

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

BÖHLER K100 - Standardni ledeburitski alatni čelici stabilnih dimenzija, s visokim udjelom ugljika i kroma (12%).

Put taljenja

 Airmelted

Karakteristike

> Otpornost na habanje : dobar

Korištenje

- > Strojni mjerni noževi (za proizvodnju)
- > Valjanje
- > Cold Forming
- > Precizno štancanje / štancanje / pečačenje
- > Standardni dijelovi (kalupi, ploče, klinovi, probijači)
- > Sklopovi za reciklažnu djelatnost
- > Valjci
- > Potrošni dijelovi
- > Opći sklopovi za strojarstvo

Technički podaci

Oznaka materijala		Standardi	
1.2080	SEL	4957	EN ISO
~T30403	UNS		
X210Cr12	EN		
~D3	AISI		
~SKD1	JIS		

Kemijski sastav

C	Si	Mn	Cr
2,00	0,25	0,35	11,50

Materijal

	Kapacitet tlaka	Dimenzionalna stabilnost u toplinskoj obradi	Žilavost	Abraziv otpora na habanje	Ljepilo za otpornost na habanje
BÖHLER K100	★★	★★	★	★★★	★★
BÖHLER K105	★★	★★	★	★★	★★
BÖHLER K107	★★	★★	★	★★★	★★
BÖHLER K110	★★	★★★	★	★★★	★★
BÖHLER K190 MICROCLEAN®	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
BÖHLER K294 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K340 ISODUR®	★★★	★★★	★★★	★★★	★★★
BÖHLER K340 ECOSTAR®	★★★	★★★	★★	★★	★★
BÖHLER K346	★★★	★★★	★★★	★★★★★	★★
BÖHLER K353	★★	★★★	★★	★★	★★
BÖHLER K360 ISODUR®	★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K390 MICROCLEAN®	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
BÖHLER K490 MICROCLEAN®	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
BÖHLER K497 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K888 MATRIX	★★★★★	★★★★★	★★★★★	★★	★★
BÖHLER K890 MICROCLEAN®	★★★★★	★★★★★	★★★★★	★★★	★★★

Isporučka
Annealed

Tvrdća (HB)

max. 248

Air Quenched

Toplinska obrada

Annealing

Temperatura	800 do 850 °C	Slow controlled cooling in furnace at a rate of 50 to 68°F (10 to 20°C/hr) down to approx. (600°C), further cooling in air.
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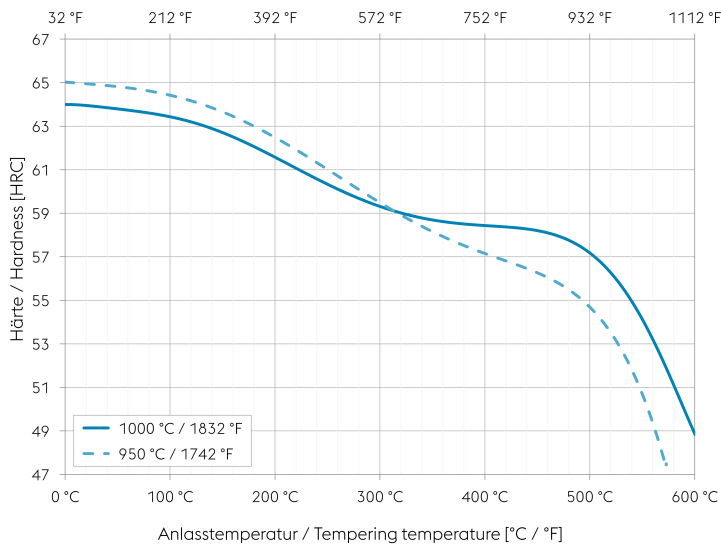
Stress relieving

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	940 do 970 °C	Oil, salt bath 428 to 482°F or 932 to 1022°F (220 to 250°C or 500 to 550°C), compressed or still air if thickness does not exceed 0,98 inch (25 mm) and if hardening temperature is on the upper side of the range, gas 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.

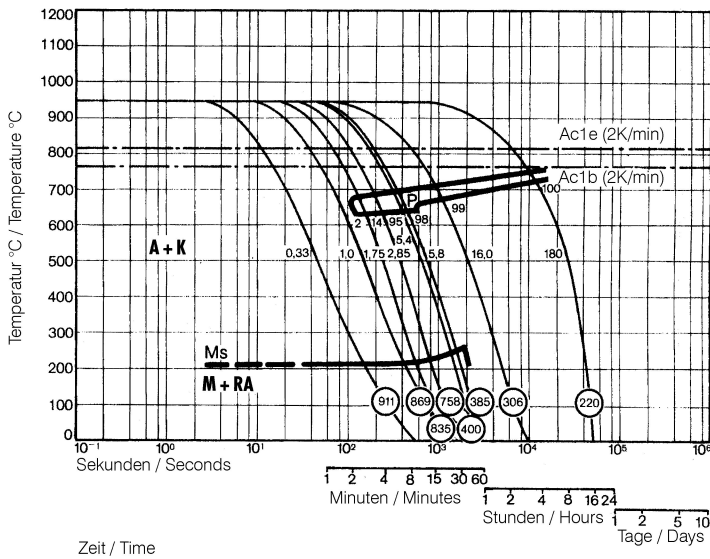
Time in furnace 1 hour for each 0,787 inch (20 mm) of workpiece thickness but at least 2 hours/cooling in air.

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

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

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

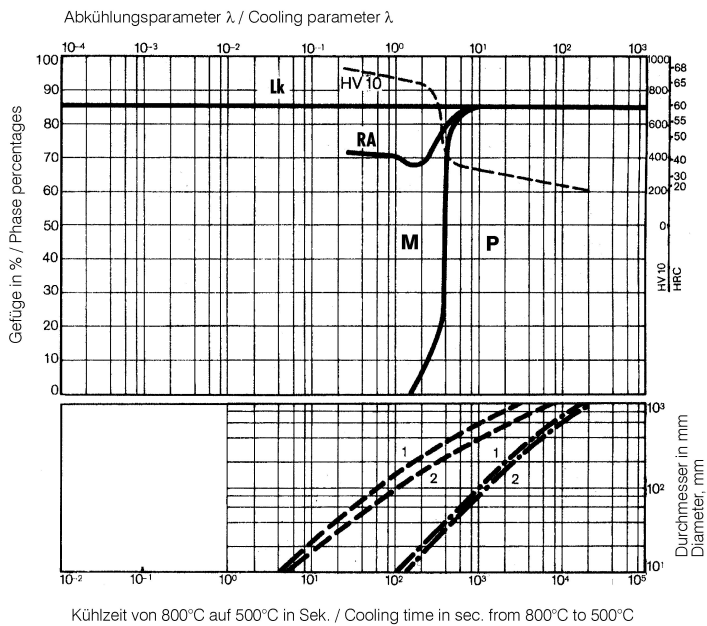
Continuous cooling CCT curves



Austenitising temperature: 1742°F (950°C)
Holding time: 30 minutes

O Vickers hardness
2...100 phase percentages
0.33...180 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 (2K/min)... cooling rate in K/min in the 1472 to 932°F (800 to 500°C) range

Quantitative phase diagram

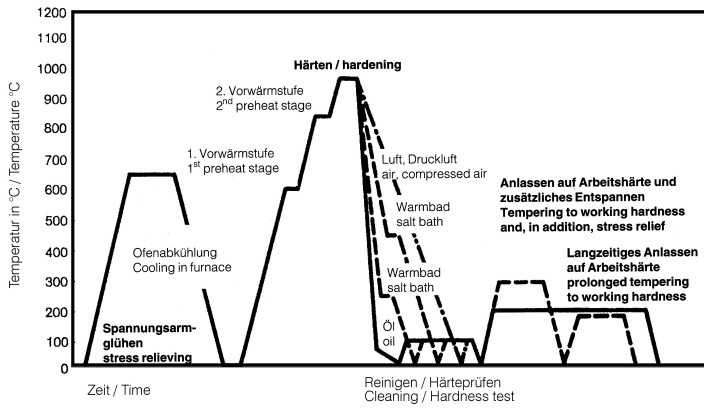


Lk... Ledeburite carbide
RA... Residual austenite
A... Austenite
M... Martensite
P... Pearlite
K... Carbide

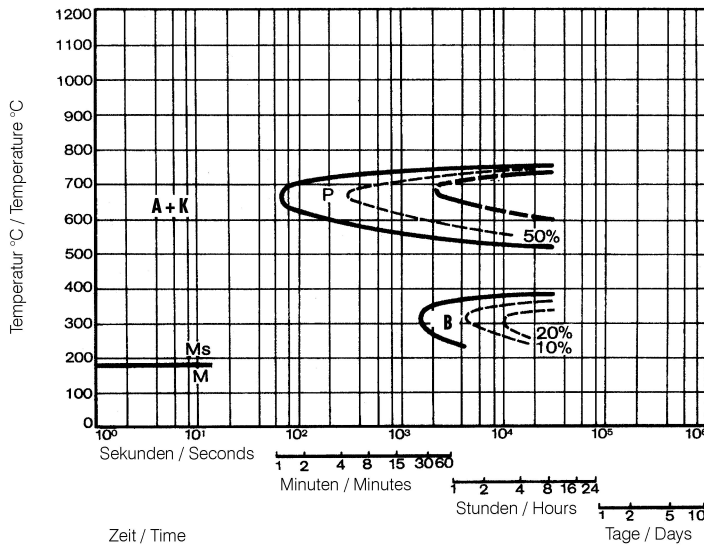
- - - - Oil cooling
- · - Air cooling

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

Heat treatment sequence

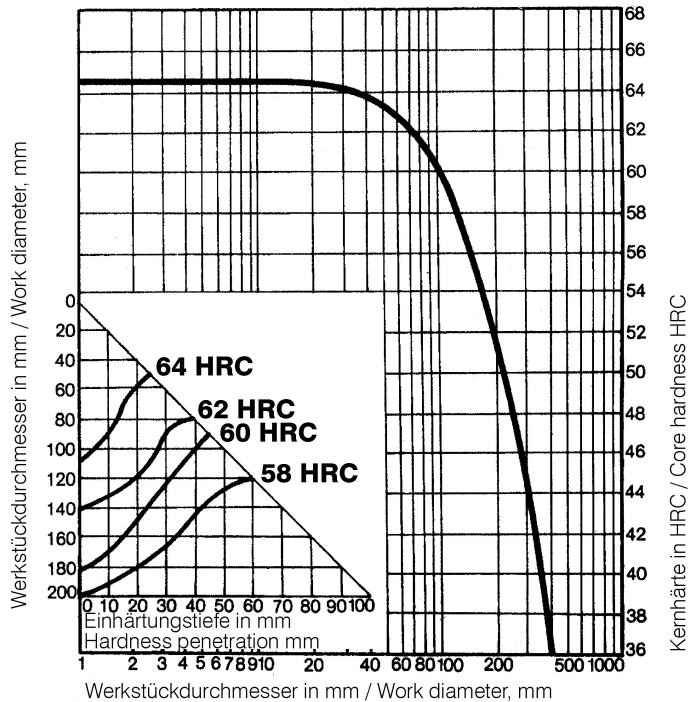


Isothermal TTT curves



Austenitizing temperature: 1742°F (950°C)
Holding time: 30 minutes

Influence of work diameter on core hardness and hardness penetration



Fizička svojstva

Temperatura (°C)	20
Gustoća (kg/dm ³)	7,7
Toplinska vodljivost (W/(m.K))	20
Specifični toplinski kapacitet (kJ/kg K)	0,46
Spec. Otpornik (Ohm.mm ² /m)	0,65
Modul elastičnosti (10 ³ N/mm ²)	210

Toplinska ekspanzija

Temperatura (°C)	100	200	300	400	500	600
Toplinska ekspanzija (10 ⁻⁶ m/(m.K))	10,5	11	11	11,5	12	12

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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ONE STEP AHEAD.