

TOOL STEELS

HARDENABLE CORROSION RESISTANT STEEL

Product Description

Martensitic chromium steel with high carbon and molybdenum addition.

Properties

- > Toughness & Ductility: good
- > Wear Resistance: very high
- > Machinability: good
- > Dimensional stability: good
- > Polishability: good
- > Corrosion resistance: good

Applications

- > Injection Molding
- > Pharmaceutical industry like pill punches and -dies
- > Extrusion screws for plastic processing
- > Foodindustry like extrusion screws, can closing rolls
- > Hotrunner systems
- > Standard Parts (Molds, Plates, Pins, Punches)

Technical data

Material designation	
1.4125	SEL
X105CrMo17	EN
440C	AISI

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo
1.05	0.4	0.4	16.7	0.5

Material characteristics

	Corrosion resistance	Machinability in as supplied condition	Polishability	Toughness	Wear resistance
BÖHLER M340 ISOPLAST®	★★★	★★★	★★	★★	★★★
BÖHLER M368 MICROCLEAN®	★★★★	★★★	★★★★	★★★★	★★★★
BÖHLER M380 ISOPLAST®	★★★★★	★★★★★	★★★★★	★★★★★	★★★★
BÖHLER N685	★★	★	★	★	★★★★
BÖHLER N690	★	★	★	★	★★★★
BÖHLER N695	★	★	★	★	★★★★
BÖHLER M390 MICROCLEAN®	★★	★	★★★	★★	★★★★

General ranking and differentiation is valid only for the materials shown in the table. Ranking may not be transferred if other materials are to be considered comparatively
 Ranking on corrosion resistance based upon immersion test 24 hrs in 20% boiling acetic acid in hardened & tempered condition
 Ranking on polishability based upon comparative tests performed and evaluated by joke Technologies Germany

Delivery condition

Annealed

Hardness (HB)	max. 265
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Heat treatment

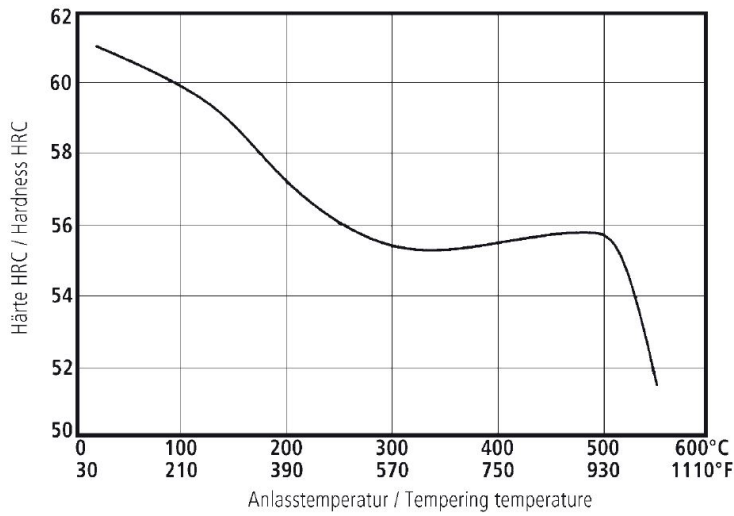
Stress relieving

Temperature	650 °C 1202 °F	After through heating, keep at temperature for 1 to 2 hours in a neutral atmosphere. Slow furnace cooling
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Hardening and Tempering

Temperature	1000 to 1050 °C 1832 to 1922 °F	Oil, N2 - holding time after complete soaking, max. 30 minutes / 25 mm cross section
Temperature	150 to 350 °C 302 to 662 °F	Tempering treatment required after hardening to the desired working hardness - see tempering chart. Tempering immediately after hardening and quenching to room temperature of min. 2h after complete soaking. Note: Tempering temperatures above 400°C are reducing corrosion resistance and toughness.

Tempering chart



Hardening temperature: 1030°C / 1886°F
Specimen size: square 20 mm

Hardness up to 58 - 60 HRC

Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.7 0.28
Thermal conductivity (W/(m.K) BTU (IT) ft/hr/ft ² /F)	15 8.67
Specific heat (J/(kg.K) BTU (IT) lb/F)	430 102.7
Spec. electrical resistance (Ohm.mm ² /m 10 ⁻⁴ Ohm.inch ² /ft)	0.8 3.78
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	215 31.18

Thermal Expansions between 20°C | 68°F and ...

Temperature (°C °F)	100 212	200 392	300 572	400 752	500 932
Thermal expansion (10 ⁻⁶ m/(m.K) 10 ⁻⁶ inch/(inch.F))	10.4 5.8	10.8 6	11.2 6.2	11.6 6.4	11.9 6.6

For more information see <https://www.voestalpine.com/bohler-edelstahl/de/>

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