

L. KLEIN SA

ACIERS FINS ET MÉTAUX

EDELSTÄHLE UND METALLE

FINE STEEL AND METALS



CHRONIFER M-4021

martensitic

Hardenable Stainless Steel



Material No.	DIN Abbreviation	AFNOR	AISI/SAE/ASTM	ISO	Euro Standards	Others
1.4021	X20Cr13	X20Cr13 (ancien Z 20 C 13)	420		X20Cr13	SUS 420J1

Distinctive feature and main attribute: a rustproof, temperable stainless chromium steel alloy whose corrosion resistance can only be achieved by tempering its parts. For a greater achievement, the parts must be well polished. Due to its low sulphur and carbon content, this quality is even better non-corroding than 1.4034 or 1.4035.

Use and application range: this material is suitable not only for medical and dental technologies such as tweezers and forceps but turbine blades, axes, shafts, pump components, ship's propellers, spindels and poppets.

CHEMICAL COMPOSITION IN VOLUME PERCENTAGE	C	Si	Mn	P	S	Cr	Fe
	0.16 0.25	max. 1.00	max. 1.50	max. 0.04	max. 0.03	12.00 14.00	balance

EXECUTION DELIVERY FORM STANDARD SIZES AVAILABILITY	<ul style="list-style-type: none">• Execution in 3 m (2 m) round bars as well as in coils• Stock range right now of \varnothing 1.00 – 16.00 mm• Other sizes on request
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TOLERANCES	<ul style="list-style-type: none">• $\varnothing < 2.00$ mm, cold drawn, ground, polished; ISO h8; surface finish Ra 0.4 (N5)• $\varnothing \geq 2.00$ mm; ISO h7 (h6)• Tighter tolerances on request
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MECHANICAL & ELECTRICAL PROPERTIES	At delivery status: <ul style="list-style-type: none">• Tensile strength (R_m): 700 – 950 MPa• 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 oil• Soft annealing: 745 – 825 °C (See chart)
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CUTTING RATES	<ul style="list-style-type: none">• $v_c \sim$ 25 – 40 m/min, long-chipping, value depending on the lubrication oil, cutting tools and shape of parts.• Cutting oil: e.g. INOX or ORTHO of Motorex
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Modifications will not be adjusted automatically

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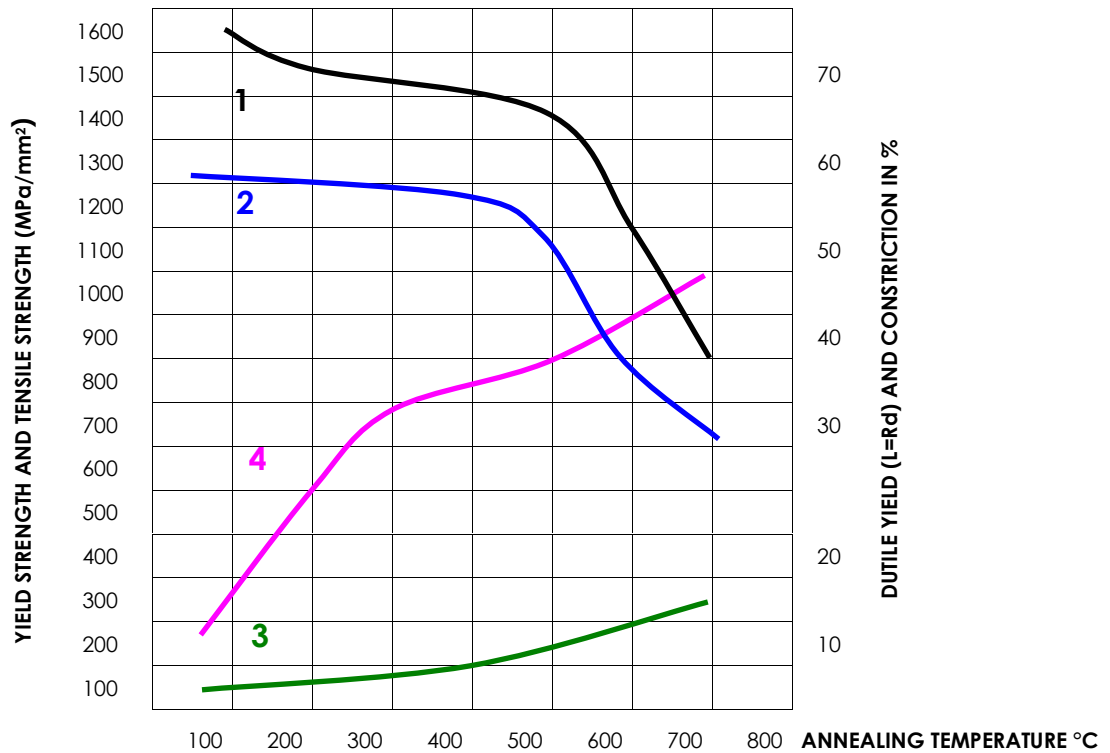
CHRONIFER

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CHART OF TREATMENT

TENSILE STRENGTH MPA



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

If you harden in oil, we recommend to not pass over the annealing temperature of 820 °C to avoid cracks. The water should be pre-heated at about 50 °C. 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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