

HOT WORK TOOL STEELS

Product Description

Vacuum remelted hot work tool steel with high temper resistance and therefore maximum resistance to heat checking.

Process Melting

Airmelted + VAR

Properties

- > Toughness & Ductility: high
- > Wear Resistance: high
- > Machinability: good
- > Hot Hardness (red hardness): high
- > Polishability: very high
- > Thermal conductivity: very high
- > Micro-cleanliness: very high

Applications

- > Extrusion
- > Gravity / Low Pressure Die-Casting
- > Press Hardening / Hot Stamping
- > Forging (Hot / Semi-hot)
- > High Pressure Die-Casting
- > Progressive Forging (Hatebur)
- > General Components for Mechanical Engineering
- > Injection Molding
- > Mechanical Engineering

Technical data

Material designation		Standards	
~1.2367	SEL	#207	NADCA
~X38CrMoV5-3	EN		
C1885	NADCA		

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V
0.38	0.2	0.25	5	2.8	0.65

Material characteristics

	High temperature strength	High temperature toughness	High temperature wear resistance	Machinability
BÖHLER W403 VMR®	★★★★	★★★★	★★★★	★★★★
BÖHLER W300 ISOBLOC®	★★	★★★★	★★	★★★★★
BÖHLER W300 ISODISC®	★★	★★★	★★	★★★★★
BÖHLER W302 ISOBLOC®	★★★	★★★★	★★★	★★★★★
BÖHLER W302 ISODISC®	★★★	★★★	★★★	★★★★★
BÖHLER W303 ISODISC®	★★★★	★★★	★★★★	★★★★★
BÖHLER W350 ISOBLOC®	★★★	★★★★★	★★★	★★★★★
BÖHLER W360 ISOBLOC®	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER W400 VMR®	★★	★★★★★	★★	★★★★

Delivery condition

Annealed

Hardness (HB)	max. 205
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Heat treatment

Annealing

Temperature	800 to 850 °C 1472 to 1562 °F	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (50 to 68 °F/hr) down to approx. 600 °C (1110 °F), further cooling in air.
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Stress relieving

Temperature	600 to 650 °C 1112 to 1202 °F	Slow cooling in furnace. To relieve stress caused by extensive machining, or for complex shapes. Soak for 1 - 2 hours after temperature equalization (in neutral atmosphere).
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Hardening and Tempering

Temperature	1020 to 1030 °C 1868 to 1886 °F	Oil, salt bath (500 - 550 °C [930 - 1020 °F]), air or vacuum with gas quenching. Holding time after temperature equalization: 15 to 30 minutes. In order to prevent coarsening of the grain, hardening must be carried out at the recommended temperature of 1020 - 1030 °C (1870 - 1885 °F). After hardening, tempering to the desired working hardness, see tempering chart.
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Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.85 0.28
Thermal conductivity (W/(m.K) BTU (IT) ft/hr/ft ² /F)	29.8 17.22
Specific heat (J/(kg.K) BTU (IT) lb/F)	470 112.26
Spec. electrical resistance (Ohm.mm ² /m 10 ⁻⁴ Ohm.inch ² /ft)	-
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	211 30.66

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

Temperature (°C °F)	100 212	200 392	300 572	400 752	500 932	600 1112
Thermal expansion (10 ⁻⁶ m/(m.K) 10 ⁻⁶ inch/(inch.F))	10.63 5.9	10.83 6	12 6.7	12.92 7.2	14.13 7.9	14.34 8

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

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.