

**STANDARD REFERENCE:**
**EN 10088-3: 2005** (Hot-rolled and bright products)

**RODACCIAI REFERENCES AND COMPARABLE STANDARDS**

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10088-3: 2005		(UNI 6900: 71)	(DIN 17440 - 85)		(NF A 35-574-90)	(BS 1554 - 90)	AISI
Grade	N°		Werkstoff	N°			
X39Cr13	1.4031	X 40 Cr 14	X38Cr13	1.4031	(Z 44 C 14)	420S45	420

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

C	Si / max	Mn / max	P / max	S / max	Cr
0,36÷0,42	1,00	1,00	0,040	0,030	12,5÷14,5

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

Size max (mm)	Heat treatment	Hardness HB max*	Rp <sub>0.2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	KV (J) min
100	Annealed (+A)	245	-	800 max	-	-
	Quenched + Tempered (+QT 800)	-	650	800÷1000	10	12

\* only for guidance

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

Size max (mm)	Annealed		Quenched + Tempered				
	R <sub>m</sub> (MPa) max	HB max*	Heat treatment	Rp <sub>0.2</sub> (MPa) min	R <sub>m</sub> (MPa) max	A <sub>5</sub> (%) min**	KV (J) min
≤ 10	950	305	Quenched + Tempered (+QT800)	700	850÷1100	7	-
> 10 ≤ 16	950	305		700	850÷1100	7	-
> 16 ≤ 40	900	280		650	800÷1050	8	12
> 40 ≤ 63	840	260		650	800÷1000	8	12
> 63 ≤ 100	800	245		650	800÷1000	10	12

\* for reference only \*\* values valid only for size ≥ 5 mm

**WORKING TEMPERATURES RECOMMENDED**

Operation	Hot forgings deformation	Annealing (air)	Quenching (air, oil)	Tempering (QT 800)
°C	900÷1100	750÷850	950÷1050	650÷700

## TEMPERING CURVE

