

ACEROS RÁPIDOS

Formatos disponibles

Productos largos*

Chapas

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

Descripción

BÖHLER S690 MICROCLEAN - "El simple"

El acero rápido tenaz para el mecanizado más exigente y conformado en frío.

Método de obtención

Pulvimetalurgia

Propiedades

- > Dureza y Ductilidad : muy alta
- > Resistencia al desgaste : buena
- > Resistencia a la compresión : buena
- > Estabilidad de los bordes : buena
- > Afilabilidad : alto
- > Dureza en caliente (dureza roja) : buena

Aplicaciones

- > Carreras automovilísticas
- > Broches y escariadores
- > Conformado en frío / acuñado
- > Puntas de brocas
- > Corte fino / Troquelado / Estampado
- > Compactación de polvo
- > Herramientas de corte especiales

Datos técnicos

Designación		
	~M4	AISI
	~HS6-5-4	EN

Composición Química

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

Características

	Resistencia a la compresión	Aptitud para el rectificado	Dureza en caliente	Tenacidad	Resistencia al desgaste	Retención del filo de la navaja
BÖHLER S690 MICROCLEAN®	★★★	★★★	★★	★★★★★	★★★	★★
BÖHLER S290 MICROCLEAN®	★★★★★	★	★★★★★	★★	★★★★★	★★★★★
BÖHLER S390 MICROCLEAN®	★★★★★	★★★	★★★★★	★★★★★	★★★★★	★★★★★
BÖHLER S393 MICROCLEAN®	★★★★★	★★★	★★★★★	★★★★★	★★★★★	★★★★★
BÖHLER S590 MICROCLEAN®	★★★★★	★★★	★★★★★	★★★	★★★	★★★
BÖHLER S592 MICROCLEAN®	★★★★★	★★★	★★★★★	★★★	★★★	★★★
BÖHLER S692 MICROCLEAN®	★★★	★★★	★★	★★★★★	★★★	★★
BÖHLER S790 MICROCLEAN®	★★★	★★★	★★	★★★★★	★★	★★★
BÖHLER S792 MICROCLEAN®	★★★	★★★	★★	★★★★★	★★	★★★
BÖHLER S793 MICROCLEAN®	★★★	★★★	★★★★★	★★★	★★★	★★★

Estado de suministro

recocido

Dureza (HB)	máx. 280 drawn execution max. 300 HB
Resistencia a la tracción (MPa)	máx. 1.020

Tratamiento térmico

Recocido

Temperatura	770 a 840 °C	Slow cooling in furnace.
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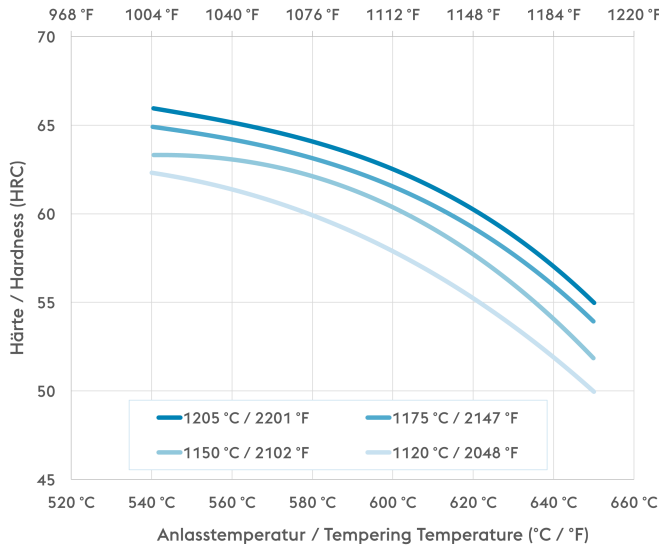
Alivio de tensiones

Temperatura	600 a 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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Temple y revenido

Temperatura	1.100 a 1.200 °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
Temperatura	540 a 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



Holding time 3 x 2 hours
Specimen size: square 25 mm

Tempering Chart

Propiedades físicas

Temperatura (°C)	20
Densidad (kg/dm ³)	8,1
Conductividad térmica (W/(m.K))	20
Calor específico (kJ/kg K)	0,46
Resistencia eléctrica específica (Ohm.mm ² /m)	0,53
Módulo de elasticidad (10 ³ N/mm ²)	217

Expansión térmica

Temperatura (°C)	100	200	300	400	500	600	700
Expansión térmica (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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voestalpine
ONE STEP AHEAD.