

# YÜKSEK HIZ ÇELİKLERİ

## Mevcut Ürün Şekilleri

[Uzun Ürünler\\*](#)[Levhalar](#)

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

## Ürün Tanımı

### BÖHLER S393 MICROCLEAN – "Standardized"

This grade complies with the ASTM A600 AISI T15 material standard. With MICROCLEAN technology, this material shows excellent reliability in many cutting and cold-work applications.

## Erime rotası

[Powder metallurgy](#)

## Özellikler

- > Tokluk ve Süneklik : yüksek
- > Aşınma Direnci : yüksek
- > Basınç Dayanımı : çok yüksek
- > Kenar Stabilitesi : çok yüksek
- > Öğütülebilirlik : yüksek
- > Sıcak Sertlik (kırmızı sertlik) : çok yüksek

## Uygulamalar

- > Broaches and Reamers
- > Fine Blanking, Stamping, Blanking
- > Rolling
- > Twist Drills and Taps
- > Cold Forming / Coining
- > Gear Cutting, Shaving and Shaping Tools
- > Shearing / Machine Knives
- > End Mills
- > Powder Pressing
- > Wear parts

## Teknik veriler

Malzeme Tanımı		Standartlar	
AISI: T15	AISI	A600	ASTM

## Kimyasal Bileşim

C	Cr	V	W	Co
1,63	4,0	4,75	12,10	5,0

## Malzeme özellikleri

	Basınç Dayanımı	Öğütülebilirlik	Sıcak sertlik	Sertlik	Aşınma direnci	Kesilme direnci
<b>BÖHLER S290</b> <b>MICROCLEAN</b>	★★★★★	★	★★★★★	★★	★★★★★	★★★★★
<b>BÖHLER S390</b> <b>MICROCLEAN</b>	★★★★★	★★★	★★★★★	★★★★★	★★★★★	★★★★★
<b>BÖHLER S590</b> <b>MICROCLEAN</b>	★★★★★	★★★	★★★★★	★★★	★★★	★★★
<b>BÖHLER S690</b> <b>MICROCLEAN</b>	★★★	★★★	★★	★★★★★	★★★	★★
<b>BÖHLER S790</b> <b>MICROCLEAN</b>	★★★	★★★	★★	★★★★★	★★	★★★
<b>BÖHLER S793</b> <b>MICROCLEAN</b>	★★★	★★★	★★★★★	★★★	★★★	★★★

## Teslimat durumu

### Annealed

Sertlik (HB)	maks. 300   drawn execution max. 320 HB
Çekme mukavemeti (N/mm <sup>2</sup> )	maks. 1.080

## Isıl işlem

### Annealing

Sıcaklık	870 kadar 900 °C	4 h    controlled slow cooling in furnace (10 - 20°C / (50 - 68°F) to 550°C / 2 h (1022°F / 2 h) cooling in furnace.
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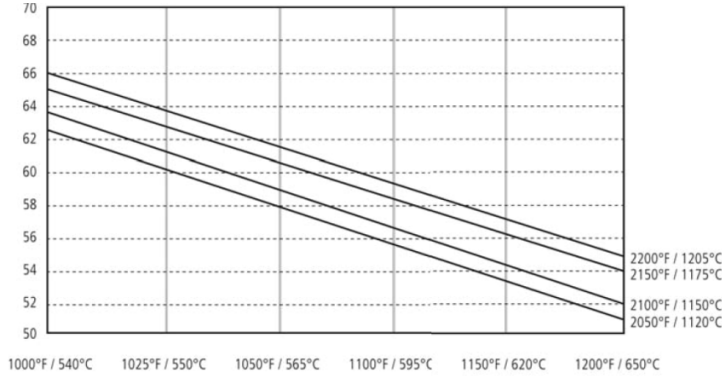
### Stress relieving

Sıcaklık	600 kadar 650 °C	Slow cooling furnace.    To relieve stresses set up by extensive machining or in tools of intricate shape.    After through heating, hold in neutral atmosphere for 1 to 2 hours.
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### Sertleştirme ve Temperleme

Sıcaklık	1.180 kadar 1.240 °C	Salt bath, vacuum    Preheating: 1st stage ~ 500 °C, 2nd stage ~ 850 °C, 3rd stage ~1050 °C    Austenitising: 1180 - 1240 °C, holding time after complete heating 80 seconds, maximum 150 seconds, to avoid material damage due to overheating.   Quenching: oil, warm bath (500 - 550 °C), gas
Sıcaklık	540 kadar 570 °C	Slow heating to tempering temperature immediately after austenitising.    Dwell time in the furnace 1 hour per 20 mm material thickness (at least 1 hour)    Slow cooling to room temperature between each tempering step    3 tempering cycles recommended    Hardness see tempering chart

## Tempering Chart



## Fiziksel özellikler

Sıcaklık (°C)	20
Yoğunluk (kg/dm <sup>3</sup> )	8,19
Termal iletkenlik (W/(m.K))	-
Özgül ısı kapasitesi (kJ/kg K)	-
Spes. elektrik direnci (Ohm.mm <sup>2</sup> /m)	-
Elastikiyet modülü (10 <sup>3</sup> N/mm <sup>2</sup> )	218

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**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.