

PLASTIC MOULD STEELS

HARDENABLE CORROSION RESISTANT STEEL

Available Product Variants

Long Products

Plates

Product Description

BÖHLER M398 MICROCLEAN is a martensitic chromium steel produced with powder metallurgy. Due to its alloying concept this steel offers extremely high wear resistance and high corrosion resistance – the perfect combination for highly wear-resistant tools.

Process Melting

Powder metallurgy

Properties

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

Applications

- > Comps. for Food processing and Animal Feed
- > Shearing / Machine Knives
- > Food processing Industry
- > Plastic Extrusion
- > Injection Molding
- > Custom Hand Knives
- > Medical
- > Powder Pressing
- > Screws and Barrels
- > Electronic Industry
- > Packaging

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	W
2.7	0.5	0.5	20	1	7.2	0.7

Delivery condition

Soft annealed

Hardness (HB) max. 330

Heat treatment

Stress relieving

Temperature	650 °C 1,202 °F	After through-heating, soak for 4 hours in a neutral atmosphere. Furnace cooling down to 300 °C (570 °F), followed by air. After hardening and tempering, stress relieving has to be performed 50°C (90°F) below last tempering temperature.
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Hardening and Tempering

Temperature	1,120 to 1,180 °C 2,048 to 2,156 °F	For hardening hold at temperature for 20 to 30 min (for hardening temperature 1180°C/ 2156°F 5-10 min). An optional sub-zero treatment at -80°C/-112°F can be applied after hardening. For highest corrosion resistance, temper once for a minimum of 2h at 200-300°C/ 392-572°F. For best wear resistance, temper twice for a minimum of 2h at 540-560°C/ 1004-1040°F (without sub-zero treatment) or 510-530°C/950-986°F (with sub-zero treatment). After each heat treatment step, material should be cooled down to approx. 30°C!
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Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.46 0.27
Thermal conductivity (W/(m.K) BTU/ft h °F)	15.2 8.78
Specific heat (kJ/kg K BTU/lb °F)	0.49 0.117
Spec. electrical resistance (Ohm.mm ² /m 10 ⁻⁴ Ohm.inch ² /ft)	-
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	231 33.5

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	10.6 5.9	10.9 6.1	11.2 6.2	11.5 6.4

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.