BÖHLER

BÖHLER W350 ISOBLOC®

ŽIARUVZDORNÉ NÁSTROJOVÉ OCELE

Dostupné výrobné profily

Tyčové polotovary* | Plechy | Voľne kované výkovky

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

Popis produktu

BÖHLER W350 ISOBLOC - Oceľ pre prácu za tepla s vynikajúcou húževnatosťou a medzou pevnosti aj pre nižšie rýchlosti ochladzovania (pri kalení), s vysokou odolnosťou proti opotrebovaniu pri vyšších teplotách.

Spôsob výroby

Konvenčná výroba + Pretavovanie

Vlastnosti

- Húževnatosť a odolnosť proti plastickej deformácii : veľmi vysoká
- Odolnosť proti opotrebovaniu : vysoká
- Obrobiteľnosť : veľmi vysoká
- Zachovanie tvrdosti pri vyšších teplotách : vysoká
- Leštiteľnosť : veľmi vysoká
- Tepelná vodivosť : veľmi vysoká
- Mikročistota : vysoká

Aplikácia

- Vysokotlakové odlievanie
- Diely pre všeobecné strojárstvo
- Extrúzia
- Kovanie (za tepla /poloohrevu)
- Vstrekovanie plastov
- Rýchlokovanie (Hatebur)
- Gravitačné / Nízkotlakové liatie
- Lisovanie za tepla
- Všeobecné strojárstvo

Technické údaje

Označenie materiálu	
BÖHLER patent	Market grade
E1850	NADCA

Normy	
#207	NADCA

Chemické zloženie

C	Si	Mn	Cr	Mo	V	N
0,38	0,20	0,55	5,00	1,80	0,55	def.

Porovnanie vlastnosti materiálu

	Pevnosť pri vyšších teplotách	Húževnatosť pri vyšších teplotách	Odolnosť proti opotrebovaniu za tepla
BÖHLER W350 ISOBLOC®	★★★	★★★★★	★★★
BÖHLER W300 ISOBLOC®	★★	★★★★	★★
BÖHLER W300 ISODISC®	★★	★★★	★★
BÖHLER W302 ISOBLOC®	★★★	★★★★	★★★
BÖHLER W302 ISODISC®	★★★	★★★	★★★
BÖHLER W303 ISODISC®	★★★★	★★★	★★★★
BÖHLER W320 ISODISC®	★★★	★★	★★★
BÖHLER W360 ISOBLOC®	★★★★★	★★★★	★★★★★
BÖHLER W400 VMR®	★★	★★★★★	★★
BÖHLER W403 VMR®	★★★★	★★★★	★★★★

Stav pri dodaní

Žíhaný

Tvrdosť (HB)	max. 205

Tepelné spracovanie

Žíhanie

Teplota	750 až 800 °C	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (50 to 68 °F/hr) down to approx. 600 °C (112 °F), further cooling in air.

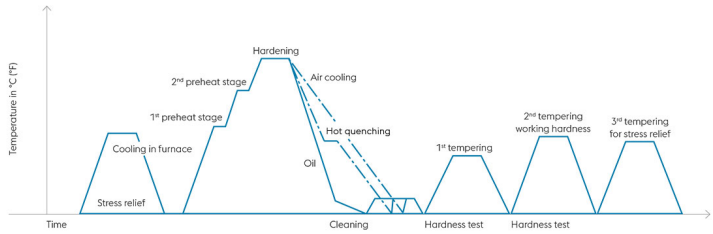
Žíhanie na odstránenie pnutí

Teplota	600 až 670 °C	Slow cooling furnace. To relieve stresses caused by extensive machining, or for complex shapes. Soak for 1 -2 hours after temperature equalisation (in neutral atmosphere).

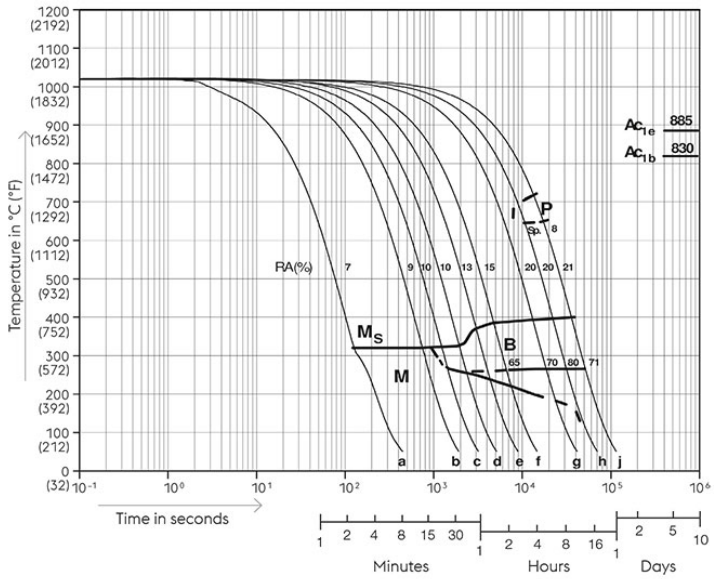
Kalenie a popúšťanie

Teplota	1 010 až 1 020 °C	Holding time after temperature equalization: 15 to 30 minutes; In order to prevent coarsening of the grain, hardening must be carried out at the recommended temperature. For big dimensions it's recommended to reduce the temperature to 1010 °C (1850 °F); Quenching: oil, salt bath (500 - 550°C [932 - 1022 °F]), air, inert gas in vacuum; After hardening, required tempering treatment to achieve desired working hardness (see tempering chart).

Heat treatment sequence



Continuous cooling CCT curves

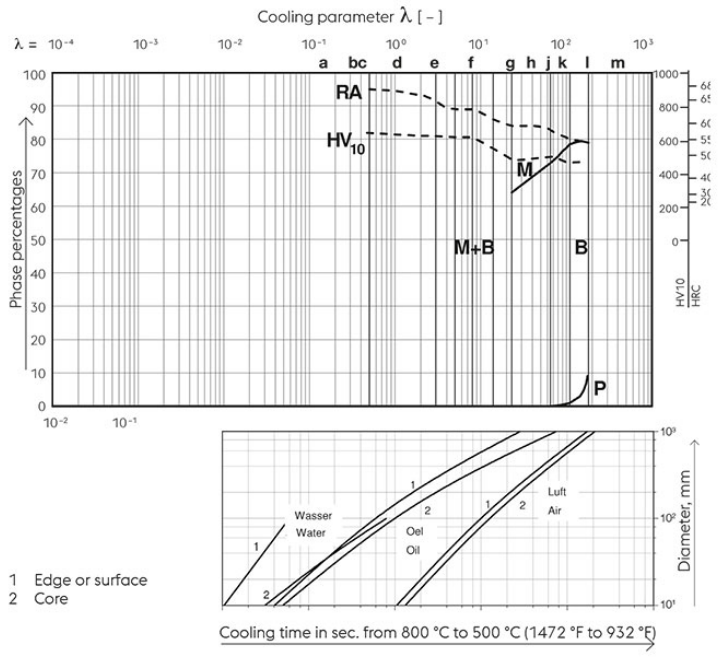


Austenitising temperature: 1020°C (1868°F)
Holding time: 15 minutes
5...100 phase percentages
0.5...180 cooling parameter, i.e. duration of cooling from 800 - 500°C (1472-932°F) in s x 10^{-2}

Table:

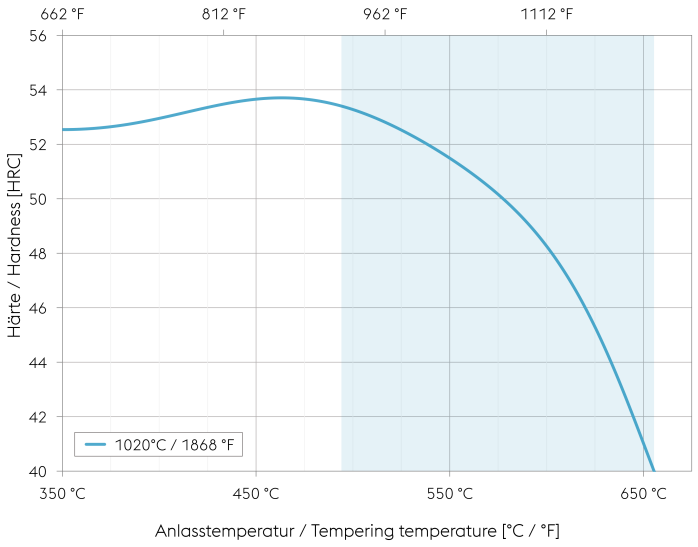
Sample	λ	HV10	Sample	λ	HV10
a	0,5	630	f	23	478
b	3	616	g	65	497
c	5	606	h	110	454
d	8	606	j	180	459
e	14	517			

Quantitative phase diagram



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

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: 1020°C (1868°F)
Specimen size: square 20 mm

Fyzikálne vlastnosti

Teplota (°C)	20
Hustota (kg/dm^3)	7,8
Tepelná vodivosť (W/(m.K))	28,8
Merná tepelná kapacita (kJ/kg K)	0,46
Merný elektrický odpor (Ohm.mm^2/m)	-
Modul pružnosti (10^{3}N/mm^2)	214

Tepelná rozťažnosť

Teplota (°C)	100	200	300	400	500	600	700
Tepelná rozťažnosť (10^{-6} m/(m.K))	11,1	11,9	12,4	12,9	13,2	13,5	13,6

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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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.