BÖHLER

BÖHLER K890
MICROCLEAN®

COLD WORK STEELS

Available Product Variants

Long Products | Plates | Open Die Forgings

Product Description

BÖHLER K890 MICROCLEAN – This powder-metallurgical cold-working steel has good toughness, very good compressive strength, and excellent fatigue strength.

Process Melting

Powder metallurgy

Properties

- Toughness & Ductility: very high
- Good toughness means safety against cracking of the molds in use: very high
- Uniformly high strength and toughness, even with large dimensions: very high
- Wear Resistance: good
- Compressive strength: high
- Dimensional stability: very high
- Excellent homogeneity and isotropy: very high
- Fine carbide structure: very high
- Homogeneous microstructure: very high

Applications

- Machine knife (for producers)
- Coining
- General Components for Mechanical Engineering
- Fine Blanking, Stamping, Blanking
- Rolling
- Powder Pressing
- Components for Recycling Industry
- Cold Forming
- Wear parts
- Pill punching dies

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	W	Co
0.85	0.55	0.40	4.35	2.80	2.10	2.55	4.50

voestalpine BÖHLER Edelstahl GmbH & Co KG
https://www.voestalpine.com/bohler-edelstahl/de/

voestalpine
ONE STEP AHEAD.

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive	Wear resistance adhesive
BÖHLER K890 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 K390 MICROCLEAN®	★★★★★	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER K490 MICROCLEAN®	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K497 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★

Delivery condition

Annealed

Hardness (HB)	max. 280

Heat treatment

Soft annealing

Temperature	650 to 700 °C | 1202 to 1292 °F	Depending on the application, hardness can be adjusted by using specialized annealing treatment.

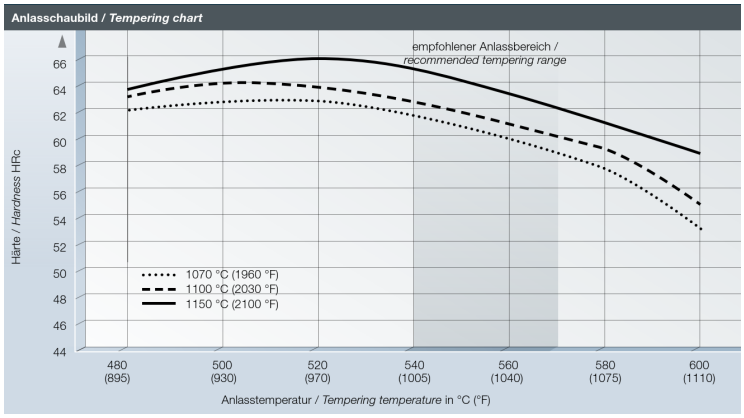
Stress relieving

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

Hardening and Tempering

Temperature	1070 to 1150 °C | 1958 to 2102 °F	Following temperature equalisation: 20-30 minutes for a hardening temperature of 1070 - 1100 °C (1960 - 2010 °F) 6 minutes for a hardening temperature of 1150 °C (2100 °F) After hardening, tempering to the desired working hardness, see tempering chart.

Tempering chart



Tempering:

Hardening temperature:
• • • 1070°C/1960°F
- - - - - - 1100°C/2030°F
——— 1150°C/2100°F

Slow heating to tempering temperature immediately after hardening.

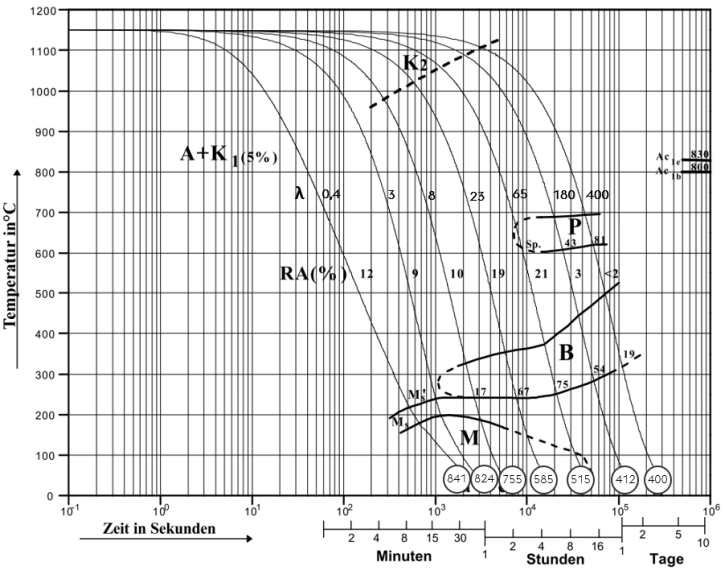
Dwell time in the oven 1 hour per 20 mm workpiece thickness, but at least 2 hours.

Slow cooling to room temperature after each tempering step is recommended.

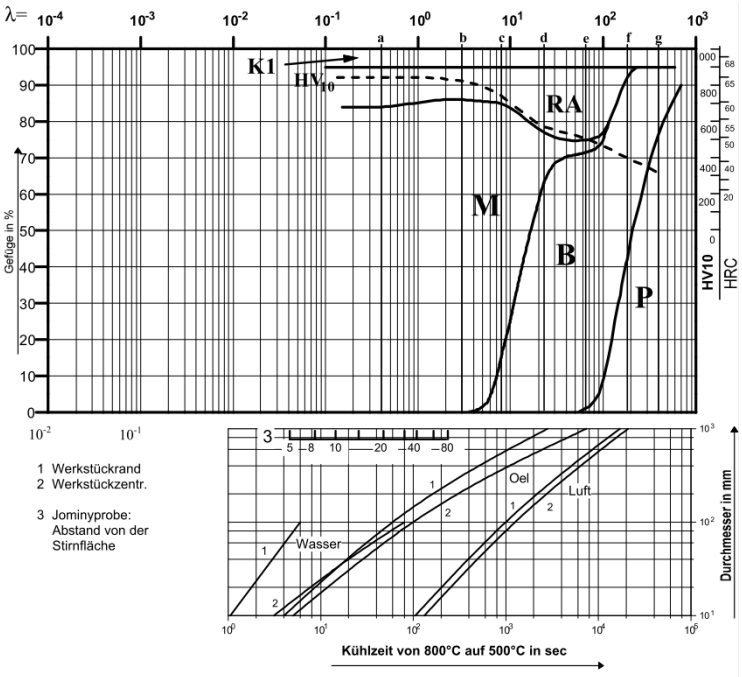
Tempering at 540-570 °C (1004-1058 (°F)) at least three times is recommended.

Please refer to the tempering diagram for guide values for the achievable hardness after tempering. Tempering for stress relieving 30 to 50°C below the highest tempering temperature.

Continuous cooling CCT curves



Quantitative phase diagram



Physical Properties

Temperature (°C | °F)	20 | 68
Density (kg/dm³ | lb/in³)	7.85 | 0.28
Thermal conductivity (W/(m.K) | BTU (IT) ft/hr/ft²/F)	22.5 | 13
Specific heat (J/(kg.K) | BTU (IT) lb/F)	450 | 107.48
Spec. electrical resistance (Ohm.mm²/m | 10⁻⁴ Ohm.inch²/ft)	0.5 | 2.36
Modulus of elasticity (10³N/mm² | 10³ksi)	218 | 31.56

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

Temperature (°C | °F)	100 | 212	200 | 392	300 | 572	400 | 752	500 | 932	600 | 1112	700 | 1292
Thermal expansion (10^{-6} m/(m.K) | 10^{-6} inch/(inch.F))	10.5 | 5.8	11 | 6.1	11.3 | 6.3	11.7 | 6.5	12.1 | 6.7	12.4 | 6.9	12.9 | 7.2

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

voestalpine BÖHLER Edelstahl GmbH & Co KG
Mariazeller Straße 25
8605 Kapfenberg, AT
T. +43/50304/20-0
E. info@bohler-edelstahl.at
https://www.voestalpine.com/bohler-edelstahl/de/

voestalpine
ONE STEP AHEAD.