

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 S290 MICROCLEAN – "The hard stuff"

The unusual alloy point of this bridge material between carbide and high-speed steel gives it a hardness of up to 70 HRC. In addition to its hot hardness and good wear resistance, its compressive strength is one of the most important properties of this powder-metallurgical high-speed steel class.

Erime rotası

[Powder metallurgy](#)

Özellikler

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

Uygulamalar

- > Cold Forming / Coining
- > Fine Blanking, Stamping, Blanking
- > Gear Cutting, Shaving and Shaping Tools
- > Powder Pressing
- > Special Cutting Tools
- > Wear parts

Kimyasal Bileşim

C	Cr	Mo	V	W	Co
2,0	3,8	2,5	5,1	14,3	11,0

Malzeme özellikleri

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

Teslimat durumu

Annealed

Sertlik (HB)	maks. 350
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Isıl işlem

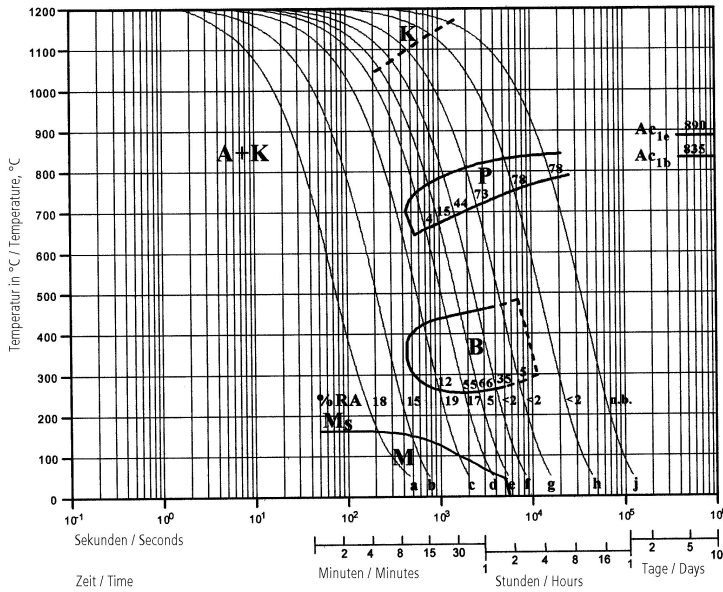
Stress relieving

Sıcaklık	600 kadar 650 °C	Slow cooling in 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	1.150 kadar 1.210 °C	Salt bath, vacuum Preheating: 1st stage ~ 500 °C (930 °F), 2nd stage ~ 850 °C (1560 °F), 3rd stage ~ 1050 °C (1920 °F) Austenitising: 1150 - 1210 °C (2100 °F - 2210 °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	550 kadar 580 °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

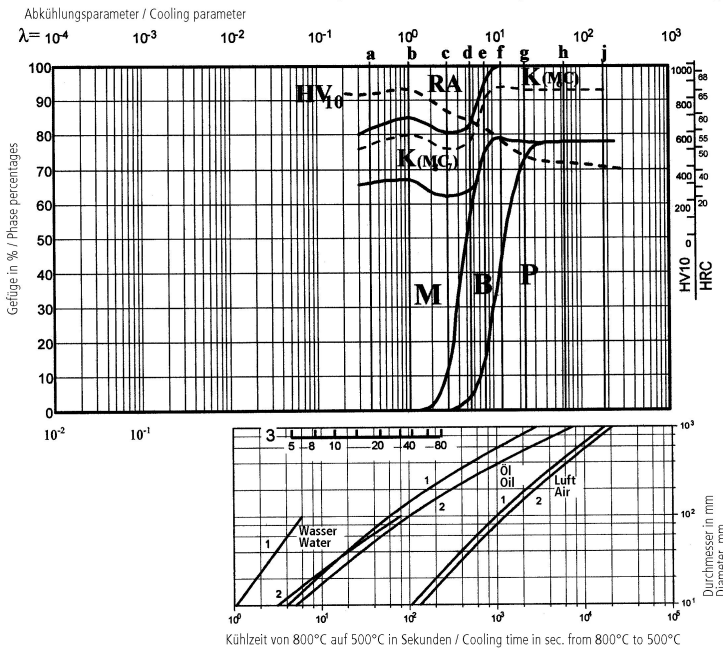
Continuous cooling CCT curves



Austenitising temperature: 1210°C (2210°F)
Holding time: 180 seconds

- A....Austenite
- B....Bainite
- K....Carbide
- P....Pearlite
- M....Martensite
- RA...Retained Austenite

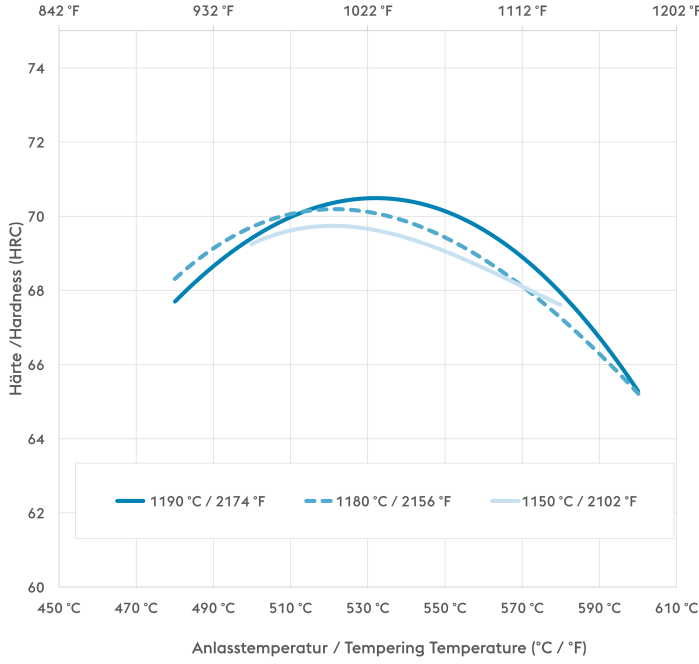
Quantitative phase diagram



- A....Austenite
- B....Bainite
- K....Carbide
- P....Pearlite
- M....Martensite
- RA...Retained Austenite

- 1....Edge or Face
- 2....Core
- 3....Jominy test: distance from quenched end

Tempering Chart



Fiziksel özellikler

Sıcaklık (°C)	20
Yoğunluk (kg/dm ³)	8,3
Termal iletkenlik (W/(m.K))	19
Özgü ısı kapasitesi (kJ/kg K)	0,41
Spes. elektrik direnci (Ohm.mm ² /m)	0,56
Elastikiyet modülü (10 ³ N/mm ²)	242

Termal genişmeler

Sıcaklık (°C)	100	200	300	400	500	600	700
Termal genişme (10 ⁻⁶ m/(m.K))	9,6	10	10,3	10,6	10,9	11,2	11,6

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

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