C905 Ni	C906 Mn	C907 Mo	C908 Nb	C909 Ti	C910 B	C911 Ca	C912 Mg	C913 Zn	C914 As	C915 Sn	C916 W	C917 Co	C918 Cu	C919 Cr	C920 Ni	C921 Mn	C922 Mo	C923 Nb	C924 Ti	C925 B	C926 Ca	C927 Mg	C928 Zn	C929 As	C930 Sn	C931 W	C932 Co	C933 Cu	C934 Cr	C935 Ni	C936 Mn	C937 Mo	C938 Nb	C939 Ti	C940 B	C941 Ca	C942 Mg	C943 Zn	C944 As	C945 Sn	C946 W	C947 Co	C948 Cu	C949 Cr	C950 Ni	C951 Mn	C952 Mo	C953 Nb	C954 Ti	C955 B	C956 Ca	C957 Mg	C958 Zn	C959 As	C960 Sn	C961 W	C962 Co	C963 Cu	C964 Cr	C965 Ni	C966 Mn	C967 Mo	C968 Nb	C969 Ti	C970 B	C971 Ca	C972 Mg	C973 Zn	C974 As	C975 Sn	C976 W	C977 Co	C978 Cu	C979 Cr	C980 Ni	C981 Mn	C982 Mo	C983 Nb	C984 Ti	C985 B	C986 Ca	C987 Mg	C988 Zn	C989 As	C990 Sn	C991 W	C992 Co	C993 Cu	C994 Cr	C995 Ni	C996 Mn	C997 Mo	C998 Nb	C999 Ti	C1000 B	C1001 Ca	C1002 Mg	C1003 Zn	C1004 As	C1005 Sn	C1006 W	C1007 Co	C1008 Cu	C1009 Cr	C1010 Ni	C1011 Mn	C1012 Mo	C1013 Nb	C1014 Ti	C1015 B	C1016 Ca	C1017 Mg	C1018 Zn	C1019 As	C1020 Sn	C1021 W	C1022 Co	C1023 Cu	C1024 Cr	C1025 Ni	C1026 Mn	C1027 Mo	C1028 Nb	C1029 Ti	C1030 B	C1031 Ca	C1032 Mg	C1033 Zn	C1034 As	C1035 Sn	C1036 W	C1037 Co	C1038 Cu	C1039 Cr	C1040 Ni	C1041 Mn	C1042 Mo	C1043 Nb	C1044 Ti	C1045 B	C1046 Ca	C1047 Mg	C1048 Zn	C1049 As	C1050 Sn	C1051 W	C1052 Co	C1053 Cu	C1054 Cr	C1055 Ni	C1056 Mn	C1057 Mo	C1058 Nb	C1059 Ti	C1060 B	C1061 Ca	C1062 Mg	C1063 Zn	C1064 As	C1065 Sn	C1066 W	C1067 Co	C1068 Cu	C1069 Cr	C1070 Ni	C1071 Mn	C1072 Mo	C1073 Nb	C1074 Ti	C1075 B	C1076 Ca	C1077 Mg	C1078 Zn	C1079 As	C1080 Sn	C1081 W	C1082 Co	C1083 Cu	C1084 Cr	C1085 Ni	C1086 Mn	C1087 Mo	C1088 Nb	C1089 Ti	C1090 B	C1091 Ca	C1092 Mg	C1093 Zn	C1094 As	C1095 Sn	C1096 W	C1097 Co	C1098 Cu	C1099 Cr	C1100 Ni	C1101 Mn	C1102 Mo	C1103 Nb	C1104 Ti	C1105 B	C1106 Ca	C1107 Mg	C1108 Zn	C1109 As	C1110 Sn	C1111 W	C1112 Co	C1113 Cu	C1114 Cr	C1115 Ni	C1116 Mn	C1117 Mo	C1118 Nb	C1119 Ti	C1120 B	C1121 Ca	C1122 Mg	C1123 Zn	C1124 As	C1125 Sn	C1126 W	C1127 Co	C1128 Cu	C1129 Cr	C1130 Ni	C1131 Mn	C1132 Mo	C1133 Nb	C1134 Ti	C1135 B	C1136 Ca	C1137 Mg	C1138 Zn	C1139 As	C1140 Sn	C1141 W	C1142 Co	C1143 Cu	C1144 Cr	C1145 Ni	C1146 Mn	C1147 Mo	C1148 Nb	C1149 Ti	C1150 B	C1151 Ca	C1152 Mg	C1153 Zn	C1154 As	C1155 Sn	C1156 W	C1157 Co	C1158 Cu	C1159 Cr	C1160 Ni	C1161 Mn	C1162 Mo	C1163 Nb	C1164 Ti	C1165 B	C1166 Ca	C1167 Mg	C1168 Zn	C1169 As	C1170 Sn	C1171 W	C1172 Co	C1173 Cu	C1174 Cr	C1175 Ni	C1176 Mn	C1177 Mo	C1178 Nb	C1179 Ti	C1180 B	C1181 Ca	C1182 Mg	C1183 Zn	C1184 As	C1185 Sn	C1186 W	C1187 Co	C1188 Cu	C1189 Cr	C1190 Ni	C1191 Mn	C1192 Mo	C1193 Nb	C1194 Ti	C1195 B	C1196 Ca	C1197 Mg	C1198 Zn	C1199 As	C1200 Sn	C1201 W	C1202 Co	C1203 Cu	C1204 Cr	C1205 Ni	C1206 Mn	C1207 Mo	C1208 Nb	C1209 Ti	C1210 B	C1211 Ca	C1212 Mg	C1213 Zn	C1214 As	C1215 Sn	C1216 W	C1217 Co	C1218 Cu	C1219 Cr	C1220 Ni	C1221 Mn	C1222

Annex C
Safety valve certificate



DECLARATION OF CONFORMITY

According to the Norms:
EN10204-2.1 & UNI EN ISO / IEC 17050-1

The undersigned IVR S.p.A.
Producer of Hydrothermal Systems,
based in Boca (NO) Via Brughiera III no.1, Località Piano Rosa (Italy)

DECLARES

Under its sole responsibility that the product

Safety valve F/F
350 - 351 - 355 - 356 series

Are built in accordance with the technical requirements and with the procedures established by the Company Quality Management System compliant with the UNI EN ISO 9001:2015 standard

Field of application:

- Maximum working pressure: 6 bar
- Calibration range:
 - ☐ ½" : 1,5 – 6,0 bar
 - ☐ ¾" : 1,5 – 6,0 bar
 - ☐ 1" : 1,5 – 6,0 bar
- Operating temperature: +5°C / +110°C
- Standard calibration performed by the manufacturer: 6 bar

IVR S.p.A.

Legal Representative

Piero Giacomini

April 20, 2022



Sede Amministrativa: Via Brughiera III n.1 Località Piano Rosa – 28010 BOCA (NO)

Sede Legale: Via Francesco Melzi d'Eril n.7 – 20154 MILANO (MI)

Codice Fiscale e Partita IVA 06829530960 – Registro Imprese di Milano n. 06829530960 – R.E.A. Milano n. 1918135

Tel. 0322 888811 – Fax 0322 888892-93 website www.ivrvalvole.it e-mail vendite@ivrvalvole.it / sales@ivrvalvole.it

Annex D
Certificate of welding electrode

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties



Date:	2021-11-15	Certificate number:	EC26619040 rev. 0
Our order:	0100368940	Your order:	13102021
Our reference:	Predrad Boricic (Serbia)	Your reference:	
Customer number:	HUE00050	Your fax number:	
Customer order date:	20211013	Your e-mail:	
<u>Invoice address</u>	<u>Receiver of certificate</u>	<u>Delivery address</u>	
STANISIC METAL DOO NIS		STANISIC METAL DOO NIS	
KUBANSKA, 31		KUBANSKA, 31	
18000 NIS		18000 NIS	
Serbia		Serbia	
DELIVERY	Lot number:	SFV4510265	Quantity: 7524 KGM
PRODUCT		CHEMICAL COMPOSITION	
Brand:	ESAB	Actual results: acc to EN 10204 - 3.1	
Description:	OK 43.33 4.0x450mm	<u>All weld metal</u>	
Item number:	4333404400	Auxiliary:	
CLASSIFICATIONS		C 0.08%	
SFA/AWS A5.1: E6013		Si 0.35%	
EN ISO 2560-A: E 42 0 RR 12		Mn 0.5%	
		P 0.025%	
		S 0.009%	
		Cr < 0.1%	
		Ni < 0.1%	
		Mo < 0.1%	
		Nb 0.01%	
		Cu < 0.1%	
		V 0.02%	
MECHANICAL PROPERTIES			
Typical data: acc to EN 10204 - 2.2			
Standard:			
Auxiliary:			
Condition:			

COMMENTS

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:
ESAB Kft. 1083 Budapest, Bókey János u. 44-46., C6 épület, 7. emelet +36 1 382-12-00

Validation - Chemical Analysis

Pál Dranka

Quality Assurance Manager

Validation - Others

J-P Emoult

Product Manager

Annex E
Certificate of seal

Извештај о испитивању број 612-22-4/14 страна 1 од укупно 3 стране



УНИВЕРЗИТЕТ У НИШУ
МАШИНСКИ ФАКУЛТЕТ
ЗАВОД ЗА МАШИНСКО ИНЖЕЊЕРСТВО
ЛАБОРАТОРИЈА ЗА ИСПИТИВАЊЕ
МАТЕРИЈАЛА И МАШИНА
18000 Ниш, ул. А. Медведева бр. 14, тел/факс 018/588-199
тел. 018/ 500-739, 500-696, 500-701 – руководиоца Завода
e-mail: zavod@masfak.ni.ac.rs

ИЗВЕШТАЈ О ИСПИТИВАЊУ

бр. 612-22-19/14

ИСПИТИВАЊЕ СТАКЛЕНЕ ПЛЕТЕНИЦЕ

Наручилац:

«MILAN PEŠIĆ» D. O. O.
Производња ужади, канапа, плетеница и мрежа
16203 Вучје, с. Брза

ПОДАЦИ О ПРОИЗВОДУ

Назив производа: СТАКЛЕНА ПЛЕТЕНИЦА
Година производње: 2014.
Попречни пресек: квадратни, правоугаони и огругли од 3 mm 90 mm.
Сировински састав: стаклено предиво.

ТЕХНИЧКЕ КАРАКТЕРИСТИКЕ

Радна температура: до 550 °C
Називни статички притисак: 100 daN/cm² (bar)

Резултати испитивања се односе само на испитане узорке.

Ниш, 27. 2. 2014. год.

Руководилац посла


Горан Раденковић, ван. проф.


Руководилац
Завода за машинско инжењерство

Проф. др Драган Милчић