

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 S690 MICROCLEAN – "The simple one"

The tough high-speed steel for challenging machining and cold forming.

Erime rotası

[Powder metallurgy](#)

Özellikler

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

Uygulamalar

- > Motor Sporları
- > End Mills
- > Special Cutting Tools
- > Broaches and Reamers
- > Fine Blanking, Stamping, Blanking
- > Cold Forming / Coining
- > Powder Pressing

Teknik veriler

Malzeme Tanımı	
M4	AISI
HS6-5-4	EN

Kimyasal Bileşim

C	Cr	Mo	V	W
1,44	4	5,2	4	5,6

Malzeme özellikleri

	Basınç Dayanımı	Öğütülebilirlik	Sıcak sertlik	Sertlik	Aşınma direnci	Kesilme direnci
BÖHLER S690 MICROCLEAN	★★★	★★★	★★	★★★★★	★★★	★★
BÖHLER S290 MICROCLEAN	★★★★★	★	★★★★	★★	★★★★★	★★★★
BÖHLER S390 MICROCLEAN	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
BÖHLER S393 MICROCLEAN	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
BÖHLER S590 MICROCLEAN	★★★★	★★★	★★★★	★★★	★★★	★★★
BÖHLER S790 MICROCLEAN	★★★	★★★	★★	★★★★	★★	★★★
BÖHLER S793 MICROCLEAN	★★★	★★★	★★★★	★★★	★★★	★★★

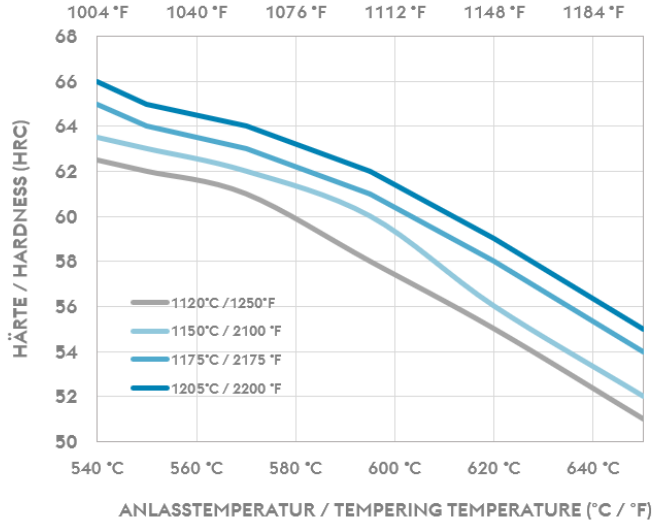
Teslimat durumu

Annealed	
Sertlik (HB)	maks. 280 drawn execution max. 300 HB
Çekme mukavemeti (N/mm ²)	maks. 1.020

Isıl işlem

Annealing		
Sıcaklık	870 kadar 900 °C	Slow cooling in furnace.
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.
Sertleştirme ve Temperleme		
Sıcaklık	1.100 kadar 1.220 °C	Salt bath, vacuum Preheating: 1st stage ~ 500 °C (930 °F), 2nd stage ~ 850 °C (1560 °F), 3rd stage ~1050 °C (1920 °F) Austenitising: 1100 - 1200 °C (2010 °F - 2230 °F), holding time after complete heating 80 seconds, maximum 150 seconds, to avoid material damage due to overheating. Quenching: oil, warm bath (500 - 550 °C (930 °F - 1020 °F)), gas
Sıcaklık	540 kadar 570 °C	Slow heating to tempering temperature immediately after austenitising. Holding 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 ³)	8,1
Termal iletkenlik (W/(m.K))	20
Özgül ısı kapasitesi (kJ/kg K)	0,46
Spes. elektrik direnci (Ohm.mm ² /m)	0,53
Elastikiyet modülü (10 ³ N/mm ²)	217

Termal genişlemeler

Sıcaklık (°C)	100	200	300	400	500	600	700
Termal genişleme (10 ⁻⁶ m/(m.K))	11,5	11,7	12,2	12,4	12,7	13	12,9

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

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.

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