

## CERTIFICATE OF CONSTANCY OF PERFORMANCE

20–CPR–232–(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 in coils 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 18<sup>th</sup> of September 2017



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

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### 20–CPR–232–(C-45/2017)

#### ANNEX

**Nominal diameter:**

Ø8, Ø10, Ø12, Ø14 mm

**Intended use of the product:**

The reinforcing steel coils 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 coils 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the parameters of B60.50 (MSZ 339:1987) steel by performing diagnostic works on building designed in accordance with withdrawn standards series no.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 coils 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 $R_{p0,2}$ ) <sup>1)</sup>	≥ 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 ( $A_5$ ) <sup>2)</sup>	≥ 18.0 % (average)
Bendability	180 degrees: 3d 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)	$8$ mm ≤ $d \leq 12$ mm: 0,040 $d > 12$ mm: 0,056
Fatigue:	$\sigma_{max} = 300$ MPa; $2\sigma_A = 150$ MPa $n = 2 \cdot 10^6$
Chemical composition (durability), cast analysis C; S; P; N <sub>2</sub> ; 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
<sup>1)</sup> Upper yield strength ( $R_{eH}$ ), when real yield phenomena occurs, otherwise proof strength ( $R_{p0,2}$ )	
<sup>2)</sup> Performance of elongation, $A_5$ (%) can be applied for Ø 8- Ø 36 diameter	

Dated at Szentendre, on 18<sup>th</sup> of September 2017