

# ACCIAI RAPIDI

## Granulometria disponibile

Prodotti lunghi\*

Lamiere

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

## Descrizione del prodotto

Questo materiale ponte tra metallo duro e acciaio rapido, grazie alla sua lega eccezionale, rivela una durezza fino a 70 HRC.

## Percorso di fusione

Powder metallurgy

## Proprietà

- > Durezza e duttilità : buono
- > Resistenza all'usura : molto alto
- > Resistenza alla compressione : molto alto
- > Stabilità dei bordi : molto alto
- > Macinabilità : buono
- > Durezza a caldo (durezza rossa) : molto alto

## Applicazioni

- > Coniatura / Formatura a freddo
- > Pressatura delle polveri
- > Tranciatura / Tranciatura fine / Stampaggio
- > Utensili speciali per lavorazioni con asportazione di truciolo
- > Utensili per lavorazioni di sgrossatura e sagomatura
- > Parti soggette a usura

## Analisi chimica

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

**Proprietà del materiale**

	Resistenza alla compressione	Macinabilità	Durezza a caldo	Tenacità	Resistenza all'usura	Resistenza al taglio
<b>BÖHLER S290</b> <b>MICROCLEAN®</b>	★★★★★	★	★★★★	★★	★★★★★	★★★★
<b>BÖHLER S390</b> <b>MICROCLEAN®</b>	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
<b>BÖHLER S393</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>	★★★	★★★	★★★★	★★★	★★★	★★★

**Condizioni di consegna**
**Ricotto**

Durezza (HB)	max. 350
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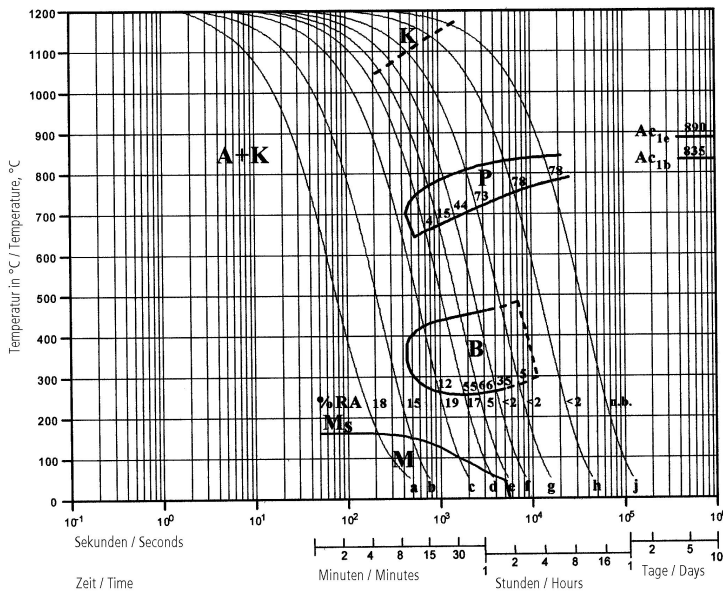
**Trattamento termico**
**Alleviare lo stress**

Temperatura	600 a 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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**Tempra e rinvenimento**

Temperatura	1.150 a 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
Temperatura	550 a 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

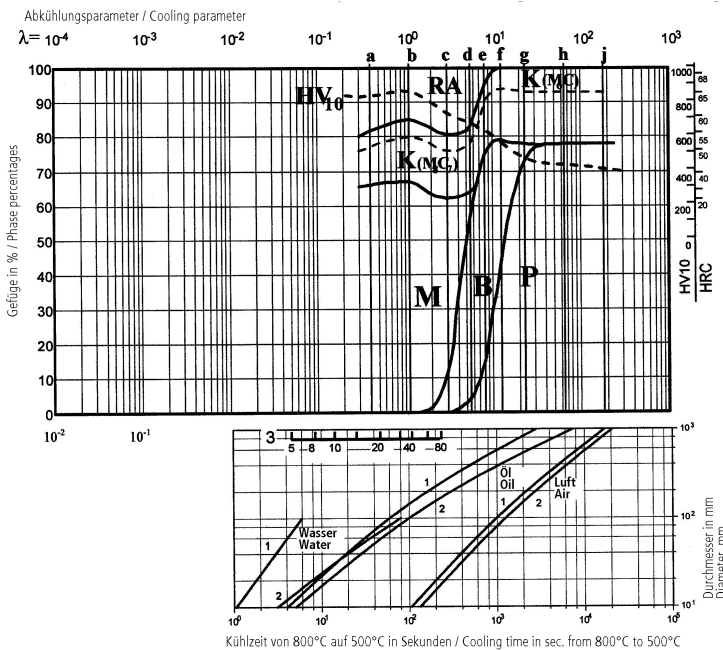
Continuous cooling CCT curves



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

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

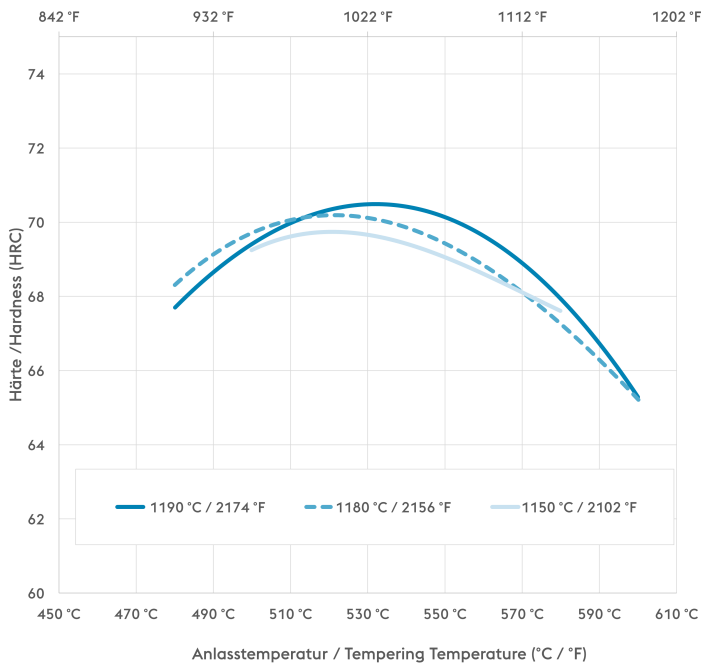
Quantitative phase diagram



- 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



Holdingtime 3x2 hours

Specimensize: square 25mm

### Proprietà fisiche

Temperatura (°C)	20
Densità (kg/dm <sup>3</sup> )	8,3
Conducibilità termica (W/(m.K))	19
Capacità termica specifica (kJ/kg K)	0,41
Resistenza elettrica specifica (Ohm.mm <sup>2</sup> /m)	0,56
Modulo di elasticità (10 <sup>3</sup> N/mm <sup>2</sup> )	242

## Espansioni termiche

Temperatura (°C)	100	200	300	400	500	600	700
Espansione termica (10 <sup>-6</sup> 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.

**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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