

COLD WORK STEELS

Available Product Shapes

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

Product Description

BÖHLER's cold work tool steel K490 MICROCLEAN closes the gap in the material demands between wear resistance and the desired high toughness.

Properties

- High hardness (up to 64 HRC)
- Very good toughness
- High abrasive and adhesive wear resistance
- Excellent hard machinability
- High compressive strength
- Heat treatment together with common cold work tool steels (1.2379, D2) at hardening temperatures from 1030 to 1080 °C (1885 – 1980 °F) possible
- Stable mechanical properties

Applications

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

Chemical composition

| C | Cr | Mo | V | W | Nb |
|------|------|------|------|------|----|
| 1.40 | 6.40 | 1.50 | 3.70 | 3.50 | + |

Material characteristics

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

Delivery condition

| Annealed | |
|----------|-------------|
| Hardness | max. 280 HB |

Heat treatment

| Stress relieving | | |
|-------------------------|---------------------------|--|
| Temperature (°C / °F) | 650 / 1202 - 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) | 1030 / 1886 - 1080 / 1976 | Oil, N. Following temperature equalisation: 20 - 30 minutes for a hardening temperature of 1030 - 1080 °C (1885 - 1980 °F). After hardening, tempering to the desired working hardness, see tempering chart. |

Physical Properties at 20°C / 68°F

| | | |
|-----------------------------|---------------|---|
| Density | 7.79 / 0.28 | [kg/dm ³ / lb/in ³] |
| Thermal conductivity | 19.6 / 11.32 | [W/(m.K) / BTU (IT) ft/hr/ft ² /F] |
| Specific heat | 450 / 107.48 | [J/(kg.K) / BTU (IT) lb/F] |
| Spec. electrical resistance | 0.55 / <0.001 | [Ohm.mm ² /m / Ohm.inch ² /ft] |
| Modulus of elasticity | 223 / 32.34 | [10 ³ N/mm ² / 10 ³ ksi] |

Thermal Expansions

| 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)) | 10.6 / 5.889 | 11.1 / 6.167 | 11.6 / 6.444 | 11.9 / 6.611 | 12.3 / 6.833 | 12.6 / 7 | 12.8 / 7.111 |

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

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ONE STEP AHEAD.