CHRONIFER®
Labor 13 %
martensitic
Stainless Steel

Material No.	DIN Abbreviation	AFNOR	AISI/SAE/ASTM	ISO	Euro Standard EN	Others
~ 1.4005 Condition A	X12CrS13	X12CrS13 (former Z 11 CF 13)	AISI ~ 416	X12CrS13	X12CrS13	JIS ~ SUS 416

Distinctive feature & main attribute: a rather non-corroding, free cutting chromium steel, excelled by a fine machinability due to a high sulphur content. Its resistance to water and steam is achieved by tempering, hardening and quenching. Condition T above 3 mm in bars (26 – 32 HRC) can be tempered because of its low carbon content unless the final part has been polished properly (without pores).

Use & application range: this material is deployed in screws, nuts and bolts as well as food industry and installations.

REFERENCE ANALYSIS %	C	Si	Mn	P	S	Cr	Mo	Fe
	0.08 0.15	max. 1.00	max. 1.50	max. 0.04	max. 0.035	12.00 14.00	max. 0.60	balance

EXECUTION DELIVERY FORM STANDARD SIZES AVAILABILITY	• Execution in 3 m round bars as well as in coils • Standard size in stock: see Product range • Other sizes on request
TOLERANCES	• Ø < 2.00 mm, cold drawn, polished; ISO h8 • Ø ≥ 2.00 mm, cold drawn, ground, polished; ISO h8 • Tighter tolerances (up to +/- 0.002 mm) on request
MECHANICAL PROPERTIES	At delivery status: • Tensile strength *(R_m)*: 880 – 990 MPa (26 – 32 HRC), size depending • Hardness after tempering: ~ 38 – 42 HRC
HEAT TREATMENT	Precipitation hardening after tempering in oil (with the carbon content on lower limit): • Tempering in oil: 950 – 1000 °C • Soft annealing: 750 – 800 °C, cooling in the air during 2 – 4 hours results in a R_m of 490 – 690 MPa/mm²
CUTTING RATES	v_c ~ 45 – 60 m/min, short-chipping, value depending on the lubrication oil, cutting tools and shape of parts. • Cutting oil: e.g. INOX of Motorex

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