

**STANDARD REFERENCE:**

EN 10088-3: 2014 (Hot-rolled and bright products) | EN 10263-5: 2017 (Wire rods, bars and wire for cold heading products)

EN 10272: 2016 (Stainless steel bars for pressure purposes) P.E.D. 2014/68/EU

**RODACCIAI REFERENCES AND COMPARABLE STANDARDS**

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10088-3: 2005 EN 10263-5: 2001 EN 10272: 2007		(UNI 6900: 71)	(DIN 17440 - 85)		(NF A 35-574-90)	(BS 970 pt.3 -91)	AISI
Grade	N°		Werkstoff	N°			
X2CrNiMo17-12-2	1.4404	X 2 CrNiMo 17 12	X2CrNiMo17-12-2	1.4404	Z3 CND 17 - 11 - 02	(316S11)	316L

**CHEMICAL COMPOSITION (CAST ANALYSIS) (%)**

C / max	Si / max	Mn / max	P / max	S / max	N / max	Cr	Mo	Ni
0,030	1,00	2,00	0,045	0,030	0,10	16,5÷18,5	2,00÷2,50	10,0÷13,0

**MECHANICAL PROPERTIES - Rough turned (1X) in the annealed condition**

Size max (mm)	Hardness HB max <sup>**</sup>	Rp <sub>0.2</sub> (MPa) min	Rp <sub>1</sub> (MPa) min <sup>*</sup>	R <sub>m</sub> (MPa) <sup>**</sup>	A <sub>5</sub> (%) min <sup>**</sup>	KV (J) min	Resistance to intergranular corrosion	
							in the delivery condition	in the welded condition
100	215	200	235	500÷700	40	100	YES	YES

\* Only for guidance \*\* The maximum HB values may be raised by 100HB or the tensile strength value may be raised by 200 MPa and the minimum A<sub>5</sub> value may be lowered to 20% for bars of ≤35 mm

**MECHANICAL PROPERTIES - Cold drawn (2H, 2B) and ground bars (2G) in the solution annealed condition**

Size max (mm)	Rp <sub>0.2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min <sup>*</sup>	KV (J) min
≤ 10	400	600÷930	25	-
> 10 ≤ 16	380	580÷930	25	-
> 16 ≤ 40	200	500÷830	30	100
> 40 ≤ 63	200	500÷830	30	100
> 63 ≤ 100	200	500÷700	40	100

\* Values valid only for size ≥5 mm

**MECHANICAL PROPERTIES - Cold drawn wire and coils (2H)**

Tensile strength levels	+C 600	+C 700	+C 800	+C900	+C 1000	+C 1100	+C 1200	+C 1400	+C 1600
R <sub>m</sub> (MPa)	600÷800	700÷900	800÷1000	900÷1100	1000÷1250	1100÷1350	1200÷1450	1400÷1700	1600÷1900

Note: the desired tensile strength level shall be evaluated depending on diameter required



**MECHANICAL PROPERTIES - Cold drawn wire and coils in the solution annealed condition (2D)**

Size	0,10 ≤ d ≤ 0,20	0,20 ≤ d ≤ 0,50	0,50 ≤ d ≤ 1,00	1,00 ≤ d ≤ 3,00	3,00 ≤ d ≤ 5,00	5,00 ≤ d ≤ 16,00
R <sub>m</sub> (MPa) max	1050	1000	950	900	850	800
A (%) min	20	30	30	30	35	35

Note: If skin passed, R<sub>m</sub> might be increased by up to 50 MPa

**MECHANICAL PROPERTIES - Bars, wire and coils for cold heading**

Size mm	As Treated (+AT) or Peeled (+AT+PE)		Cold Drawn (+AT+C)		Cold Drawn + Solution annealed (+AT+C+AT)		Cold Drawn + Solution annealed + Skin passed (+AT+C+AT+LC)	
	R <sub>m</sub> (MPa) max	Z (%) min	R <sub>m</sub> (MPa) max	Z (%) min	R <sub>m</sub> (MPa) max	Z (%) min	R <sub>m</sub> (MPa) max	Z (%) min
≥2 ≤5	-	-	-	-	670	68	720	63
>5 ≤10	650	68	780	-	650	68	700	63
>10 ≤25	650	68	750	-	650	68	-	-
>25 ≤50	650	68	-	-	-	-	-	-

**WORKING TEMPERATURES RECOMMENDED**

Operation	Hot forgings deformation	Solution annealing (water, air)
°C	900÷1200	1000÷1120

