



CHRONIFER® M-15 martensitic Hardenable Stainless Steel

Material No.	DIN Abbreviation	AFNOR	AISI/SAE/ASTM	ISO	Euro Standard EN	Others
1.4057	X17CrNi16-2 (X20CrNi17-2)	X17CrNi16-2 (former Z 15 C Ni 16.02)	AISI ~ 431 ASTM F899	X17CrNi16-2	X17CrNi16-2 (X21CrNi17)	NF S 94-090 JIS ~ SUS 431

Distinctive feature & main attribute: a steel with high polishability, precedingly refined by an electro-slag remelting process (ESR), combining excellent impact strength and high hardness levels. The corrosion resistance can only be achieved by tempering the parts. For a greater achievement, the parts must be well polished. Due to its low sulphur and carbon content and some nickel, this quality is even better non-corrosive than 1.4034 or 1.4035. It is resistive in atmospherical conditions and in seawater and strong oxidizing acids.

Use & application range: this material meets the requirement of construction parts of highest strenght such as surgery equipments of medical or dental industries. Other typical areas are piston rods, stirrers, armatures, shaffing, spindels, pump or valve parts, bolts and nuts.

REFERENCE ANALYSIS %	C	Si	Mn	P	S	Cr	Ni	Fe
	0.12 0.22	max. 1.00	max. 1.00	max. 0.04	max. 0.03	15.00 17.00	1.50 2.50	balance

EXECUTION DELIVERY FORM STANDARD SIZES AVAILABILITY	<ul style="list-style-type: none"> Execution in 3 m round bars Standard size in stock: see Product range Other sizes on request
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TOLERANCES	<ul style="list-style-type: none"> High precision cold drawn, ground, polished; ISO h7; surface finish Ra 0.4 (N5) Tighter tolerances on request
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MECHANICAL & ELECTRICAL PROPERTIES	At delivery status: <ul style="list-style-type: none"> Tensile strength (R_m): ~ 850 MPa, size depending Hardness after tempering: ~ 47 HRC Electrical resistivity (R) at 20 °C: 0.70 Ω mm²/m
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HEAT TREATMENT	<ul style="list-style-type: none"> Tempering: 950 – 1050 °C, cooling in water Annealing: 600 – 800 °C (See chart)
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CUTTING RATES	$v_c \sim 30 - 40$ m/min , long-chipping, value depending on the lubrication oil, cutting tools and shape of parts. <ul style="list-style-type: none"> Cutting oil: e.g. INOX or ORTHO NFX of Motorex
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Modifications will not be adjusted automatically

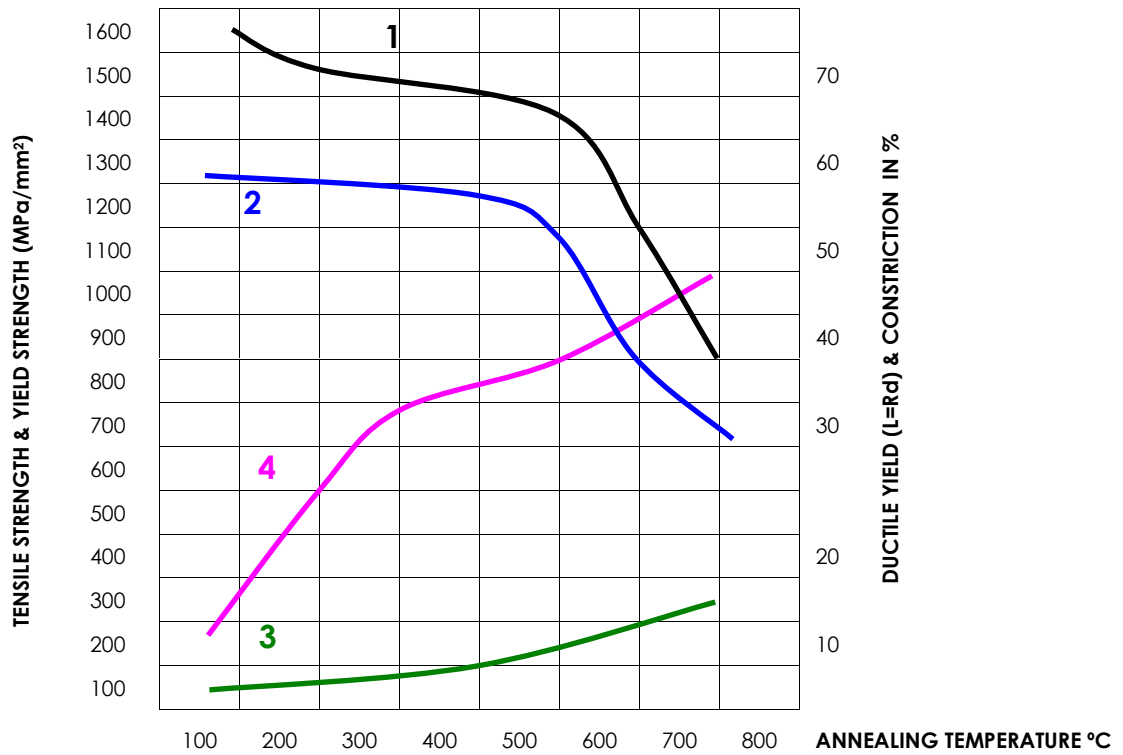
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CHART



- 1: Tensile strength R_m (MPa)
- 2: Yield strength $R_e 0.2$ (mm²)
- 3: Ductile yield $A \epsilon$ (%)
- 4: Constriction Z (%)

The above curves indicate the results of determinate section of a curtain size of 5 mm. The result after heat treatment can be slightly different than shown on this curve, depending on the shape and size of the part.

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