BÖHLER

BÖHLER W302
ISODISC®

ČELICI ZA TOPLI RAD

Dostupne varijante proizvoda

Šipkasti proizvodi* | Ploče | Otvoreno kovanje

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

Opis proizvoda

Alati i matrice za obradu u toplom stanju za teške uvjete rada, uglavnom za obradu lakih slitina: trnovi, matrice, cilindri za izvlačenje metalnih cijevi i šipkastih profila, alati i matrice za izradu komponenti sa šupljinom, vijaka, zakovica, navrtki i svornjaka. Oprema tlačno lijevanje, matrice za oblikovanje, umetci za kalupe, oštrice za rezanje u toplom stanju i matrice za kalupljenje plastike.

Put taljenja

Airmelted

Karakteristike

- Žilavost i duktilnost : dobar
- Otpornost na habanje : visok
- Obradivost : vrlo visoka
- Tvrdoća pri visokim temperaturama : visok
- Mogućnost poliranja : dobar
- Toplinska vodljivost : dobar
- Mikro čistoća : dobar

Korištenje

- Istiskivanje
- Gravitacijsko / niskotlačno lijevanje
- Lijevanje ubrizgavanjem
- Tlačno otvrdnjavanje / vruće oblikovanje
- Mehanika Inženjerstvo / izrada strojeva Općenito
- Kovanje (vruće / poluvruće)
- Lijevanje upuhivanjem u kalupe
- Strojni mjerni noževi (za proizvodnju)
- Progresivno kovanje (Hatebur)
- Opći sklopovi za strojarstvo
- Visokotlačno lijevanje
- Drugo Automobilski sklopovi (turbopunjači, klipno prstenje, senzori itd.)
- Držači alata (mljevenje, bušenje, okretanje i stezne glave)

Tehnički podaci

Oznaka materijala	
1.2344	SEL
T20813	UNS
X40CrMoV5-1	EN
H13	AISI
SKD61	JIS

Standardi	
4957	EN ISO
G4404	JIS

Kemijski sastav

C	Si	Mn	Cr	Mo	V
0,39	1,10	0,40	5,20	1,30	0,95

Materijal

	Otpornost na toplinu	Vrućа žilavost	Otpornost na vruće trošenje
BÖHLER W302 ISODISC®	★★★	★★★	★★★
BÖHLER W300 ISODISC®	★★	★★★	★★
BÖHLER W300 ISOBLOC®	★★	★★★★	★★
BÖHLER W302 ISOBLOC®	★★★	★★★★	★★★
BÖHLER W303 ISODISC®	★★★★	★★★	★★★★
BÖHLER W320 ISODISC®	★★★	★★	★★★
BÖHLER W350 ISOBLOC®	★★★	★★★★★	★★★
BÖHLER W360 ISOBLOC®	★★★★★	★★★★	★★★★★
BÖHLER W400 VMR®	★★	★★★★★	★★
BÖHLER W403 VMR®	★★★★	★★★★	★★★★

Isporuka

Annealed

Tvrdoća (HB)	max. 229

Hardened and Tempered

Tvrdoća (HRC)	40 do 55 | bars hardened and tempered (BHT)

Hardened and Tempered

Tvrdoća (HRC)	30 do 44

Toplinska obrada

Annealing

Temperatura	750 do 800 °C	Holding time 6 to 8 hours. Slow, controlled furnace cooling at 10 to 20°C/h (50 to 68 °F/hr) to approx. 600°C (1112°F), further cooling in air.

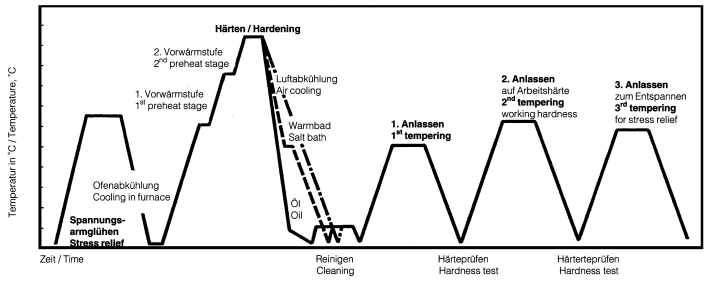
Stress relieving

Temperatura	600 do 670 °C	For stress relief after extensive machining or for complicated tools. Holding time depending on tool size after complete heating 2 - 6 hours in neutral atmosphere. Slow furnace cooling.

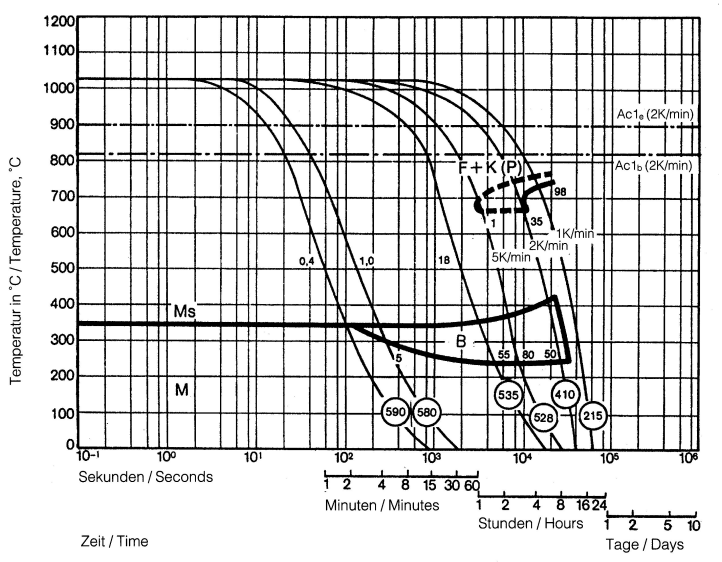
Hardening and Tempering

Temperatura	1.020 do 1.080 °C	Holding time after temperature equalization: 15 to 30 minutes; Quenching: Oil, salt bath (500 - 550°C [932-1022°F]), air, vacuum; After hardening, tempering to the desired working hardness (see tempering chart).

Heat treatment sequence



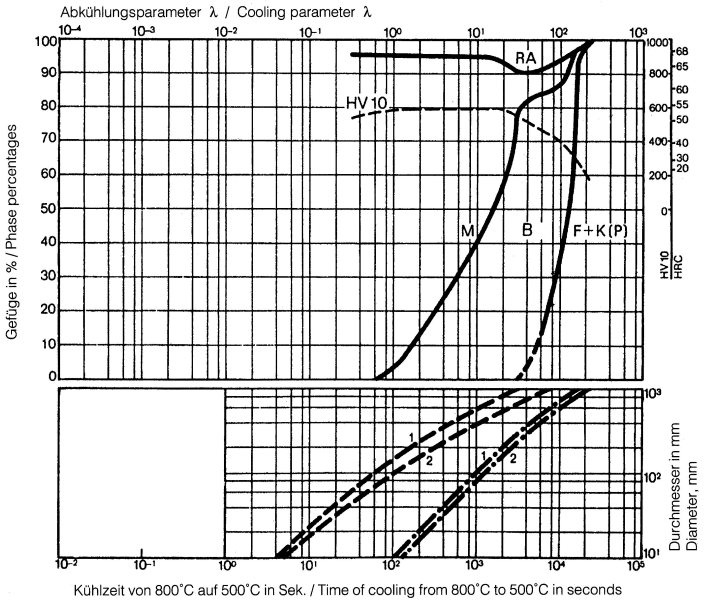
Continuous cooling CCT curves



Austenitising temperature: 1020°C (1868°F)
Holding time: 15 minutes

O Vickers hardness
1...35 phase percentages
0.4...18 cooling parameter, i.e. duration of cooling from 800 - 500°C (1472-932°F) in s x 10^{-2}
5...1 K/min cooling rate in K/min in the 800 - 500°C (1472-932°F) range

Quantitative phase diagram

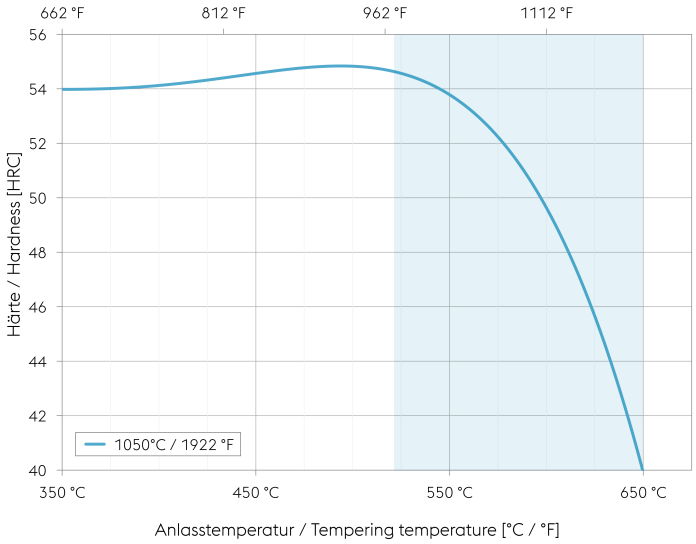


B... Bainite
F... Ferrite
K... Carbide
M... Martensite
P... Perlite
RA...Retained austenite

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

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

Tempering chart



Tempering:

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. It is recommended to temper at least twice.

A third tempering cycle for the purpose of stress relieving may be advantageous.

1st tempering approx. 86°F (30°C) above maximum secondary hardness.

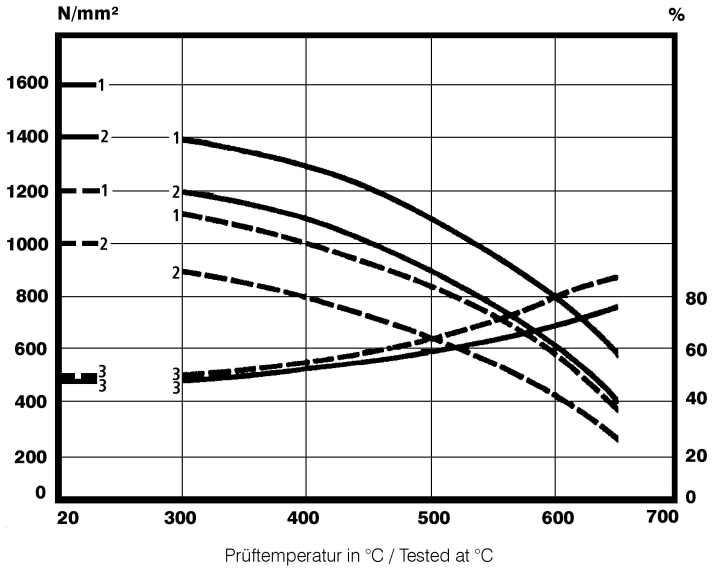
2nd tempering to desired working hardness. The tempering chart shows average tempered hardness values.

3rd for stress relieving at a temperature 86 to 122 °F (30 to 50°C) below highest tempering temperature.

Recommended tempering temperature range is indicated by the blue area in the chart.

Hardening temperature: 1050°C (1922°F)
Specimen size: square 50 mm

Hot strength chart



——— heat treated 1600 N/mm²
- - - - - - heat treated 1200 N/mm²
1... Tensile strength N/mm²
2... 0.2% proof stress N/mm²
3... Reduction of area %

Fizička svojstva

Temperatura (°C)	20
Gustoća (kg/dm³)	7,8
Toplinska vodljivost (W/(m.K))	24,3
Specifični toplinski kapacitet (kJ/kg K)	0,46
Spec. Otpornik (Ohm.mm²/m)	0,52
Modul elastičnosti (10³N/mm²)	215

Toplinska ekspanzija

Temperatura (°C)	100	200	300	400	500	600	700
Toplinska ekspanzija (10⁻⁶ m/(m.K))	11,5	12	12,2	12,5	12,9	13	13,2

Long Products: For additional specifications and technical requirements, please contact our regional voestalpine BÖHLER sales companies.

Open Die Forgings: Product Variant may differ in terms of melting process, technical data, delivery, and surface condition as well as available product dimensions. Please contact the business unit Open Die Forgings of voestalpine BÖHLER Edelstahl GmbH & Co KG.

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voestalpine
ONE STEP AHEAD.