BÖHLER

BÖHLER W320 ISODISC®

WARMWERKSTAAL

Beschikbare uitvoeringen

Stafstaal

Product omschrijving

Hoogbelaste warmwerkgereedschappen, vooral voor de bewerking van legeringen van zware metalen, zoals persdoornen, persmatrijzen en blokrecipiënten voor persen van metalen buizen en extruderpersen, gereedschap voor warme extrusie, gereedschap voor de productie van holle voorwerpen, gereedschap voor de productie van schroeven, moeren, nieten en bouten. Gereedschappen voor drukgieten, mallen voor vervormingspersen, inzetstukken voor mallen, warmschaarmessen, kunststofmatrijzen.

Smeltroute

Airmelted

Eigenschappen

- Taaiheid & Vervormbaarheid : goed
- Slijtageweerstand : hoog
- Bewerkbaarheid : zeer hoog
- Hete hardheid (rode hardheid) : hoog
- Polijstbaarheid : goed
- Microzuiverheid : goed
- Warmtegeleidingsvermogen : zeer hoog

Toepassingen

- Extrusie
- Spuitgieten
- Smeedwerk (warm / halfwarm)
- Progressief smeedwerk (Hatebur)
- Zwaartekrachtgieten / lagedrukgieten

Technische gegevens

Materiaal aanduiding	
1.2365	SEL
~T20810	UNS
32CrMoV12-28	EN
~H10	AISI
SKD7	JIS

Normen	
4957	EN ISO
G4404	JIS

Chemische samenstelling

C	Si	Mn	Cr	Mo	V
0,31	0,30	0,35	2,90	2,70	0,50

Materiaaleigenschappen

	Hete kracht	Hete taaiheid	Weerstand tegen hete slijtage
BÖHLER W320 ISODISC®	★★★	★★	★★★
BÖHLER W300 ISODISC®	★★	★★★	★★
BÖHLER W300 ISOBLOC®	★★	★★★★	★★
BÖHLER W302 ISODISC®	★★★	★★★	★★★
BÖHLER W302 ISOBLOC®	★★★	★★★★	★★★
BÖHLER W303 ISODISC®	★★★★	★★★	★★★★
BÖHLER W350 ISOBLOC®	★★★	★★★★★	★★★
BÖHLER W360 ISOBLOC®	★★★★★	★★★★	★★★★★
BÖHLER W400 VMR®	★★	★★★★★	★★
BÖHLER W403 VMR®	★★★★	★★★★	★★★★

Leveringsconditie

gegloeid

Hardheid (HB)	max. 229

Warmtebehandeling

Annealing

Temperatuur	750 naar 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.

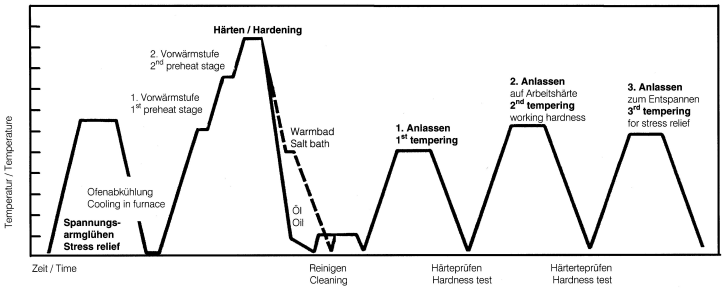
Stress relieving

Temperatuur	600 naar 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.

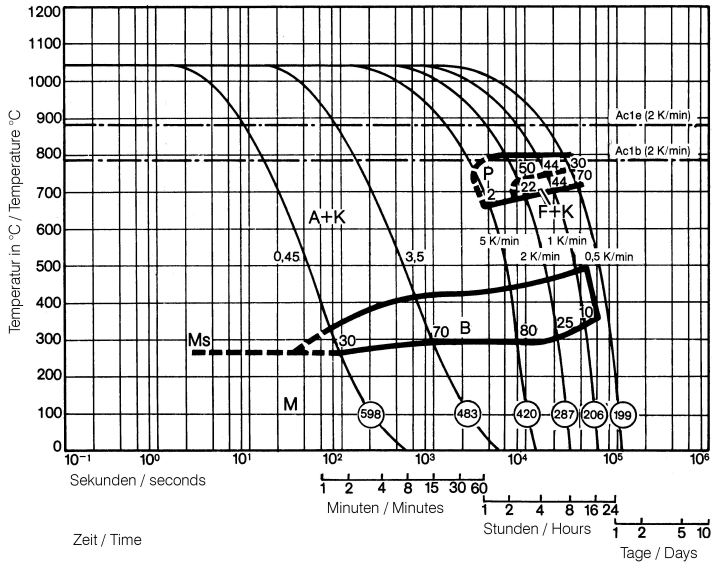
Harden en ontlaten

Temperatuur	1.010 naar 1.050 °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



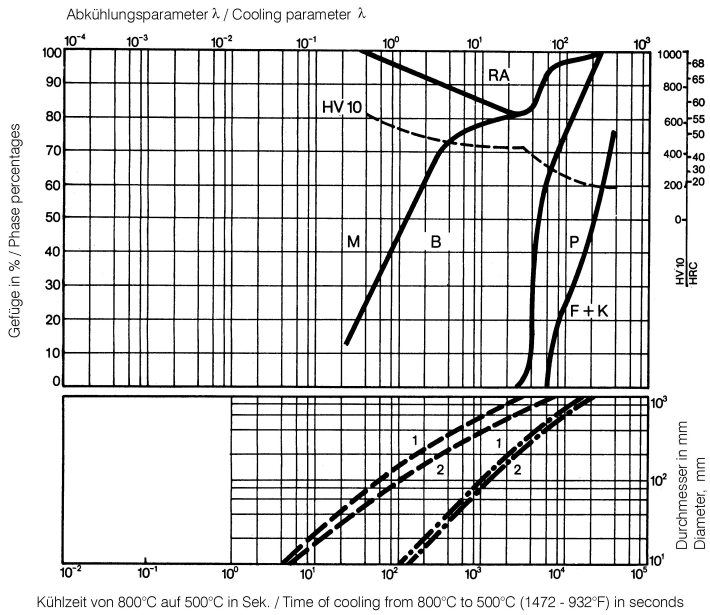
Continuous cooling CCT curves



Austenitising temperature: 1886°F (1030°C)
Holding time: 15 minutes

O Vickers hardness
2...80 phase percentages
0.45...3.5 cooling parameter, i.e. duration of cooling from 1472-932°F (800 - 500°C) in s x 10^{-2}
41...32,9°F/min (5...0.5 K/min) cooling rate in °F/min (K/min) in the 1472-932°F (800 - 500°C) range

Quantitative phase diagram

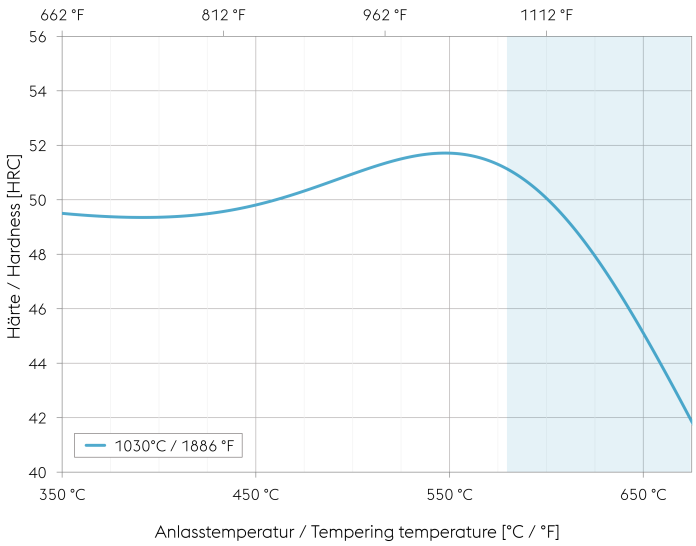


A... Austenite
B... Bainite
F... Ferrite
K... Carbide
M... Martensite
P... Perlite
RA... Retained austenite

- - - - - - 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 work piece 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. 30°C (86°F) above maximum secondary hardness.

2nd tempering to desired working hardness.

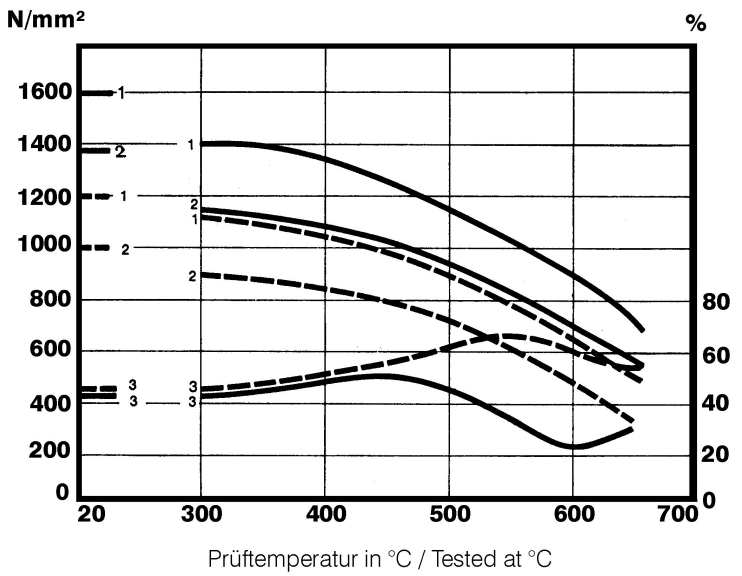
The tempering chart shows average tempered hardness values.

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

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

Hardening temperature: 1030°C (1886°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 %

Fysische eigenschappen

Temperatuur (°C)	20
Soortelijk gewicht (kg/dm³)	7,9
Thermische conductiviteit (W/(m.K))	30
Soortelijke warmte (kJ/kg K)	0,46
Specifieke elektrische weerstand (Ohm.mm²/m)	0,37
Elasticiteitsmodus (10³N/mm²)	215

Thermische expansie

Temperatuur (°C)	100	200	300	400	500	600	700
Thermische expansie (10^{-6} m/(m.K))	12	12,5	12,7	13	13,2	13,4	13,7

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

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.

voestalpine BÖHLER Edelstahl GmbH & Co KG
Mariazeller Straße 25
8605 Kapfenberg, AT
T. +43/50304/20-0
E. info@bohler-edelstahl.at
https://www.voestalpine.com/bohler-edelstahl/de/

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ONE STEP AHEAD.