

SICAK İŞ TAKIM ÇELİKLERİ

Mevcut Ürün Şekilleri

Uzun Ürünler*

Levhalar

Açık Kalıpta Dövme

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

Ürün Tanımı

BÖHLER W300 ISOBLOC is a 5% chromium steel and corresponds to material number 1.2343 (X37CrMoV5-1). Produced via the electroslag remelting process (ESR), this tool steel has very high hot toughness as well as good hot hardness and very good resistance against heat-checkings. The combination of these properties makes it a top performer in high- and low-pressure die casting as well as in closed-die and open-die forging. In addition, this material has very good polishability and is therefore also often used as a molding material for plastic injection molds.

Erime rotası

Airmelted + Remelted

Özellikler

- > Tokluk ve Süneklik : yüksek
- > Aşınma Direnci : iyi
- > İşlenebilirlik : çok yüksek
- > Sıcak Sertlik (kırmızı sertlik) : iyi
- > Cilalanabilirlik : çok yüksek
- > Termal iletkenlik : yüksek
- > Mikro temizlik : yüksek

Uygulamalar

- > Yüksek Basınçlı Döküm
- > Yerçekimi / Düşük Basınçlı Döküm
- > Tespit Elemanları, Cıvatalar ve Somunlar
- > Pres Sertleştirme / Sıcak Damgalama
- > Takım Tutucular (frezeleme, delme, tornalama & Aynalar)
- > Screws and Barrels
- > Glasfibre reinforced plastics
- > Dövme Uygulamaları
- > Progressive Forging (Hatebur)
- > Makine Mühendisliği için Genel Parçalar
- > Rolling
- > Fine Blanking, Stamping, Blanking
- > Haddeler
- > Dövme (Sıcak / Yarı Sıcak)
- > Ekstrüzyon
- > Enjeksiyon kalıplama
- > Shearing / Machine Knives
- > Standard Parts (Molds, Plates, Pins, Punches)
- > Hotrunner systems

Teknik veriler

Malzeme Tanımı		Standartlar	
1.2343	SEL	4957	EN ISO
X37CrMoV5-1	EN	G4404	JIS
T20811	UNS	#207	NADCA
H11	AISI		
SKD6	JIS		
D1830	NADCA		

Kimyasal Bileşim

C	Si	Mn	Cr	Mo	V
0,38	0,90	0,40	5,20	1,30	0,45

Malzeme özellikleri

	Sıcak güç	Sıcak tokluk	Sıcak aşınma direnci
	★★	★★★★★	★★
	★★	★★★	★★
	★★★	★★★	★★★
	★★★	★★★★★	★★★
	★★★★★	★★★	★★★★★
	★★★	★★★★★	★★★
	★★★★★	★★★★★	★★★★★
	★★	★★★★★	★★
	★★★★★	★★★★★	★★★★★

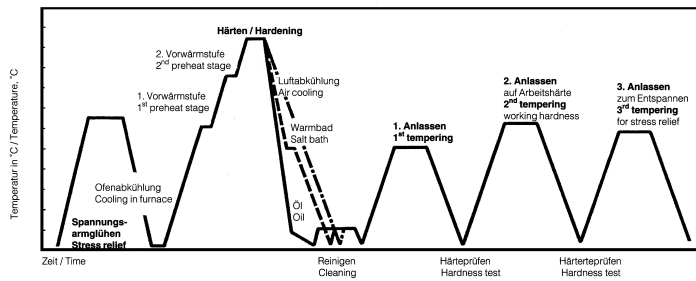
Teslimat durumu

Annealed	
Sertlik (HB)	maks. 229
Hardened and Tempered	
Sertlik (HRC)	40 kadar 55 bars hardened and tempered (BHT)
Hardened and Tempered	
Sertlik (HRC)	30 kadar 44

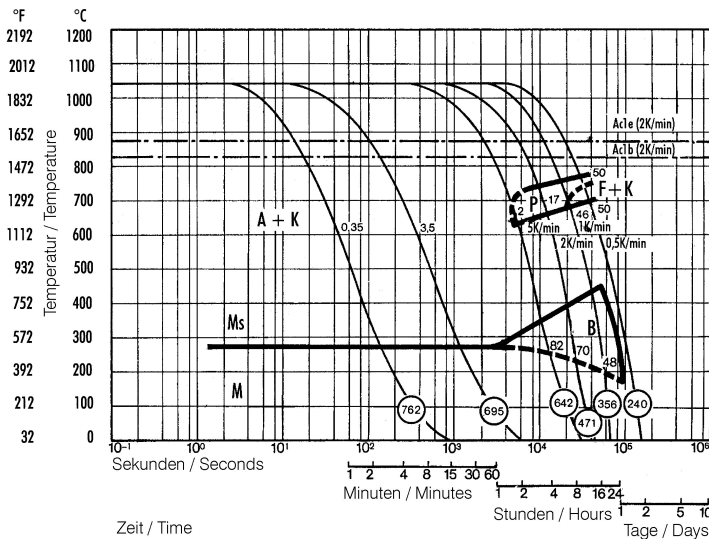
Isıl İşlem

Annealing		
Sıcaklık	750 kadar 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		
Sıcaklık	600 kadar 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.
Sertleştirme ve Temperleme		
Sıcaklık	1.000 kadar 1.030 °C	(Die casting equipment: 1000 - 1010 °C [1832 - 1850°F]) 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

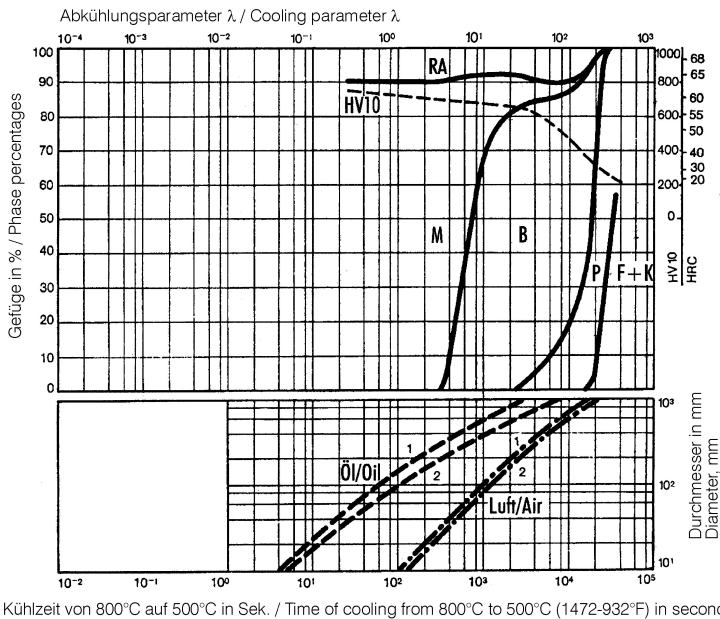


Austenitising temperature: 1030°C (1886°F)
Holding time: 15 minutes

O Vickers hardness
2...46 phase percentages
0.35...3.5 cooling parameter, i.e. duration of cooling from 800 - 500°C (1472-932°F) in $s \times 10^{-2}$
5...0.5 K/min cooling rate in K/min in the 800 - 500°C (1472-932°F) range

Numbers in circles = Vickers hardness

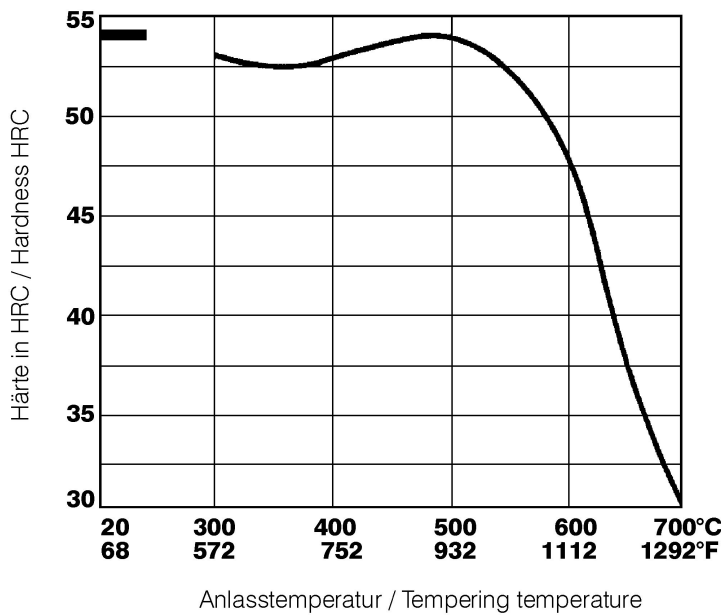
Quantitative phase diagram



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

- 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.

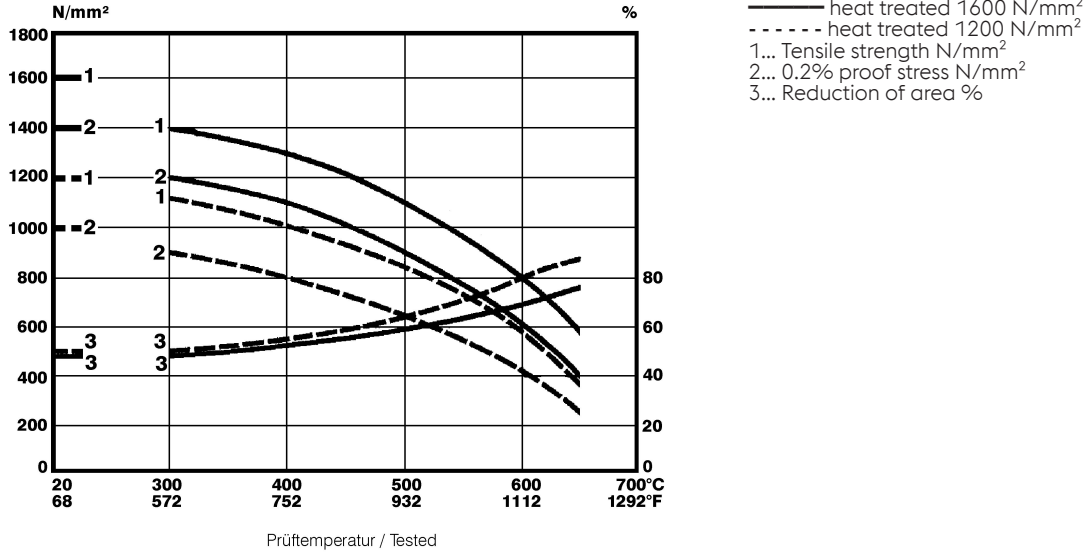
2nd tempering to desired working hardness.

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.

Hardening temperature: 1020°C (1868°F)
Specimen size: square 50 mm

Hot strength chart



Fiziksel özellikler

Sıcaklık (°C)	20
Yoğunluk (kg/dm ³)	7,8
Termal iletkenlik (W/(m.K))	24,9
Özgül ısı kapasitesi (kJ/kg K)	0,46
Spes. elektrik direnci (Ohm.mm ² /m)	0,52
Elastikyet modülü (10 ³ N/mm ²)	211

Termal genleşmeler

Sıcaklık (°C)	100	200	300	400	500	600
Termal genleşme (10 ⁻⁶ m/(m.K))	10,38	10,72	11,86	12,61	13,25	13,64

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.

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.

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@boehler-edelstahl.at
<https://www.voestalpine.com/boehler-edelstahl/de/>

ONE STEP AHEAD.