BÖHLER

BÖHLER M310
ISOPLAST

HARDENABLE CORROSION RESISTANT STEELS

Available Product Shapes

Long Products | Plates

Product Description

Advanced martensitic stainless chromium steel for plastic molds. By electroslag remelting and optimization of the chemical composition, BÖHLER M310 ISOPLAST offers many advantages.

Properties

- Good toughness & ductility
- Good wear resistance
- Very good machinabilty
- Very good dimensional stability
- Good polishability
- High corrosion resistance
- High micro-cleanliness

Applications

- Comps. for Food processing and Animal Feed
- Plastic Extrusion
- Consumer Goods - General
- Medical
- Components for Displays
- Hotrunner systems
- Food processing Industry
- Standard Parts (Molds, Plates, Pins, Punches)
- General Components for Mechanical Engineering
- Packaging
- Electronic Industry
- Injection Molding
- Blow Molding
- Lamps/Lenses for Automotive
- Camera lenses
- Screws and Barrels

Technical data

Material designation	
~1.2083	SEL
~SUS420J2	JIS
X40Cr13	EN
X40Cr14	EN
~420	AISI

Standards	
4957	EN ISO
A681	ASTM
AFNOR Z40C14	Others

Chemical composition (wt. %)

C	Si	Mn	Cr	V
0.38	0.7	0.45	14.3	0.2

Material characteristics

	Corrosion resistance	Machinability in as supplied condition	Polishability	Toughness	Wear resistance
BÖHLER M310 ISOPLAST	★★★★	★★★★	★★	★★	★★
BÖHLER M333 ISOPLAST	★★★★★	★★★★	★★★★★	★★★★★	★★
BÖHLER M340 ISOPLAST	★★★	★★★	★★	★★	★★★
BÖHLER M368 MICROCLEAN	★★★★	★★★	★★★★	★★★	★★★
BÖHLER M390 MICROCLEAN	★★	★	★★★	★★	★★★★
BÖHLER M398 MICROCLEAN	★★	★	★★★	★★	★★★★★

Delivery condition

Soft annealed

Hardness	max. 225 HB

Heat treatment

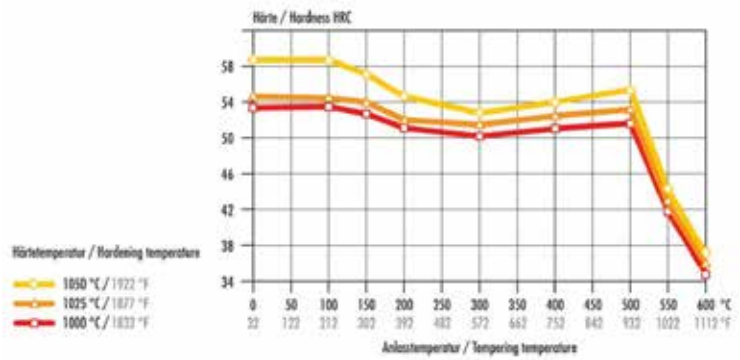
Hardening and Tempering

Temperature (°C | °F)	1000 | 1832 to 1050 | 1922	After through heating, hold for 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart.

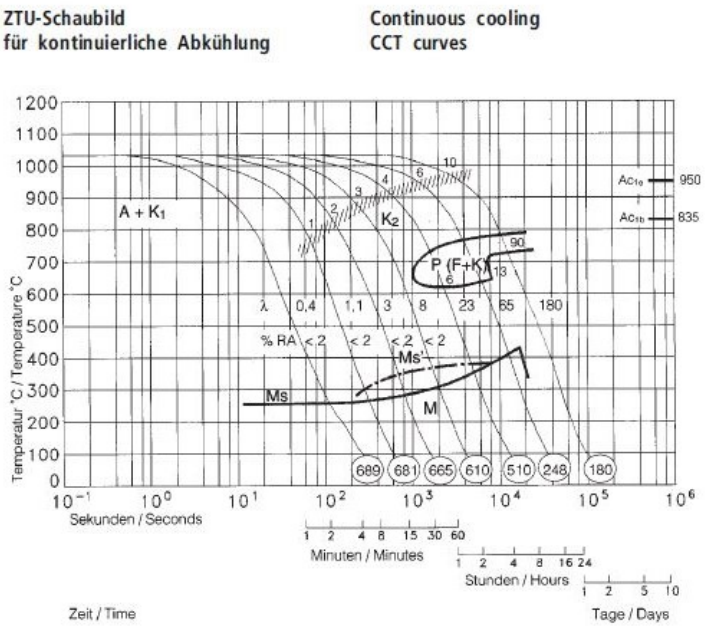
Stress relieving

Temperature (°C | °F)		50°C / 90°F below last tempering temperature.

Tempering Chart



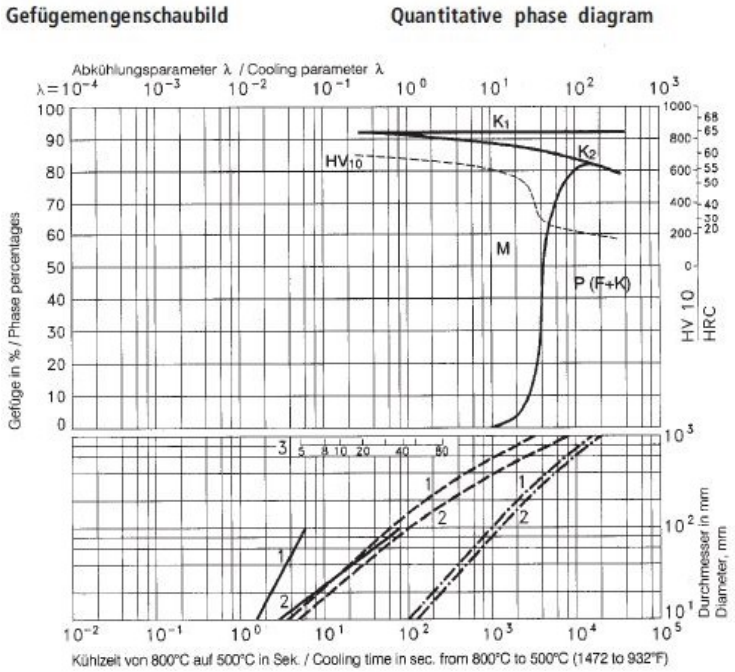
Continuous cooling CCT curves



Austenitising temperature: 1025°C (1877°F)
Holding time: 30 minutes

O Vickers hardness
1...90 phase percentages
0.4...180 cooling parameter, i.e. duration of cooling from 800-500°C (1472-932°F) in s x 10^{-2}
K_1... carbides not dissolved during austenitization (8%)
K_2... carbides newly formed during cooling
Ms-Ms'... range of grain boundry martensite formation

Quantitative phase diagram



A... Austenite
F... Ferrite
K... Carbide
M... Martensite
P... Pearlite

——— Water cooling
- - - - - - Oil cooling
- • - Air cooling

1... Edge or face
2... Core
3... Jominy test: distance from the face end

Physical Properties

Temperature (°C | °F)	20 | 68
Density (kg/dm^3 | lb/in^3)	7.68 | 0.28
Thermal conductivity (W/(m.K) | BTU (IT) ft/hr/ft^2/F)	19.5 | 11.27
Specific heat (J/(kg.K) | BTU (IT) lb/F)	460 | 109.87
Spec. electrical resistance (Ohm.mm^2/m | 10^{-4} Ohm.inch^2/ft)	0.65 | 3.07
Modulus of elasticity (10^{3}N/mm^2 | 10^{3}ksi)	217 | 31.47

Thermal Expansions

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))	10.63 | 5.906	10.94 | 6.078	11.29 | 6.272	11.66 | 6.478	12 | 6.667

For more information see www.voestalpine.com/bohler-edelstahl