

# HIGH SPEED STEELS

## Available Product Shapes

- Long Products
- Plates

## Product Description

### 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.

## Properties

- > Toughness & Ductility: high
- > Wear Resistance: high
- > Compressive strength: very high
- > Edge Stability: very high
- > Grindability: high
- > Hot Hardness (red hardness): very high

## Applications

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

## Technical data

Material designation		Standards	
AISI: T15	AISI	A600	ASTM

## Chemical composition (wt. %)

C	Cr	V	W	Co
1.55	4.4	4.9	12.4	5

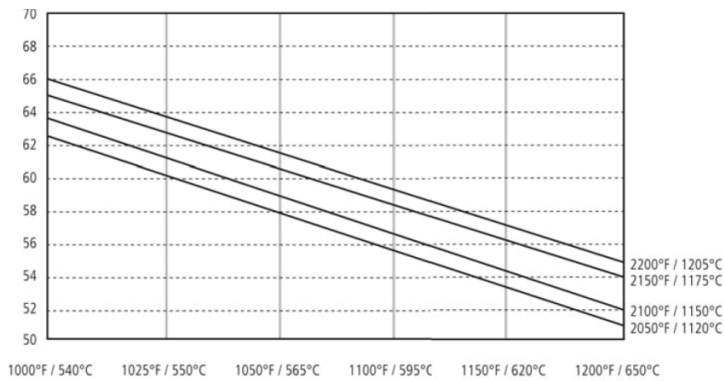
## Delivery condition

Annealed	
Hardness	max. 300 HB   drawn execution max. 320 HB
Tensile Strength	max. 1,080   156.635 N/mm <sup>2</sup>   KSI

## Heat treatment

Annealing		
Temperature (°C   °F)	860   1580 to 870   1598	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.
Stress relieving		
Temperature (°C   °F)	600   1112 to 650   1202	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.
Hardening and Tempering		
Temperature (°C   °F)	1180   2156 to 1240   2264	Oil, salt bath (500 - 550°C (932 - 1022°F) Vacuum

## Tempering Chart



## Physical Properties

Temperature (°C   °F)	20   68
Density (kg/dm <sup>3</sup>   lb/in <sup>3</sup> )	8.19   0.3
Thermal conductivity (W/(m.K)   BTU (IT) ft/hr/ft <sup>2</sup> /F)	-
Specific heat (J/(kg.K)   BTU (IT) lb/F)	-
Spec. electrical resistance (Ohm.mm <sup>2</sup> /m   10 <sup>-4</sup> Ohm.inch <sup>2</sup> /ft)	-
Modulus of elasticity (10 <sup>3</sup> N/mm <sup>2</sup>   10 <sup>3</sup> ksi)	218   31.62

For more information see [www.voestalpine.com/boehler-edelstahl](http://www.voestalpine.com/boehler-edelstahl)

The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

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