

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 K605 is approximately equivalent to the material 1.2721 (~50NiCr13). The alloy concept of this tool steel is similar to the one of 1.2767. With its high nickel content, this material offers a very good combination of through hardenability and toughness. The higher carbon content compared to material 1.2721 results in a better hardening response and consequently higher compressive strength. The material is used in applications such as forming, bending and embossing tools.

Process Melting

[Airmelted](#)

Properties

- > Toughness & Ductility : high
- > Dimensional stability : good

Applications

- > Machine knife (for producers)
- > Fine Blanking, Stamping, Blanking
- > Components for Recycling Industry
- > Cold Forming
- > Standard Parts (Molds, Plates, Pins, Punches)
- > Coining
- > General Components for Mechanical Engineering

Technical data

Material designation	
~1.2721	SEL
~50NiCr13	EN

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	Ni
0.55	0.30	0.40	1.00	0.25	3.00

Material characteristics

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

Delivery condition

Annealed

Hardness (HB)	max. 250
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Heat treatment

Annealing

Temperature	610 to 650 °C 1,130 to 1,202 °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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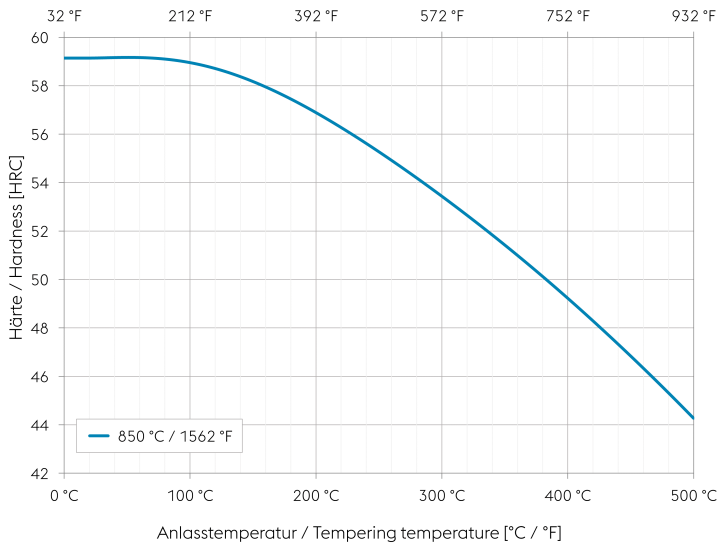
Stress relieving

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	840 to 870 °C 1,544 to 1,598 °F	Air, Oil Holding time after temperature equalization: 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart.
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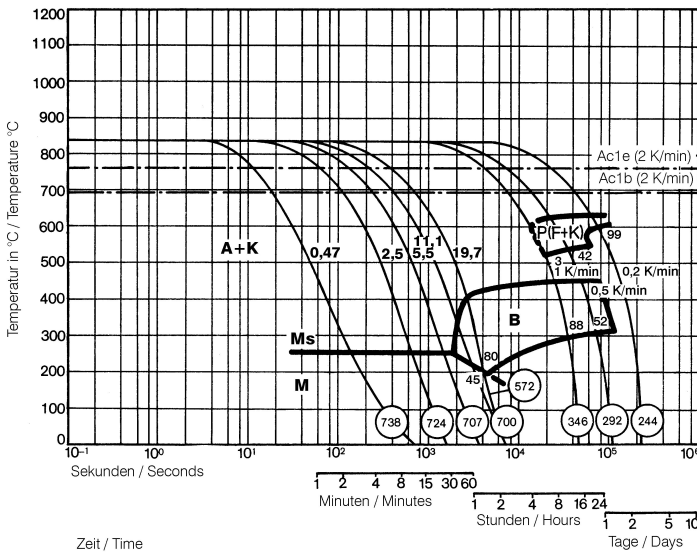
Tempering chart



Tempering:

Hardening temperature: 850°C
 Specimen size: square 20 mm

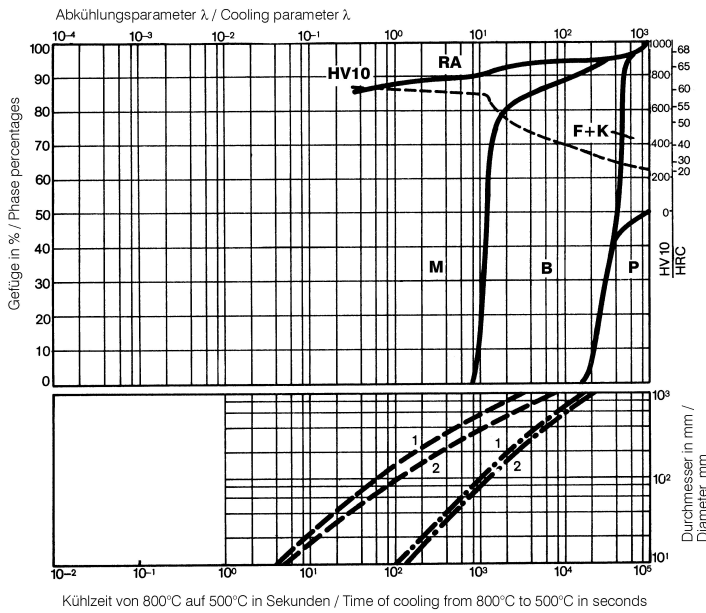
Continuous cooling CCT curves



Austenitising temperature: 1544°F (840°C)
 Holding time: 20 minutes

O Vickers hardness
 3...99 phase percentages
 0.47...19.7 cooling parameter, i.e. duration of cooling from 1472 to 932°F (800 to 500°C) in $s \times 10^{-2}$
 33,8...32,36°F/min (1...0.2K/min) cooling rate in °F/min (K/min) in the 1472 to 932°F (800 to 500°C) range.

Quantitative phase diagram

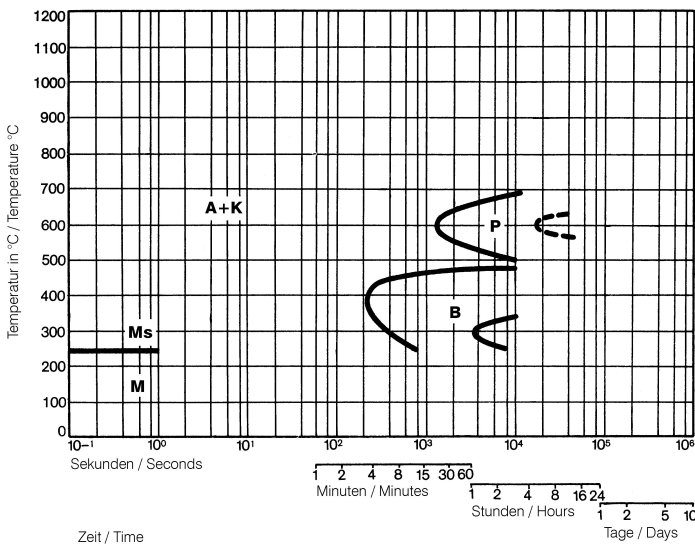


A... Austenite
 B... Bainite
 F... Ferrite
 K... Carbide
 M... Martensite
 P... Pearlite
 RA... Retained austenite

--- Oil cooling
 - · - Air cooling

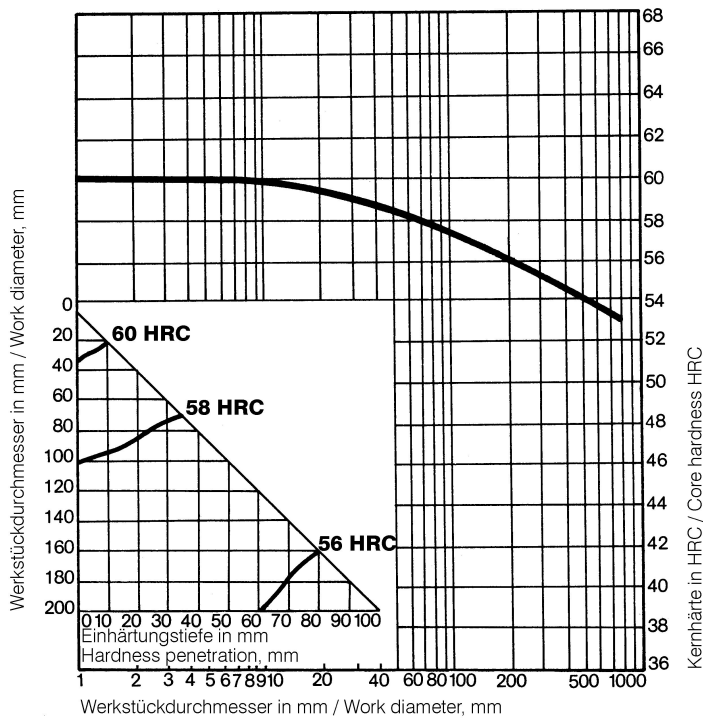
1... Edge or face
 2... Core

Isothermal TTT curves



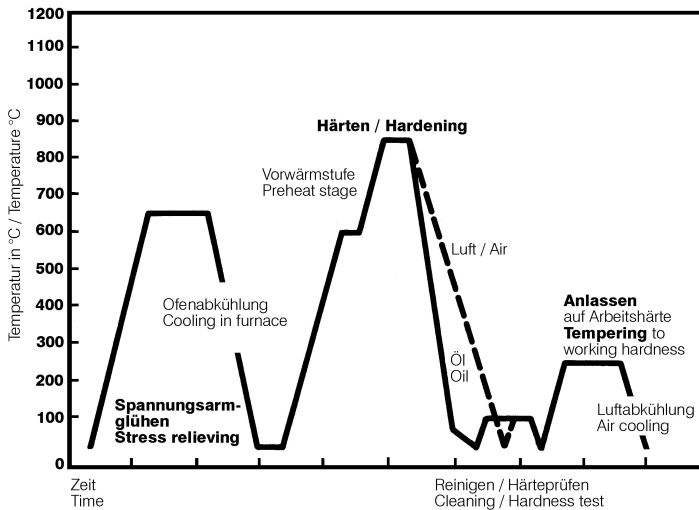
Austenitising temperature: 840°C / 1544°F
 Holding time: 20 minutes

Influence of work diameter on core hardness and hardness penetration



Quenched from: 850°C / 1562°F
Agent: Oil

Heat treatment sequence



Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.85 0.28
Thermal conductivity (W/(m.K) BTU/ft h °F)	28 16.18
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)	0.3 1.42
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	210 30.46

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 6.1	12.5 6.9	13 7.2	13.5 7.5	14 7.8

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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