

CERTIFICATE OF CONSTANCY OF PERFORMANCE

20-CPR-248-(C-4/2007)

In compliance with Government decree no. 275/2013. (issued on 16th July) this certificate applies to the construction product

Weldable, ribbed, hot-rolled reinforcing steel bars in steel quality B500SP (PN-H-93220:2006) / B500C (MSZ/T 339:2012.03) produced by CELSA Huta Ostrowiec

with product performance and intended use shown in the annex as page 2/2 of this certificate and produced by

CELSA Huta Ostrowiec Sp. z. o. o.

27-400 Ostrowiec Swietokrzyski, ul Samsonowicza 2., Poland

and produced in the manufacturing plant:

CELSA Huta Ostrowiec Sp. z. o. o.

27-400 Ostrowiec Swietokrzyski, ul Samsonowicza 2., Poland

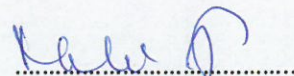
This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in National Technical Assessment no. A-80/2017 dated at 29.11.2017 under system (1+) are applied and that

the product fulfils all the prescribed requirements set out above.

This certificate was first issued on 12.12.2017* and will remain valid as long as the test methods and/or factory production control requirements included in the National Technical Assessment, used to assess the performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly.

This certificate consists of 2 pages!

Dated at Szentendre, on 12th of December 2017



Ágnes Molnár
Head of Certification Office
Certification Office
of ÉMI Non-profit Ltd.

* certificate was issued first on 23.08.2007 within the period of validity of joint Ministerial Decree No. 3/2003. (25th January) BM-GKM-KvVM of Ministry of Interior, Ministry of Economy and Transport, and Ministry of Environment Protection and Water Management.

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ANNEX

Nominal diameter: Ø8; Ø10; Ø12; Ø14; Ø16; Ø20; Ø25; Ø28 and Ø32 mm

Intended use of the product:

The reinforcing steel products may be used as reinforcement of concrete structures according to MSZ EN 10080:2005 in steel quality B500SP (PN-H-93220:2006) and B500C (MSZ/T 339:2012.03) with identical intended use as well as B 60.50 (MSZ 339:1987) hot rolled reinforcing steel.

The reinforcing steel products can be taken into account with the parameters of B 60.50 (MSZ 339:1987) steel by performing diagnostic works on building designed in accordance with withdrawn standards series no. MSZ 15022:1986 and no. MSZ 15022:1986/1M:1992.

The steel bars can be taken into account as product in ductility class C with $R_e \geq 500$ MPa declared yield strength calculated from nominal cross-section at design works and strength calculations, according to Annex C of standard no. MSZ EN 1992-1-1:2010 (EUROCODE 2).

Essential characteristics	Performance	
	B500SP	B500C
Yield or proof strength R_{eH} (MPa) or $R_{p0,2}$ (MPa) ¹⁾	500 – 625 (characteristic)	≥ 500 (characteristic) ≥ 485 (individual)
Tensile strength, R_m (MPa)	-	≥ 600 (characteristic) ≥ 582 (individual)
Stress ratio, R_m / R_{eH}	1,15 – 1,35 (characteristic)	1,15 – 1,35 (characteristic) 1,13 – 1,38 (individual)
Extension, A_{gt} (%)	$\geq 8,0$ (characteristic)	$\geq 7,5$ (characteristic) $\geq 6,75$ (individual)
Elongation, A_5 (%) ²⁾	$\geq 16,0$ (average)	$\geq 18,0$ (average)
Bendability		
- bending test 180 degrees, without crack	-	$d \leq 16$ mm: 3d $d > 16$ mm: 6d
- bending test 90 degrees, re-bending 20 degrees	$d \leq 12$: 5d $12 < d \leq 16$: 6d $16 < d$: 8d	-
Reaction to fire	A1	
Tolerance of production length	+100 / -0 mm	
Tolerance from nominal cross-section / mass per metre (%)	$d \leq 8$ mm: $\pm 6,0$ $d > 8$ mm: $\pm 4,5$	
Bonding strength (f_b), minimum (individual)	$d = 8$ mm: 0,045 $8 \text{ mm} < d \leq 10$ mm: 0,052 $d > 10$ mm: 0,056	$8 \text{ mm} < d \leq 12$ mm: 0,040 $d > 12$ mm: 0,056
Fatigue	$\sigma_{max} = 300$ MPa; $2\sigma_A = 150$ MPa; $n \geq 2 \cdot 10^6$	
Chemical composition (durability), cast analysis C; S; P; N ₂ ; Cu	-	$\leq 0,22$; $\leq 0,050$; $\leq 0,050$; $\leq 0,012$; $\leq 0,80$
Weldability, carbon equivalent value (C_{Ew} , C_{eq}) - cast analysis - product analysis	-	$\leq 0,50$ $\leq 0,52$
Weld metal bend test for 150°, without cracks in the transition zone	-	$d \geq 16$ mm: 3d mandrel
Impact strength on 0 °C-on, KV (J) $d \geq 16$ mm		average ≥ 28 individual value ≥ 21 (75%)

¹⁾ Upper yield strength (R_{eH}), when real yield phenomena occurs, otherwise proof strength ($R_{p0,2}$)

Dated at Szentendre, on 12th of December 2017