COLD WORK STEELS

Available Product Variants

Long Products | Plates | Open Die Forgings

Product Description

BÖHLER K720 is corresponds to the material 1.2842 (90MNCRV8, ~O2). This material is suitable for simple heat treatment with low hardening temperatures and single tempering. However, this characteristic tempering behaviour limits the use of advanced coatings. The material has a good hardening response, but only moderate through hardenability. BÖHLER K720 is used for punching and cutting tools, plastic molds, thread cutting tools and machine knives in the wood, paper and recycling industries.

Process Melting

Airmelted

Properties

Oil hardening, dimensionally stable tool steel.

Applications

- Cold Forming
- General Components for Mechanical Engineering
- Fine Blanking, Stamping, Blanking
- Standard Parts (Molds, Plates, Pins, Punches)

Technical data

Material designation	
1.2842	SEL
~T31502	UNS
90MnCrV8	EN
~O2	AISI

Standards	
4957	EN ISO

Chemical composition (wt. %)

C	Si	Mn	Cr	V
0.90	0.25	2.00	0.35	0.10

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive
BÖHLER K720	★★	★	★★★★	★
BÖHLER K245	★★	★	★★★★★	★
BÖHLER K455	★★★	★	★★★★★	★
BÖHLER K460	★★★★	★	★★★★	★★

Delivery condition

Annealed

Hardness (HB)	max. 229

Heat treatment

Annealing

Temperature	680 to 720 °C | 1,256 to 1,328 °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.

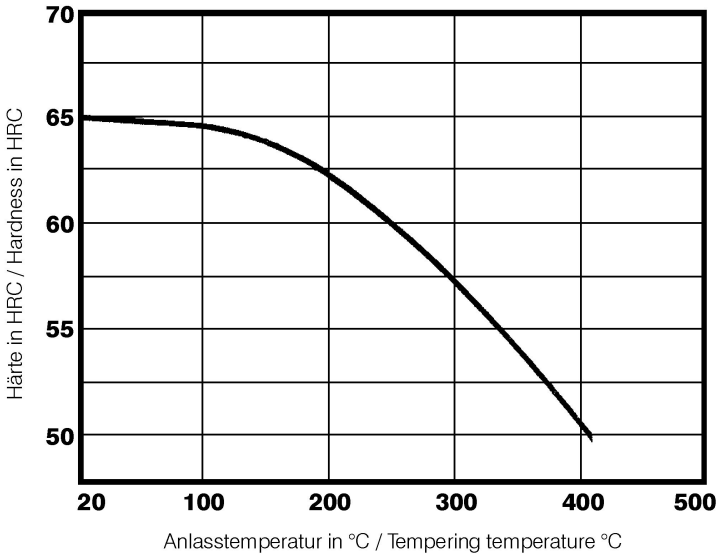
Stress relieving

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.

Hardening and Tempering

Temperature	790 to 820 °C | 1,454 to 1,508 °F	Oil, salt bath 392 - 482°F (200 to 250°C) up to 0,787 inch (20 mm) thickness. Holding time after temperature equalization: 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart.

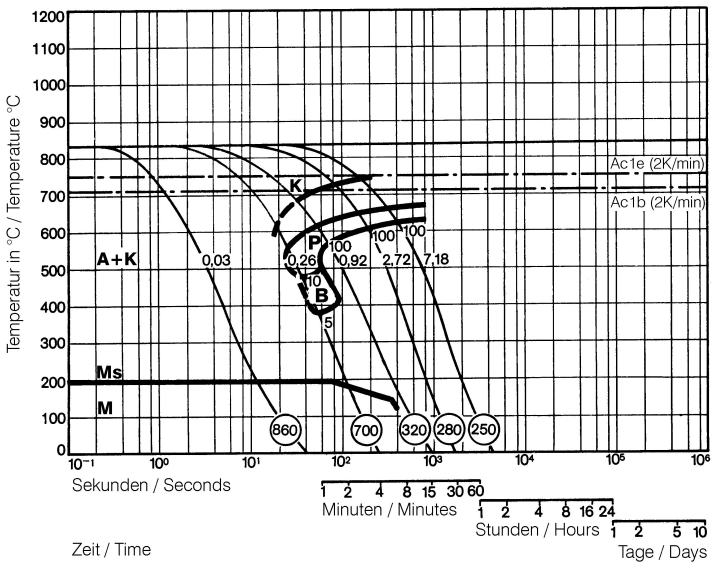
Tempering chart



Tempering:

Hardening temperature:
——— 810°C / 1490°F
Specimen size: square 20 mm

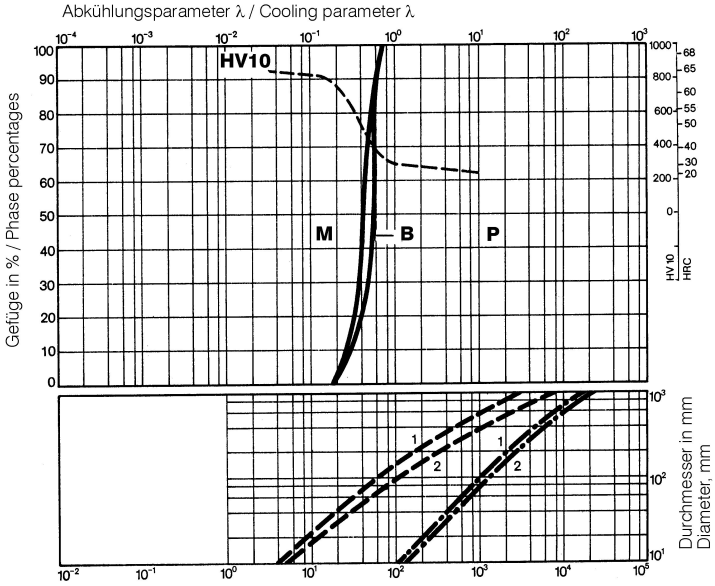
Continuous cooling CCT curves



Austenitising temperature: 1508°F (820°C)
Holding time: 15 minutes

O Vickers hardness
5...100 phase percentages
0.03...7.18 cooling parameter, i.e. duration of cooling from 1472 to 932°F (800 to 500°C) in s x 10^{-2}
35,6°F/min (2 K/min)... cooling rate in °F/min (K/min) in the 1472 to 932°F (800 to 500°C) range

Quantitative phase diagram

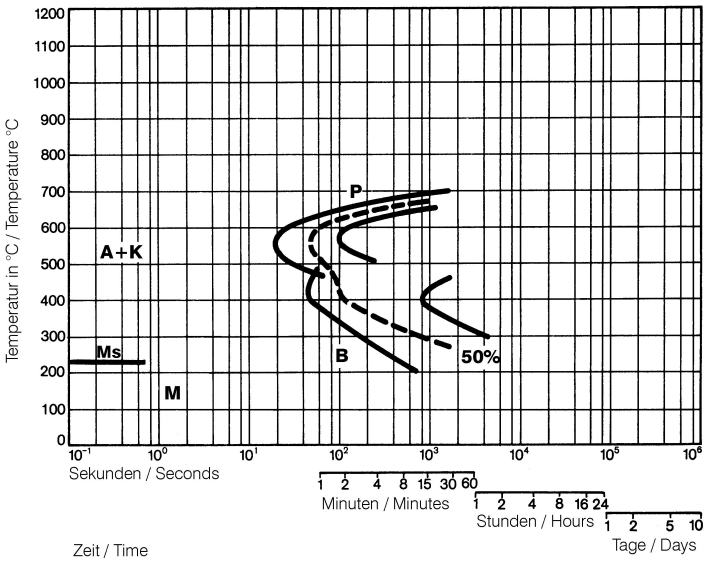


A... Austenite
B... Bainite
K... Carbide
M... Martensite
P... Perlite

- - - - - - Oil cooling
- • - Air cooling

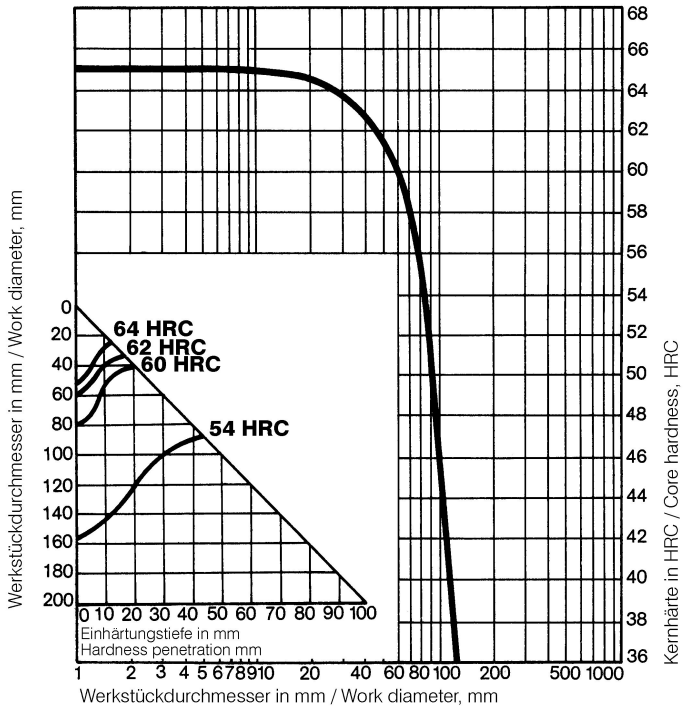
1... Edge or face
2... Core

Isothermal TTT curves



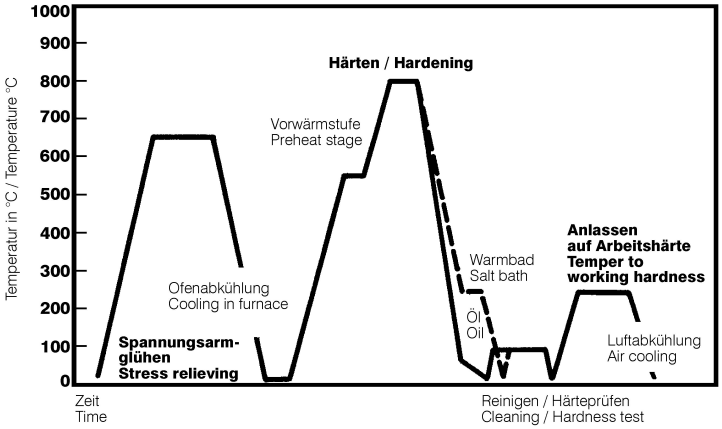
Austenitising temperature: 820°C / 1508°F
Holding time: 15 minutes

Influence of work diameter on core hardness and hardness penetration



Quenched from: 820°C / 1508°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 (IT) ft/hr/ft^2/F)	30 | 17.33
Specific heat (J/(kg.K) | BTU (IT) lb/F)	460 | 109.87
Spec. electrical resistance (Ohm.mm^2/m | 10^{-4} Ohm.inch^2/ft)	0.35 | 1.65
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))	11.5 | 6.4	12 | 6.7	12.2 | 6.8	12.5 | 6.9	12.8 | 7.1

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

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.