BÖHLER

BÖHLER K390 MICROCLEAN®

COLD WORK STEELS

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 K390 MICROCLEAN is a high-alloyed, high-performance cold work tool steel manufactured using powder metallurgy. This material has the highest alloy content in the group of cold work tool steels with high vanadium content. The high alloy content gives this material outstanding wear resistance. At the same time, the powder metallurgical manufacturing process creates a uniform matrix with finely distributed primary carbides. Among other things, this leads to good material toughness. BÖHLER K390 MICROCLEAN is a problem solver for applications requiring extremely high wear resistance and compressive strength.

Process Melting

Powder metallurgy

Properties

- Toughness & Ductility : high
- Wear Resistance : very high
- Compressive strength : very high
- Dimensional stability : very high

Applications

- Machine knife (for producers)
- Coining
- Screws and Barrels
- Rolls
- Pill punching dies
- Rolling
- Fine Blanking, Stamping, Blanking
- Thread rolling
- Comps. for Equip. Below Ground (Boring, Shafts, etc.)
- Glasfibre reinforced plastics
- Cold Forming
- Powder Pressing
- General Components for Mechanical Engineering
- Components for Recycling Industry

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	W	Co
2.47	0.55	0.40	4.20	3.80	9.00	1.00	2.00

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive	Wear resistance adhesive
BÖHLER K390 MICROCLEAN®	★★★★★	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER K100	★★	★★	★	★★★	★★
BÖHLER K105	★★	★★	★	★★	★★
BÖHLER K107	★★	★★	★	★★★	★★
BÖHLER K110	★★	★★★	★	★★★	★★
BÖHLER K190 MICROCLEAN®	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K294 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K340 ECOSTAR®	★★★	★★★	★★	★★	★★
BÖHLER K340 ISODUR®	★★★	★★★★	★★★	★★★	★★★★
BÖHLER K346	★★★	★★★	★★★	★★★★	★★
BÖHLER K353	★★	★★★	★★	★★	★★
BÖHLER K360 ISODUR®	★★★	★★★★	★★★	★★★★	★★★★
BÖHLER K490 MICROCLEAN®	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K497 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K888 MATRIX	★★★★	★★★★★	★★★★★	★★	★★
BÖHLER K890 MICROCLEAN®	★★★★	★★★★★	★★★★★	★★★	★★★

Delivery condition

Annealed

Hardness (HB)	max. 280

Heat treatment

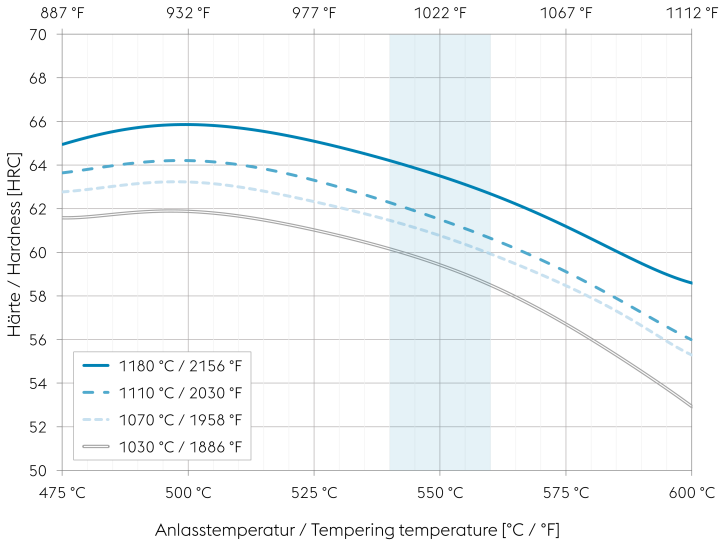
Stress relieving

Temperature	650 to 700 °C | 1,202 to 1,292 °F	Once heated completely through, soak in neutral atmosphere at temperature for 1 to 2 hours. Slow cooling in furnace.

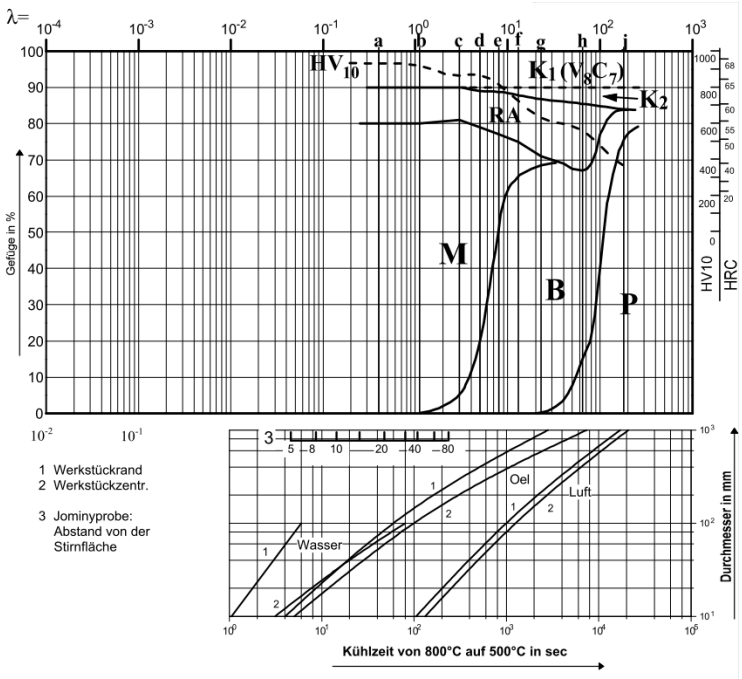
Hardening and Tempering

Temperature	1,030 to 1,180 °C | 1,886 to 2,156 °F	Oil, N_2. Once heated completely through: • 20 - 30 min (hardening temperature 1030 - 1150 °C) • 10 min (hardening temperature 1180 °C) For high toughness, use a low hardening temperature. For high wear resistance, use a high hardening temperature. After hardening, tempering to the desired working hardness, see tempering chart.

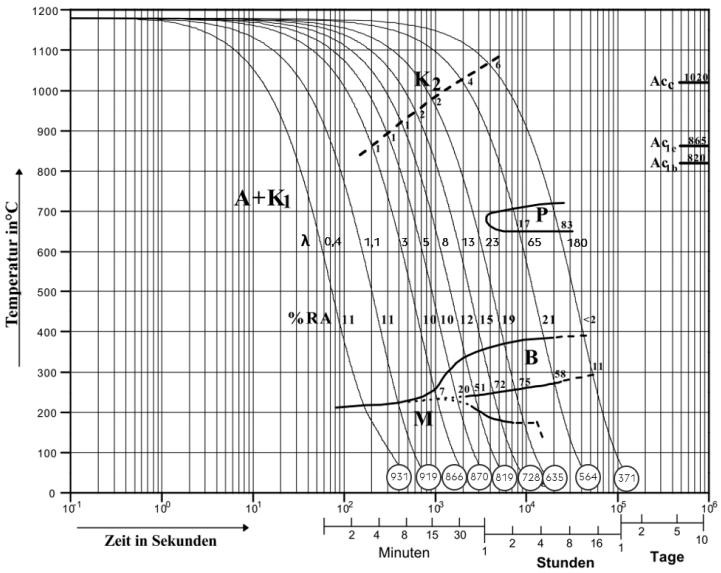
Tempering chart



Quantitative phase diagram



Continuous cooling CCT curves



Physical Properties

Temperature (°C | °F)	20 | 68
Density (kg/dm³ | lb/in³)	7.6 | 0.27
Thermal conductivity (W/(m.K) | BTU/ft h °F)	21.5 | 12.42
Specific heat (kJ/kg K | BTU/lb °F)	0.464 | 0.1108
Spec. electrical resistance (Ohm.mm²/m | 10⁻⁴ Ohm.inch²/ft)	0.59 | 2.79
Modulus of elasticity (10³N/mm² | 10³ksi)	220 | 31.91

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

Temperature (°C | °F)	100 | 212	200 | 392	300 | 572	400 | 752	500 | 932	600 | 1,112
Thermal expansion (10⁻⁶ m/(m.K) | 10⁻⁶ inch/inch. °F)	10.3 | 5.7	10.67 | 5.9	11.03 | 6.1	11.38 | 6.3	11.7 | 6.5	11.97 | 6.6

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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voestalpine
ONE STEP AHEAD.