

COLD WORK STEELS

Available Product Variants

[Long Products*](#)
[Plates](#)

*) Presented data refer exclusively to long products. Please observe the detailed explanations at the end of the data sheet (pdf).

Product Description

BÖHLER K306 belongs to the group of 5% chromium steels and is approximately equivalent to the material 1.2345 (~X50CrMoV5 1). Its alloy composition, however, has a higher vanadium content, making BÖHLER K306 more wear resistant than the conventional hot work tool steel 1.2345. BÖHLER K306 is used in hot work applications and for stamping and cutting tools. With its high toughness and resulting high fracture safety, this material is also very suitable for machine knives in the wood, paper and recycling industries.

Process Melting

[Airmelted](#)

Properties

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

Applications

- > Cold Forming
- > Fine Blanking, Stamping, Blanking

Technical data

Material designation	
~1.2345	SEL
~X50CrMoV5-1	EN

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V
0.51	0.95	0.30	5.00	1.40	1.40

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive
BÖHLER K306	★★★★	★★★	★★★★	★★★
BÖHLER K305	★★★★★	★★★	★★	★★★★★
BÖHLER K313	★★★★	★★★	★★★	★★★
BÖHLER K320	★★★	★★★	★★★	★★★
BÖHLER K329	★★★	★★★	★★★★	★★★★
BÖHLER K600	★	★★★	★★★★★	★
BÖHLER K601	★	★★★	★★★★	★★
BÖHLER K605	★★	★★★	★★★★	★

Delivery condition

Annealed

Hardness (HB)	max. 240
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Heat treatment

Annealing

Temperature	750 to 800 °C 1,382 to 1,472 °F	Slow controlled cooling in furnace at a rate of 50 to 68°F/hr (10 to 20°C/hr) down to approx. 1112°F (600°C), further cooling in air.
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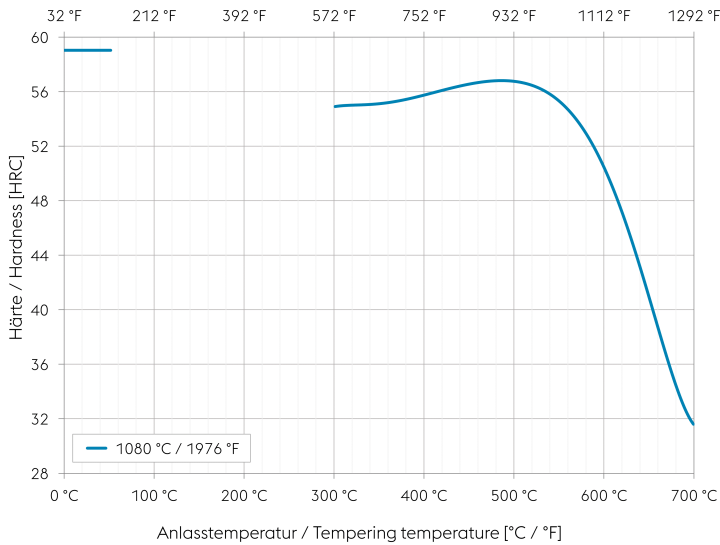
Stress relieving

Temperature	650 °C 1,202 °F	Slow cooling in furnace; intended to relieve stresses set up by extensive machining, or in complex shapes. After through heating, hold in neutral atmosphere for 1-2 hours.
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Hardening and Tempering

Temperature	1,050 to 1,100 °C 1,922 to 2,012 °F	Oil, salt bath 932 to 1022°F (500 - 550°C), air. (For maximum toughness, lower hardening temperature range) Holding time after temperature equalization: 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart.
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Tempering chart



Tempering:

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

Slow heating to tempering temperature immediately after hardening.

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

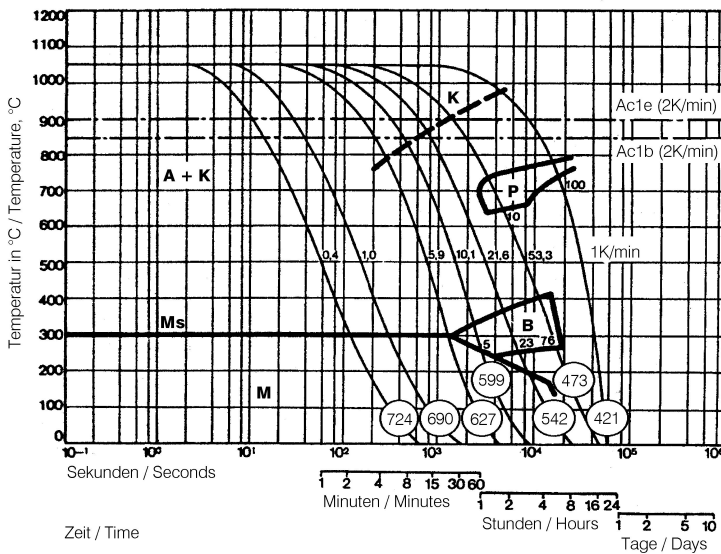
Please refer to the tempering chart for guide values for the hardness achievable after tempering.

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

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

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

Continuous cooling CCT curves



Austenitising temperature: 1050°C
Holding time: 15 minutes

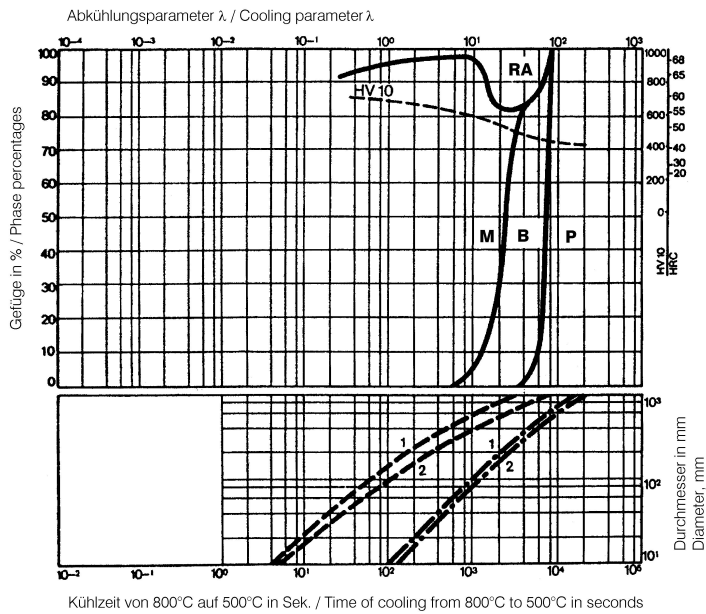
O Vickers hardness

10...100 phase percentages

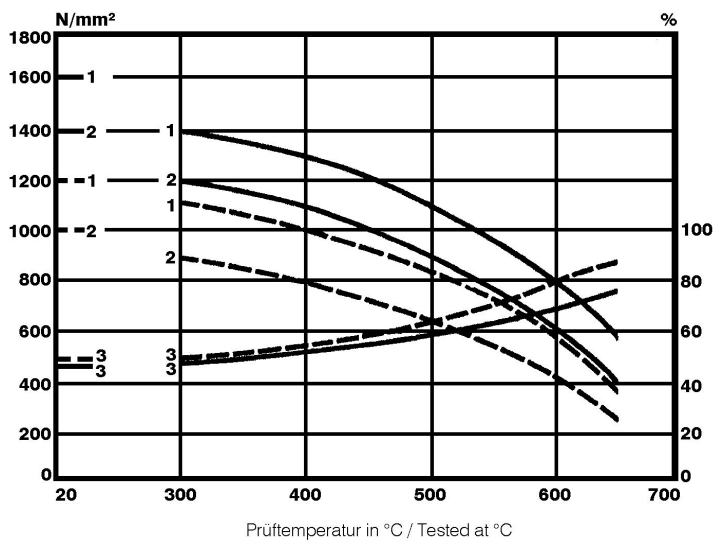
0.4...53.3 cooling parameter, i.e. duration of cooling from 800°C to 500°C in $s \times 10^{-2}$

1K/min...cooling rate in K/min in the 800°C to 500°C range

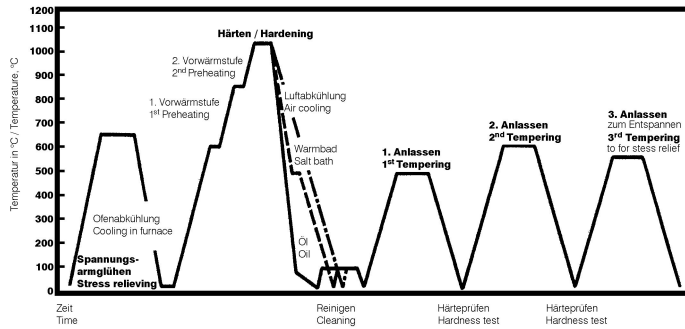
Quantitative phase diagram



Hot strength chart



Heat treatment sequence



Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.8 0.28
Thermal conductivity (W/(m.K) BTU/ft h °F)	25 14.44
Specific heat (kJ/kg K BTU/lb °F)	0.46 0.1099
Spec. electrical resistance (Ohm.mm ² /m 10 ⁻⁴ Ohm.inch ² /ft)	0.52 2.46
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	215 31.18

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

Temperature (°C °F)	100 212	200 392	300 572	400 752	500 932
Thermal expansion (10^{-6} m/(m.K) 10^{-6} inch/inch.°F)	11.5 6.4	12 6.7	12.2 6.8	12.5 6.9	12.9 7.2

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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