



## CHRONIFER® Labor M-13 martensitic Hardenable Stainless Steel

Material No.	DIN Abbreviation	AFNOR	AISI/SAE/ASTM	ISO	Euro Standard EN	Others
1.4035 (1.4034+S)	X46CrS13 (X45CrS13Mo) (former X 45 CrS 13)	X45CrS13 (former Z 44 CF 14)	AISI ~ 420F (AISI 420C+S)		X46CrS13	JIS ~ SUS 420F

Distinctive feature & main attribute: a temperable chromium steel (martensite added with sulphur), excelled by its ease of machining and good corrosion resistance to water and steam unless the final part has been polished properly (without pores). There is no difference due to abrasion of the parts after tempering between 1.4035 (with sulphur) or 1.4034 (without sulphur).

Use & application range: this material is preferentially designed for medical instruments such as microsurgery and dental medicine but also for other industries just as nozzle screws, working plates, stamping and punching, jigs and tools, extractors, guides, stoppers and rollers.

REFERENCE ANALYSIS %	C	Si	Mn	P	S	Cr	Mo	Ni	Fe
	<b>0.43</b> <b>0.50</b>	<b>max.</b> <b>1.00</b>	<b>max.</b> <b>1.00</b>	<b>max.</b> <b>0.04</b>	<b>0.15</b> <b>0.35</b>	<b>12.50</b> <b>14.00</b>	<b>0.40</b> <b>0.60</b>	<b>max.</b> <b>0.50</b>	balance

<b>EXECUTION DELIVERY FORM STANDARD SIZES AVAILABILITY</b>	<ul style="list-style-type: none"> <li>Execution in 3 m (2 m) round bars as well as in coils for Escomatic</li> <li>Standard size in stock: see <a href="#">Product range</a></li> <li>Other sizes on request</li> </ul>
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<b>TOLERANCES</b>	<ul style="list-style-type: none"> <li>∅ &lt; 2.00 mm, cold drawn, polished; ISO <b>h8</b></li> <li>∅ ≥ 2.00 mm, cold drawn, ground, polished; ISO <b>h7</b>; surface finish Ra 0.4 (N5)</li> <li>Tighter tolerances on request</li> </ul>
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<b>MECHANICAL PROPERTIES</b>	At delivery status: <ul style="list-style-type: none"> <li>Tensile strength (<math>R_m</math>): <b>~ 850 MPa</b>, size depending</li> <li>Hardness after tempering: <b>~ 55 HRC</b></li> </ul>
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<b>HEAT TREATMENT</b>	<ul style="list-style-type: none"> <li>Tempering: 1000 – 1050 °C, cooling in water</li> <li>Soft annealing: 750 – 800 °C</li> </ul> (Annealing as required see chart)
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<b>CUTTING RATES</b>	<ul style="list-style-type: none"> <li><math>v_c</math> ~ <b>40 – 55 m/min</b>, short-chipping, value depending on the lubrication oil, cutting tools and shape of parts.</li> <li>Cutting oil: e.g. INOX of Motorex</li> </ul>
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Modifications will not be adjusted automatically

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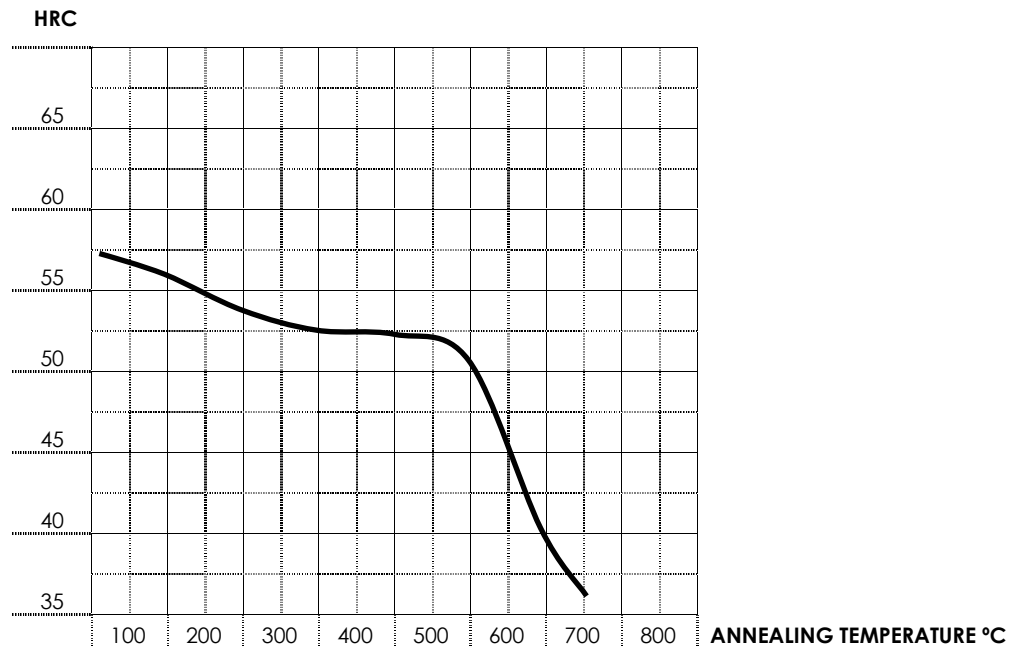
# CHRONIFER®

Labor M-13

1.4035

(1.4034+S)

## ANNEALING CURVE



The above curve indicates the results of determinate section of a curtain size of 5.50 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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