

NÍSTROJOVÉ OCELI PRO PRÁCI ZA TEPLA

Rozměrový sortiment k dispozici

Tyčová ocel*

Plech

Volné výkovky

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

Popis produktu

BÖHLER W350 ISOBLOC - ocel pro práci za tepla s vysokou houževnatostí a pevností i při nižší rychlosti ochlazování při kalení. Ocel byla vyvinuta speciálně pro výrobu velkých forem pro tlakové lití.

Trasa tavení

Airmelted + Remelted

Vlastnosti

- > Houževnatost a tažnost : velmi vysoká
- > Odolnost proti opotřebení : vysoká
- > Obrobitelnost : velmi vysoká
- > Tvrdost za tepla (červená tvrdost) : vysoká
- > Leštitelnost : velmi vysoká
- > Tepelná vodivost : velmi vysoká
- > Mikročistota : vysoká

Použití

- > Protlačování
- > Nízkotlaké lití
- > Poloteplé lisování
- > Kování
- > Tlakové lití
- > Rychlokovací kování
- > Všeobecné díly pro strojírenství
- > Vstřikování plastů
- > Strojírenství











Technické údaje

Označení materiálu		Normy	
BÖHLER patent	Market grade	#207	NADCA
E1850	NADCA		

Chemické složení

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

Materiálové vlastnosti

	Síla za horka	Horká houevnatost	Odolnost proti opot?ebení za tepla
	★★★	★★★★★	★★★
	★★	★★★★	★★
	★★	★★★	★★
	★★★	★★★★	★★★
	★★★	★★★	★★★
	★★★★★	★★★	★★★★★
	★★★	★★	★★★
	★★★★★	★★★★	★★★★★
	★★	★★★★★	★★
	★★★★	★★★★	★★★★

Stav dodání

Žiháno

Tvrlost (HB)	max. 205
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Tepelné zpracování

Annealing

Teplota	800 na 850 °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.
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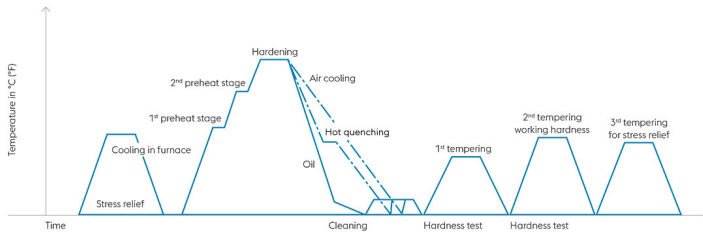
Žihání na odstranění vnitřního pnutí

Teplota	600 na 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).
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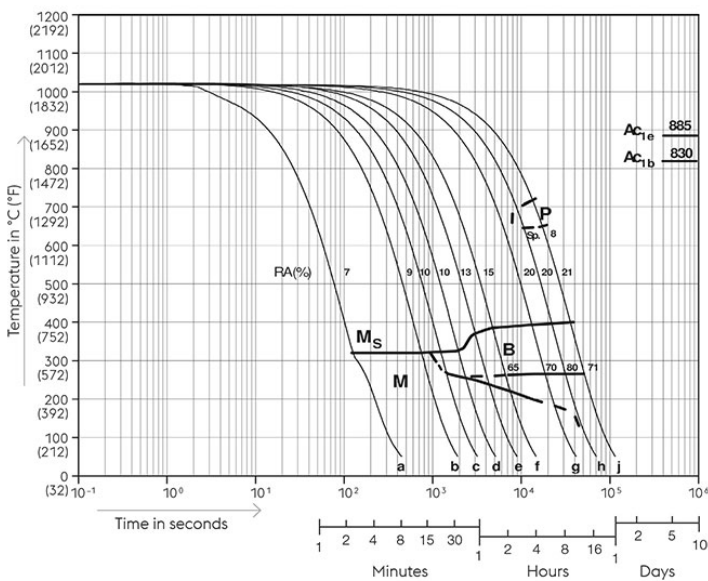
Kalení a popouštění

Teplota	1 010 na 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).
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Heat treatment sequence



Continuous cooling CCT curves

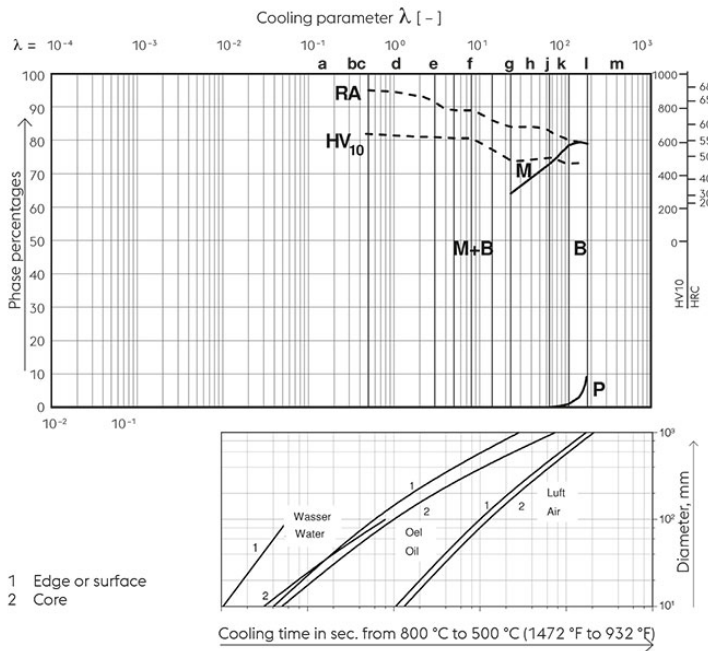


Austenitising temperature: 1020°C (1868°F)
 Holding time: 15 minutes
 5...100 phase percentages
 0.5...180 cooling parameter, i.e. duration of cooling
 from 800 - 500°C (1472-932°F) in $s \times 10^{-2}$

Table:
 Sample λ HV10

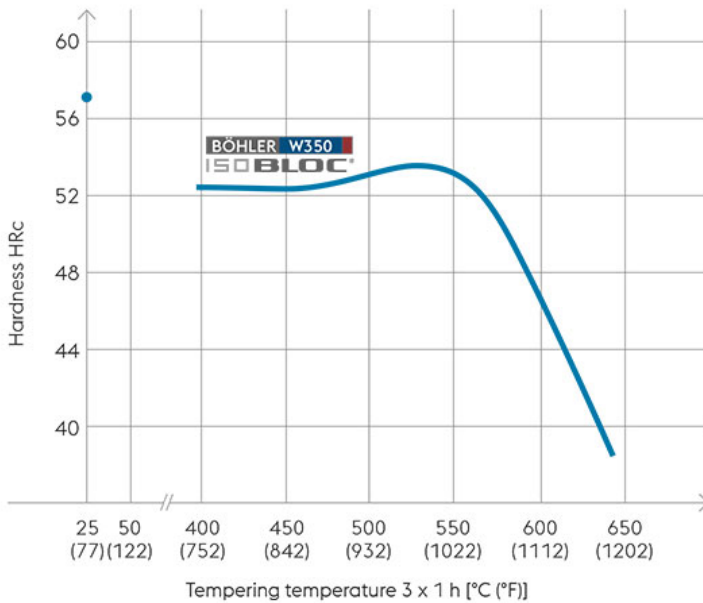
a	0,50	630
b	3	616
c	5	606
d	8	606
e	14	517
f	23	478
g	65	497
h	110	454
j	180	459

Quantitative phase diagram



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

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

Fyzikální vlastnosti

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

Tepelná roztažnost

Teplota (°C)	100	200	300	400	500	600	700
Tepelná roztažnost (10 ⁻⁶ m/(m.K))	11,14	11,94	12,42	12,85	13,21	13,51	13,58

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

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