COLD WORK TOOL STEELS

Application Segments

Cold Work

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 K340 ECOSTAR belongs to the group of conventionally produced 8% chromium steels. Compared to conventional 12% chromium steels, this conventionally smelted tool steel has better toughness, hardening response and higher adhesive wear resistance. This combination of high adhesive wear resistance and toughness also offers advantages for industrial knives subject to high stress. This grade is also used for stamping and cutting tools.

Process Melting

Airmelted

Properties

- Compressive strength : good
- Dimensional stability : good

Applications

- Machine knife (for producers)
- Powder Pressing
- Thread rolling
- Extrusion
- Mechanical Engineering
- Packaging industry
- Rolling
- Screws and Barrels
- Industrial Knives
- Grinding
- Components for the recycling industry
- Cold Forming / Coining
- Fine Blanking, Stamping, Blanking
- Wear parts
- Cutting
- Packaging
- Roll Forming

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	Others
1.10	0.70	0.40	8.20	2.10	0.50	+Al, Nb

Material characteristics

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

Delivery condition

Annealed

Hardness (HB)	max. 235

Heat treatment

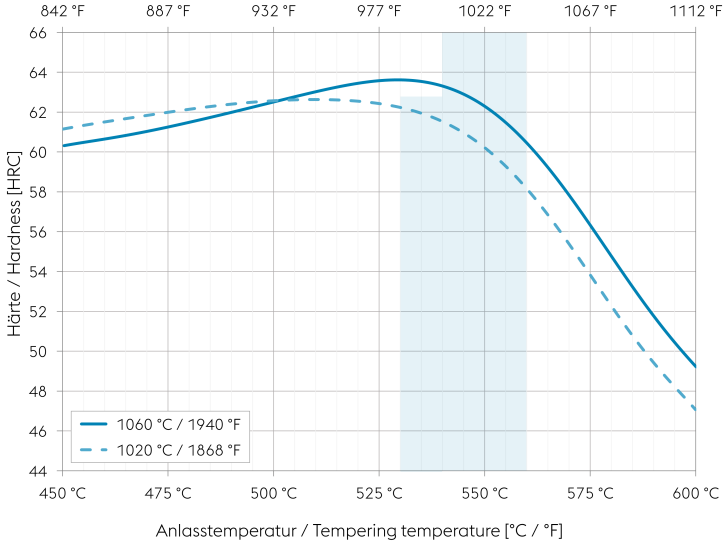
Stress relieving

Temperature	650 °C	After through heating, hold in neutral atmosphere for 1-2 hours. || Slow cooling in furnace || Intended to relieve stresses caused by extensive machining or in complex shapes.

Hardening and Tempering

Temperature	1,020 to 1,060 °C	Quenching: Oil, salt bath, compressed air, air, gas. || Holding time after temperature equalization: 15 to 30 minutes. || After hardening, tempering to the desired working hardness according to the tempering chart.

Tempering chart



Specimen size: square 20 mm (0,787 inch)

Slow heating to tempering temperature immediately after hardening.

Time in furnace 1 hour for each 20 mm (0,787 inch) of workpiece thickness but at least 2 hours.

Please refer to the tempering chart for guide values for the achievable hardness after tempering.

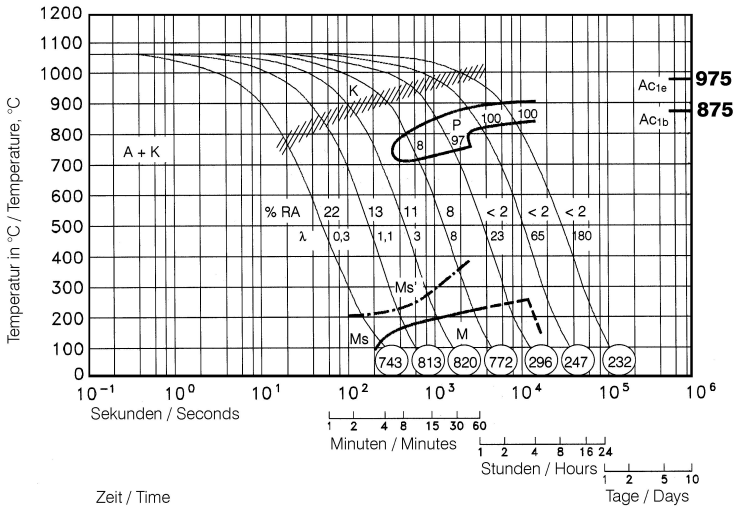
It is recommended to temper at least three times above the secondary hardness maximum.

Cooling in air to room temperature after each tempering step is recommended.

Tempering for stress relieving 30 to 50 °C (86 to 122 °F) below the highest tempering temperature.

Recommended tempering temperature range is indicated by the blue area in the chart.

Continuous cooling CCT curves



Austenitising temperature: 1060 °C (1940 °F)
Holding time: 30 minutes

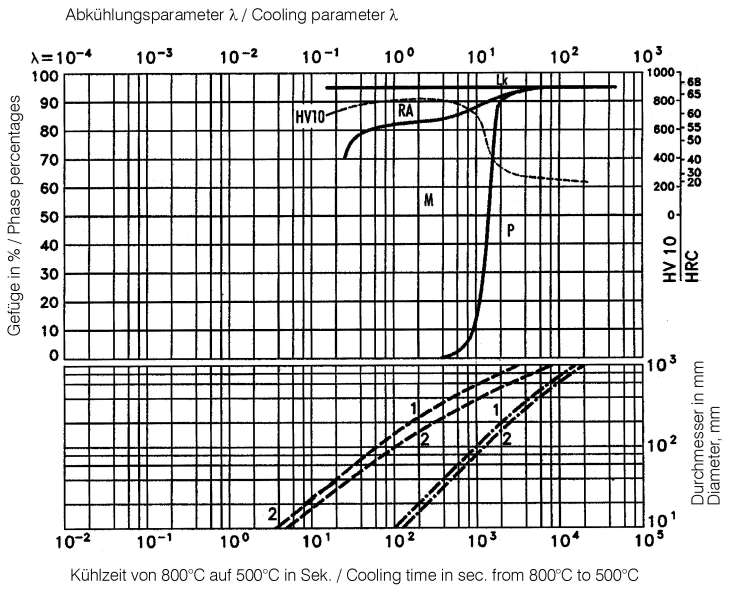
◯ Vickers hardness

8...100 phase percentages

0.3...180 cooling parameter λ, i.e. duration of cooling from 800 to 500 °C (1472 to 932 °F) in s x 10^{-2}

A... Austenite
K... Carbide
P… Perlite
RA... Residual austenite
M… Martensite
Ms… Martensite starting temperature

Quantitative phase diagram



HV10… Vickers Hardness
LK... Ledeburitic carbides
RA... Retained austenite
M... Martensite
P... Perlite

- - - Oil cooling
- • - Air cooling

1... Edge or face
2... Core

Physical Properties

Temperature (°C)	**20**
Density (kg/dm³)	7.68
Thermal conductivity (W/(m.K))	17.8
Specific heat (kJ/kg K)	0.49
Spec. electrical resistance (Ohm.mm²/m)	0.64
Modulus of elasticity (10³N/mm²)	206

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

Temperature (°C)	**100**	**200**	**300**	**400**	**500**	**600**	**700**
Thermal expansion (10⁻⁶ m/(m.K))	11.2	11.8	12.3	12.7	12.9	13.1	13.1

If other available product variants are listed in addition to long products, please note that these may differ in terms of melting process, technical data, delivery and surface condition as well as available product dimensions. For mandatory technical specifications, other requirements and dimensions, please contact our regional voestalpine BÖHLER sales companies. 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.

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ONE STEP AHEAD.