

SICAK İŞ TAKIM ÇELİKLERİ

Mevcut Ürün Şekilleri

Uzun Ürünler*

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 W303 ISODISC is a 5% chromium steel and corresponds to material number 1.2367 (X38CrMoV5-3). This tool steel has good hot toughness as well as a very high hot hardness and resistance against heat-checkings. Compared to an X37CrMoV5-1 (material number 1.2343), the steel has an increased molybdenum content, which significantly increases its thermal resistance and thus makes it the ideal material in die closed-die forging, open-die forging and extrusion.

Erime rotası

Airmelted

Özellikler

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

Uygulamalar

- > Ekstrüzyon
- > Dövme (Sıcak / Yarı Sıcak)
- > Makine Mühendisliği için Genel Parçalar
- > Yerçekimi / Düşük Basıncı Döküm
- > Yüksek Basıncı Döküm
- > Pres Sertleştirme / Sıcak Damgalama
- > Progressive Forging (Hatebur)
- > Makine Mühendisliği / Makine İmalatı, Genel







Teknik veriler

Malzeme Tanımı	Standartlar
1.2367 SEL	4957 EN ISO
X38CrMoV5-3 EN	

Kimyasal Bileşim

C	Si	Mn	Cr	Mo	V
0,38	0,40	0,40	5,00	2,80	0,55

Malzeme özellikleri

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

Teslimat durumu

Annealed

Sertlik (HB)	maks. 229
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Hardened and Tempered

Sertlik (HRC)	30 kadar 44
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Isıl işlem

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.
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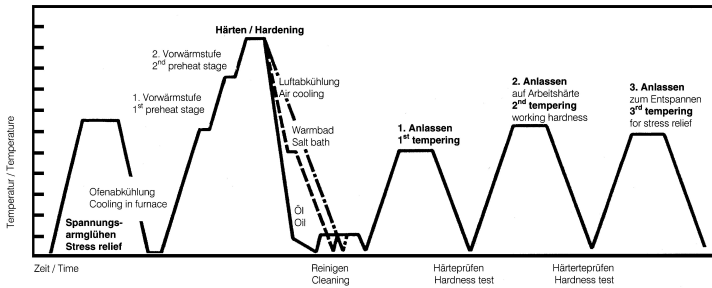
Stress relieving

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.
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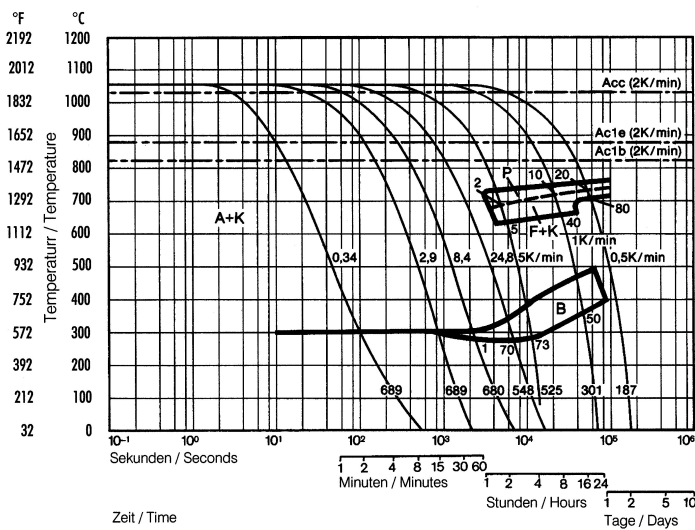
Sertleştirme ve Temperleme

Sıcaklık	1.030 kadar 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).
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Heat treatment sequence



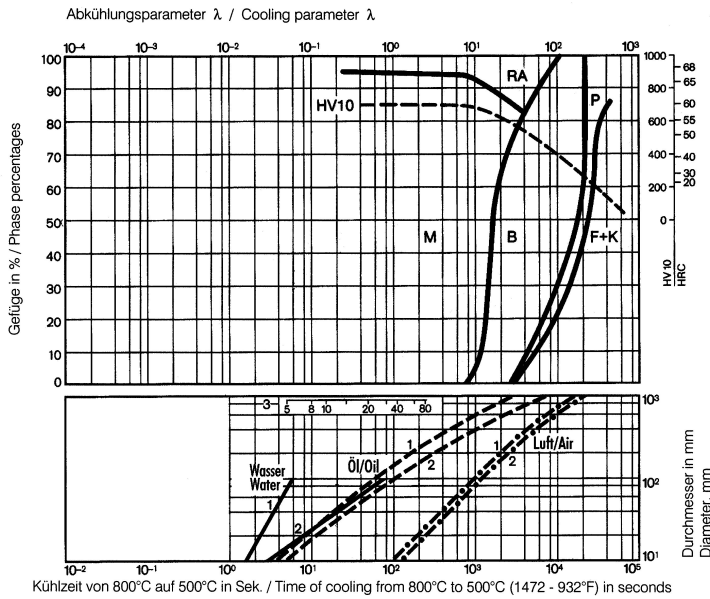
Continuous cooling CCT curves



Austenitising temperature: 1922°F (1050°C)
Holding time: 15 minutes

689 - 187 Vickers hardness
1...80 phase percentages
0.34...24.8 cooling parameter, i.e. duration of cooling from 1472 - 932°F (800-500°C) in $s \times 10^{-2}$
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

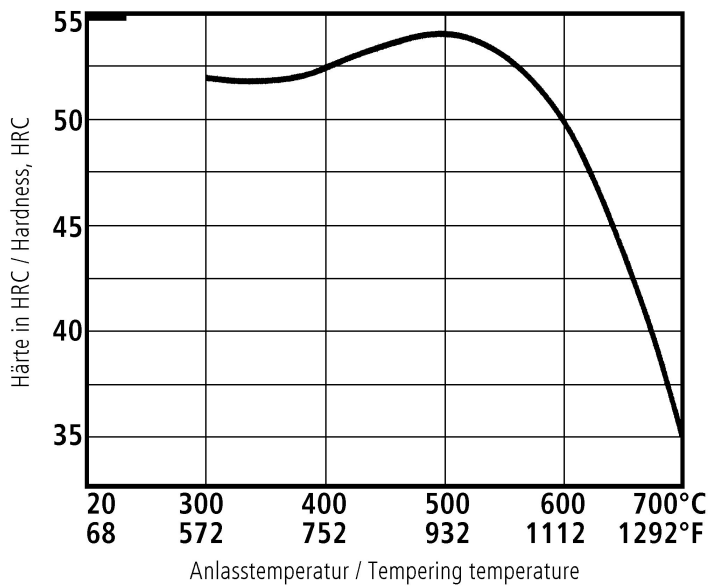


A... Austenite
B... Bainite
F... Ferrite
K... Carbide
M... Martensite
P... Perlite
RA... Retained austenite

----- Oil cooling
- · - Air cooling

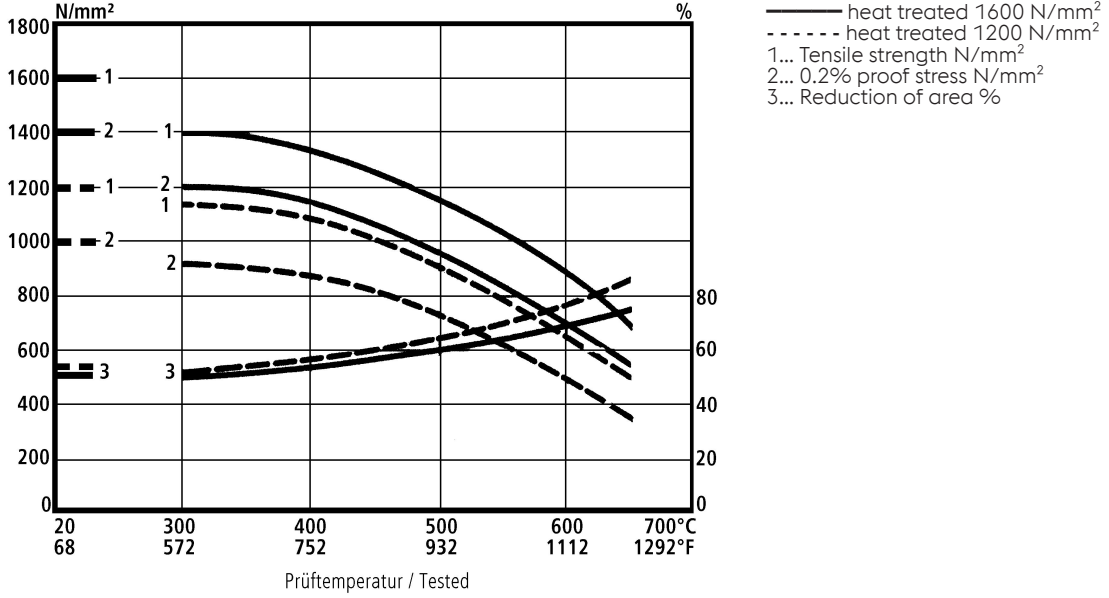
1... Edge or face
2... Core
3... Jominy test: distance from end

Tempering chart



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

Hot strength chart



Fiziksel özellikler

Sıcaklık (°C)	20
Yoğunluk (kg/dm ³)	7,85
Termal iletkenlik (W/(m.K))	-
Özgül ısı kapasitesi (kJ/kg K)	0,46
Spes. elektrik direnci (Ohm.mm ² /m)	0,5
Elastikiyet modülü (10 ³ N/mm ²)	215

Termal genleşmeler

Sıcaklık (°C)	100	200	300	400	500	600	700
Termal genleşme (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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ONE STEP AHEAD.