BÖHLER

BÖHLER W360
ISOBLOC®

HOT WORK TOOL STEELS

Available Product Shapes

Flat Bar | Ground Flat | Long Products | Open Die Forgings | Plates

Round Bar | Round Ground Bar

Product Description

Hot work tool steel with high hardness, specially developed for use in warm forging applications or for forging dies.
BÖHLER W360 ISOBLOC has a significantly higher toughness than 1.2367 ESR – at a higher hardness.

Properties

- High toughness & ductility
- Very high wear resistance
- Very good machinability
- Very high hot hardness
- Very good polishability
- Very high thermal conductivity
- High micro-cleanliness
- High resistance to fire cracking
- Excellent homogeneity and isotropy
- Coatable
- Lowest levels of unwanted trace elements
- Can be nitrated
- Very high thermal stability

Applications

- Coining
- Forging (Hot / Semi-hot)
- High Pressure Die-Casting
- Progressive Forging (Hatebur)
- Mechanical Engineering / Machine Building General
- Fasteners, Bolts, Nuts
- Powder Pressing
- Standard Parts (Molds, Plates, Pins, Punches)
- Extrusion
- General Components for Mechanical Engineering
- Injection Molding
- Rolling
- Automotive Racing
- Forging Applications
- Rolls
- Pill punching dies
- Fine Blanking, Stamping, Blanking
- Gravity / Low Pressure Die-Casting
- Press Hardening / Hot Stamping
- Shearing / Machine Knives
- Cold Forming
- Machine knife (for producers)
- Screws and Barrels

Technical data

Material designation	
BÖHLER patent	Market grade

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V
0.5	0.2	0.25	4.5	3	0.6

Material characteristics

	High temperature strength	High temperature toughness	High temperature wear resistance	Machinability
BÖHLER W360 ISOBLOC	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER W300 ISOBLOC	★★	★★★★	★★	★★★★★
BÖHLER W300 ISODISC	★★	★★★	★★	★★★★★
BÖHLER W302 ISOBLOC	★★★	★★★★	★★★	★★★★★
BÖHLER W302 ISODISC	★★★	★★★	★★★	★★★★★
BÖHLER W303 ISODISC	★★★★	★★★	★★★★	★★★★★
BÖHLER W320 ISODISC	★★★	★★	★★★	★★★★★
BÖHLER W350 ISOBLOC	★★★	★★★★★	★★★	★★★★★
BÖHLER W400 VMR	★★	★★★★★	★★	★★★★
BÖHLER W403 VMR	★★★★	★★★★	★★★★	★★★★

Delivery condition

Annealed

Hardness	max. 205 HB

Heat treatment

Annealing

Temperature (°C | °F)	750 | 1382 to 800 | 1472	Holding time 6 to 8 hours. Slow, controlled cooling in furnace at a rate of 10 to 20 °C/h (50 to 68 °F/h) down to approx. 600 °C (1100°F), further cooling in air.

Stress relieving

Temperature (°C | °F)	650 | 1202 to 700 | 1292	After through-heating, soak for 1 to 2 hours in a neutral atmosphere. Cool slowly in furnace.

Hardening and Tempering

Temperature (°C | °F)	1050 | 1922	1050 °C (1920 °F)/oil, salt bath 500 bis 550 °C (930 to 1020 °F), air, vacuum furnace with gas quenching Holding time after through-heating: 15 to 30 minutes After hardening, tempering to the desired working hardness, see tempering chart.

Physical Properties

Temperature (°C | °F)	20 | 68
Density (kg/dm^3 | lb/in^3)	7.81 | 0.28
Thermal conductivity (W/(m.K) | BTU (IT) ft/hr/ft^2/F)	30.8 | 17.8
Specific heat (J/(kg.K) | BTU (IT) lb/F)	430 | 102.7
Spec. electrical resistance (Ohm.mm^2/m | 10^{-4} Ohm.inch^2/ft)	-
Modulus of elasticity (10^{3}N/mm^2 | 10^{3}ksi)	212 | 30.8

Thermal Expansions

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))	10.75 | 5.972	11.56 | 6.422	12.11 | 6.728	12.5 | 6.944	12.81 | 7.117	13.28 | 7.378

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