PLASTIC MOULD STEELS

HARDENABLE CORROSION RESISTANT STEEL

Application Segments

Plastic Mould

Available Product Variants

Long Products* | Plates

* Presented data refer exclusivly to long products. Please observe the detailed explanations at the end of the data sheet (pdf).

Product Description

BÖHLER M310 ISOPLAST is a corrosion-resistant, martensitic chromium steel which, through electroslag remelting and optimization of the chemical composition, has a good homogeneity and a balanced hardness-toughness-corrosion resistance ratio.

Process Melting

Airmelted + Remelted

Properties

- Toughness & Ductility : good
- Wear Resistance : good
- English (United Kingdom) : very high
- Dimensional stability : very high
- Polishability : good
- Corrosion resistance : high
- Micro-cleanliness : high

Applications

- Components for food processing and animal feed
- Standard Parts (Molds, Plates, Pins, Punches)
- General Components for Mechanical Engineering
- Packaging industry
- Electronic industry
- Glasfibre reinforced plastics
- Injection Molding
- Blow Molding
- Lamps/Lenses for Automotive
- Camera lenses
- Screws and Barrels
- Plastic Extrusion
- Consumer Goods - General
- Medical
- Components for Displays
- Hotrunner systems

Technical data

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

Standards	
4957	EN ISO
AFNOR Z40C14	Others

Chemical composition (wt. %)

C	Si	Mn	Cr	V
0.38	0.7	0.45	14.3	0.2

Delivery condition

Soft annealed	
Hardness (HB)	max. 225

Heat treatment

Stress relieving		
Temperature		Hardened and tempered material: The temperature for stress relief annealing should be approx. 50°C [122 °F] below the previously selected tempering temperature. Other procedure as for stress relief annealing of soft annealed material.

Hardening and Tempering		
Temperature	1,025 to 1,050 °C	For hardening, hold the material at the specified temperature for 15-30 minutes after complete heating and quench quickly. Cool the material to approx. 30°C [86 °F]. Immediately afterwards, the material can be deep-frozen for 2 hours (at -80°C [- 112 °F]) for residual austenite transformation. Tempering should also be carried out immediately.
Temperature	250 to 350 °C	Tempering treatment: For maximum corrosion resistance, temper the material once for 1 hour/ 20 mm material thickness, but for at least 2 hours. Achievable hardness - see tempering diagram.
Temperature	490 to 520 °C	Tempering treatment: For optimum toughness and hardness values (without sub-zero cooling), temper the material twice for 1 hour/20 mm material thickness, but for at least 2 hours. After each heat treatment step, cool the material to approx. 30°C [86 °F]. Achievable hardness - see tempering diagram.
Temperature	480 to 510 °C	Tempering treatment: For optimum toughness and hardness values (with sub-zero cooling), temper the material twice for 1 hour/20 mm material thickness, but for at least 2 hours. After each heat treatment step, cool the material to approx. 30°C [86 °F]. Achievable hardness - see tempering diagram.

Physical Properties

Temperature (°C)	20
Density (kg/dm^3)	7.68
Thermal conductivity (W/(m.K))	19.5
Specific heat (kJ/kg K)	0.46
Spec. electrical resistance (Ohm.mm^2/m)	0.65
Modulus of elasticity (10^{3}N/mm^2)	217

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

Temperature (°C)	100	200	300	400	500
Thermal expansion (10^{-6} m/(m.K))	10.6	10.9	11.3	11.7	12

If other available product variants are listed in addition to long products, please note that these may differ in terms of melting process, technical data, delivery and surface condition as well as available product dimensions. For mandatory technical specifications, other requirements and dimensions, please contact our regional voestalpine BÖHLER sales companies. The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

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