

ČELICI ZA HLADNI RAD

Dostupne varijante proizvoda

 Šipkasti proizvodi*

 Ploče

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

Opis proizvoda

Alati (probojci) i matrice za prosijecanje, probijanje i slične operacije

Put taljenja

 Airmelted

Karakteristike

alati za izradu navoja i obradu drveta, strojni noževi u industriji papirne mase, papira i obrade metala

Korištenje

- > Cold Forming

> Precizno štancanje / štancanje / pečačenje

> Standardni dijelovi (kalupi, ploče, klinovi, probijači)
- > Opći sklopovi za strojarstvo

Technički podaci

Oznaka materijala		Standardi	
1.2842	SEL	4957	EN ISO
~T31502	UNS		
90MnCrV8	EN		
~O2	AISI		

Kemijski sastav

C	Si	Mn	Cr	V
0,90	0,25	2,00	0,35	0,10

Materijal

	Kapacitet tlaka	Dimenzionalna stabilnost u toplinskoj obradi	Žilavost	Abraziv otpora na habanje
BÖHLER K720	★★	★	★★★★	★
BÖHLER K245	★★	★	★★★★★	★
BÖHLER K455	★★★	★	★★★★★	★
BÖHLER K460	★★★★	★	★★★★	★★

Isporuka

Annealed

Tvrdoća (HB)	max. 229
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Toplinska obrada

Annealing

Temperatura	680 do 720 °C	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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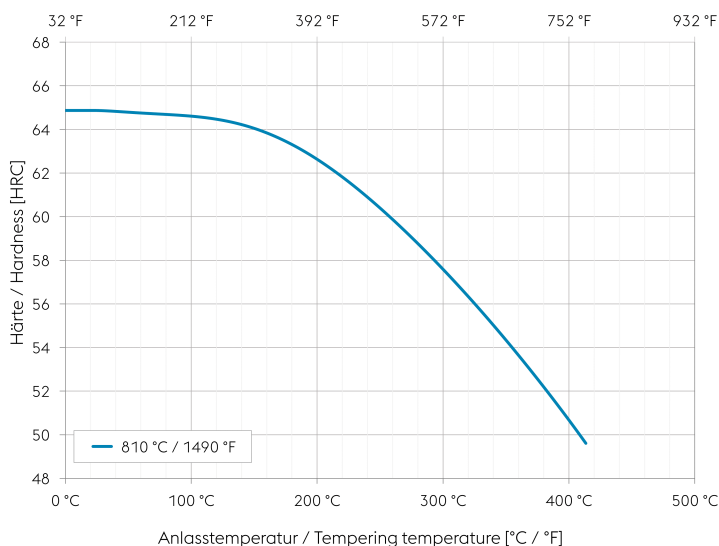
Stress relieving

Temperatura	650 °C	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

Temperatura	790 do 820 °C	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.
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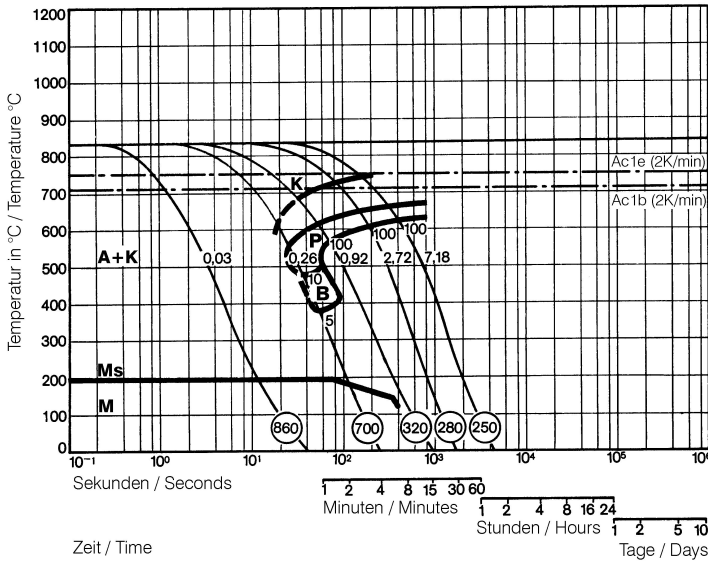
Tempering chart



Tempering:

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

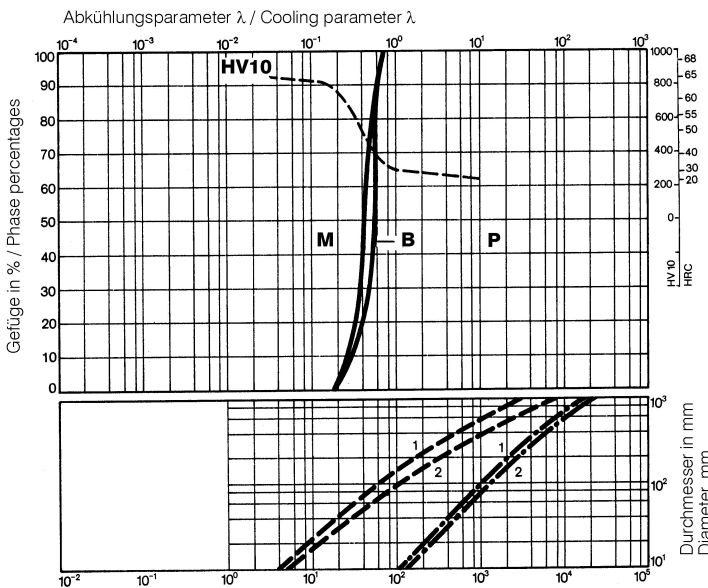
Continuous cooling CCT curves



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 $s \times 10^{-2}$
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



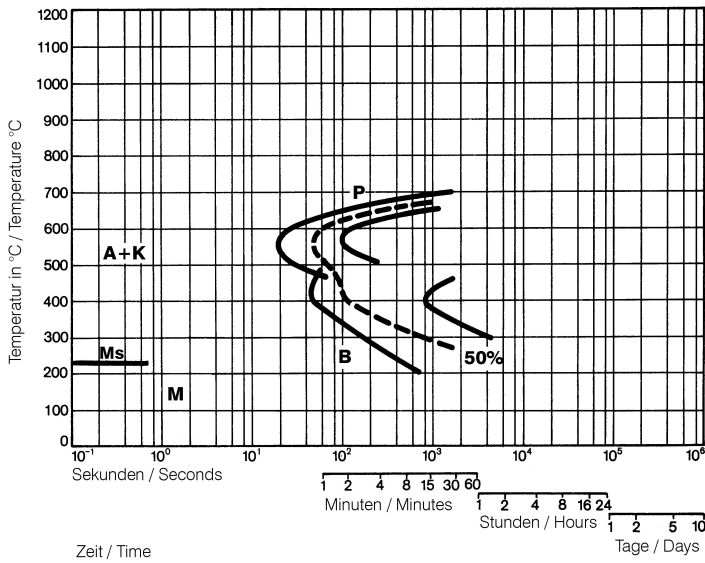
A... Austenite
B... Bainite
K... Carbide
M... Martensite
P... Perlite

----- Oil cooling
- · - Air cooling

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

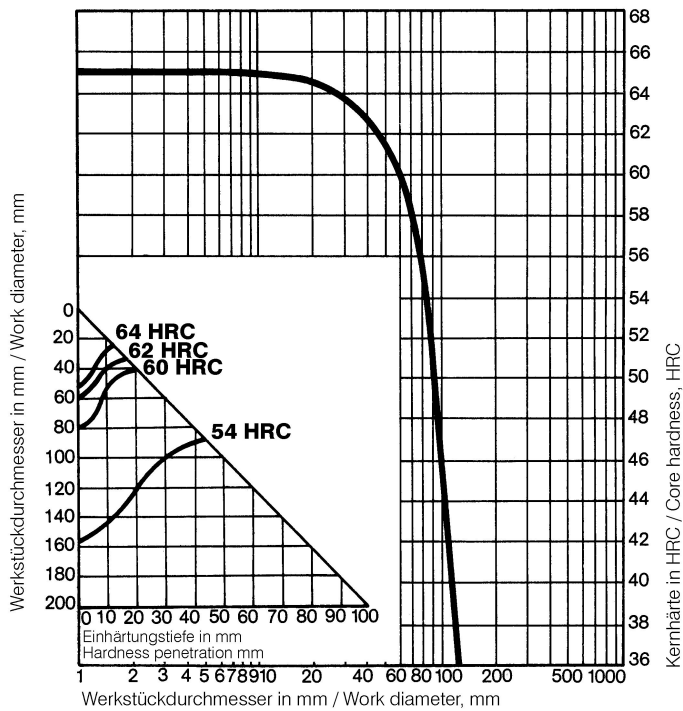
Kühlzeit von 800°C auf 500°C in Sek. / Time of cooling from 800°C to 500°C in sec.

Isothermal TTT curves



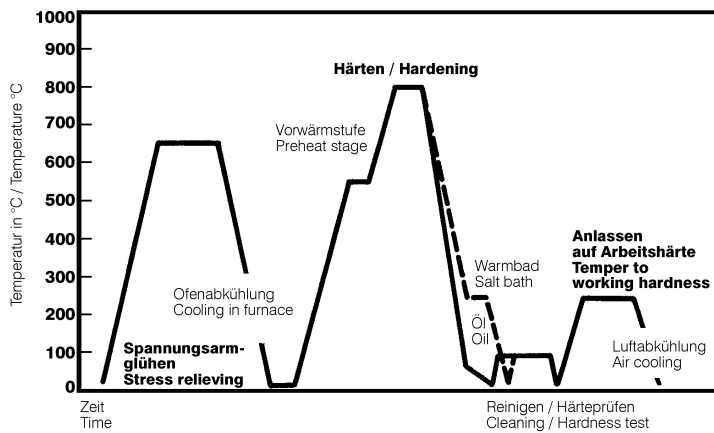
Austenitising temperature: 820°C / 1508°F
Holding time: 15 minutes

Influence of work diameter on core hardness and hardness penetration



Quenched from: 820°C / 1508°F
Agent: Oil

Heat treatment sequence



Fizička svojstva

Temperatura (°C)	20
Gustoća (kg/dm ³)	7,85
Toplinska vodljivost (W/(m.K))	30
Specifični toplinski kapacitet (kJ/kg K)	0,46
Spec. Otpornik (Ohm.mm ² /m)	0,35
Modul elastičnosti (10 ³ N/mm ²)	210

Toplinska ekspanzija

Temperatura (°C)	100	200	300	400	500
Toplinska ekspanzija (10 ⁻⁶ m/(m.K))	11,5	12	12,2	12,5	12,8

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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