

CERTIFICATE OF CONSTANCY OF PERFORMANCE

20–CPR–231–(C-45/2017)

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 B500B (DIN 488-1:2009 / MSZ/T 339:2012.03) with $R_{eH} = 500$ MPa declared yield strength calculated from nominal cross-section produced by KROMAN CELIK SAN. A.S.

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

KROMAN CELIK SAN. A.S.

41700 Kocaeli/Darica, No. 155, EMEK MAH. ASIROGLU CAD. Turkey

and produced in the manufacturing plant:

KROMAN CELIK SAN. A.S.

41700 Kocaeli/Darica, No. 155, EMEK MAH. ASIROGLU CAD. Turkey

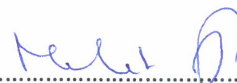
This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in National Technical Assessment no. A-79/2017 dated at 07.09.2017 under system (1+) are applied and that

the product fulfils all the prescribed requirements set out above.

This certificate was first issued on 18.09.2017 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 18th of September 2017



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

CERTIFICATE OF CONSTANCY OF PERFORMANCE 20-CPR-231-(C-45/2017) ANNEX

Nominal diameter:

Ø8, Ø10, Ø12, Ø14, Ø16, Ø18, Ø20, Ø22, Ø25, Ø28, Ø32, Ø36, Ø40 mm

Intended use of the product:

The reinforcing steel bars may be used as reinforcement of concrete structures according to EN 10080:2005, in steel quality B500B (DIN 488-1:2009 and MSZ/T 339:2012.03).

The steel bars can be taken into account with the parameters of B60.50 (MSZ 339:1987) steel by performing diagnostic works on building designed in accordance with withdrawn standards series no.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 products in ductility class "B" with $R_{eH} = 500$ MPa declared yield strength calculated from nominal cross-section at design works and strength calculations, according to Annex C of standard no. EN 1992-1-1:2010 (EUROCODE 2).

Essential characteristics	Performance
Yield or proof strength (R_{eH} or $R_{p0,2}$) ¹⁾	≥ 500 MPa (characteristic) ≥ 485 MPa (individual)
Tensile strength (R_m)	≥ 580 MPa (characteristic) ≥ 563 MPa (individual)
Stress ratio (R_m / R_{eH})	≥ 1.08 (characteristic) ≥ 1.06 (individual)
Yield ratio ($R_{e,act} / R_{e,nom}$)	≤ 1.30 (individual)
Extension (A_{gt})	≥ 5.0 % (characteristic) ≥ 4.5 % (individual)
Elongation (A_5) ²⁾	≥ 18.0 % (average)
Bendability	180 degrees: $d \leq 16$ mm: 3d mandrel $d > 16$ mm: 6d mandrel
Reaction to fire	A1
Tolerances from nominal cross-section	$d \leq 8$ mm: ± 6,0 % $d > 8$ mm: ± 4,5 %
Bonding strength (f_p), minimum (individual)	$8 \text{ mm} \leq d \leq 12 \text{ mm}$: 0,040 $d > 12 \text{ mm}$: 0,056
Fatigue:	$\sigma_{max} = 300 \text{ MPa}$; $2\sigma_A = 150 \text{ MPa}$ $n = 2 \cdot 10^6$
Chemical composition (durability), cast analysis C; S; P; N ₂ ; Cu	≤ 0,22; ≤ 0,050; ≤ 0,050; ≤ 0,012; ≤ 0,80
Weldability	
Carbon equivalent value (C_{EV} , C_{eq}) - cast analysis - product analysis	≤ 0.50 ≤ 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 ($R_{p0,2}$)	
²⁾ Performance of elongation, A_5 (%) can be applied for Ø 8- Ø 36 diameter	

Dated at Szentendre, on 18th of September 2017