

PLASTIC MOULD STEELS

HARDENABLE CORROSION RESISTANT STEEL

Application Segments

Plastic Mould

Available Product Variants

Long Products*

Plates

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

Product Description

BÖHLER M333 ISOPLAST is a corrosion-resistant, martensitic plastic mold steel with excellent polishability and toughness for products with highest surface requirements. BÖHLER M333 ISOPLAST is also approved for food and beverage contact.

Process Melting

Airmelted + Remelted

Properties

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

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	Ni	V	N
0.24	0.2	0.35	13.25	+	+	+	+

Delivery condition

Soft annealed	
Hardness (HB)	max. 220

Heat treatment

Stress relieving		
Temperature	max. 650 °C	Soft annealed material: For stress relief annealing after mechanical machining, hold the material at temperature in a neutral atmosphere for 1-2 hours after complete heating, then slowly cool in the furnace at 20°C [68 °F]/hour to 200°C [392 °F], then cool in air.
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	max. 980 °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	500 to 510 °C	Tempering treatment: For optimum toughness and hardness values (without sub-zero cooling), temper the material 3 times for 1 hour/20 mm material thickness, but at least 2 hours. After each heat treatment step, cool the material to approx. 30°C [86 °F]. Achievable hardness - see tempering diagram.
Temperature	500 to 520 °C	Tempering treatment: For optimum toughness and hardness values (with sub-zero cooling), temper the material 3 times for 1 hour/20 mm material thickness, but 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)	7.7
Thermal conductivity (W/(m.K))	22.9
Specific heat (kJ/kg K)	0.46
Spec. electrical resistance (Ohm.mm ² /m)	-
Modulus of elasticity (10 ³ N/mm ²)	216

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

Temperature (°C)	100	200	300	400	500
Thermal expansion (10 ⁻⁶ m/(m.K))	10.5	11	11	11.5	12

Long Products: For additional specifications and technical requirements, please contact our regional voestalpine BÖHLER sales companies.

Sheet & Plates: Product Variant may differ in terms of melting process, technical data, delivery, and surface condition as well as available product dimensions. Please contact voestalpine BÖHLER Bleche GmbH & Co KG.

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