BÖHLER

BÖHLER S790 MICROCLEAN®

HIGH SPEED STEELS

Available Product Shapes

- Flat Bar
- Ground Flat
- Long Products
- Plates
- Round Bar
- Round Ground Bar

Product Description

BÖHLER S790 MICROCLEAN – "The 1st MICROCLEAN"

High-speed steel manufactured in a powder metallurgy process, with good hot hardness, compressive strength, and wear resistance. PM technology gives it good toughness and excellent workability, including the best machinability.

Properties

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

Applications

- Automotive Racing
- Powder Pressing
- Special Cutting Tools
- Broaches and Reamers
- Rolling
- Wear parts
- Cold Forming / Coining
- Shearing / Machine Knives

Technical data

Material designation	
1.3345	SEL
HS6-5-3C	EN

Standards	
4957	EN ISO

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	W
1.29	0.6	0.3	4.2	5	3	6.3

Delivery condition

Annealed	
Hardness	max. 280 HB | drawn max. 300 HB
Yield Strenght	max. 1,020 | 147.933 N/mm^2 | KSI

Heat treatment

Annealing

Temperature (°C | °F)	870 | 1598 to 900 | 1652	870 to 900°C (1598 to 1652°F) The steel needs to be protected against decarburi- zation. Through heating of the material is followed by controlled, slow furnace cooling at a maximum cooling rate of 10°C (50°F) per hour, down to ap- prox. 700°C (1292°F). Final cooling in air. Hardness after annealing: 280 Brinell, max.

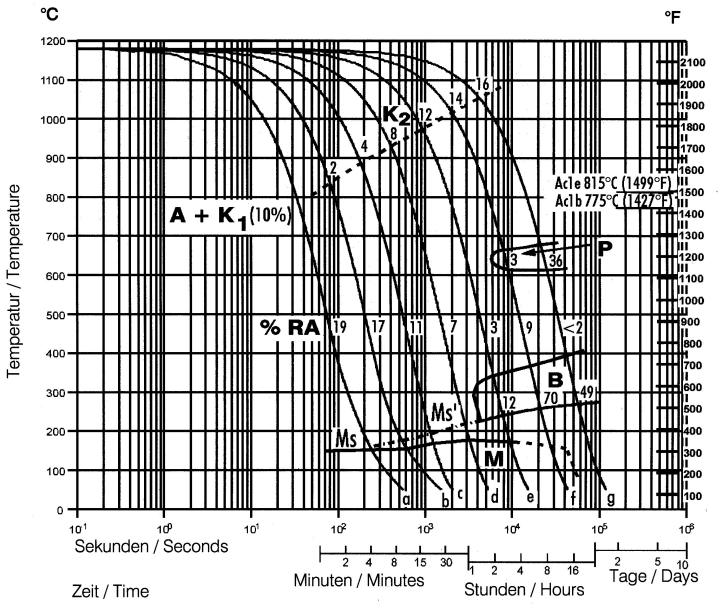
Stress relieving

Temperature (°C | °F)	600 | 1112 to 652 | 1205.6	Rough machining may cause stresses leading to dis- tortion during hardening. These stresses are relieved by heating to 600 to 650°C (1112 - 1202°F). Holding for 2 hours after through heating. Slow furnace cooling down to 500°C (932°F), followed by cooling in air.

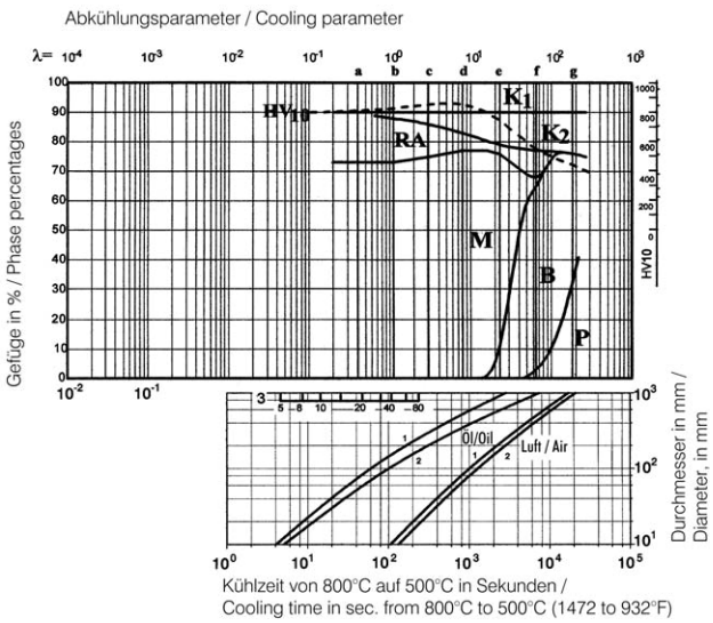
Hardening and Tempering

Temperature (°C | °F)	1050 | 1922 to 1180 | 2156	

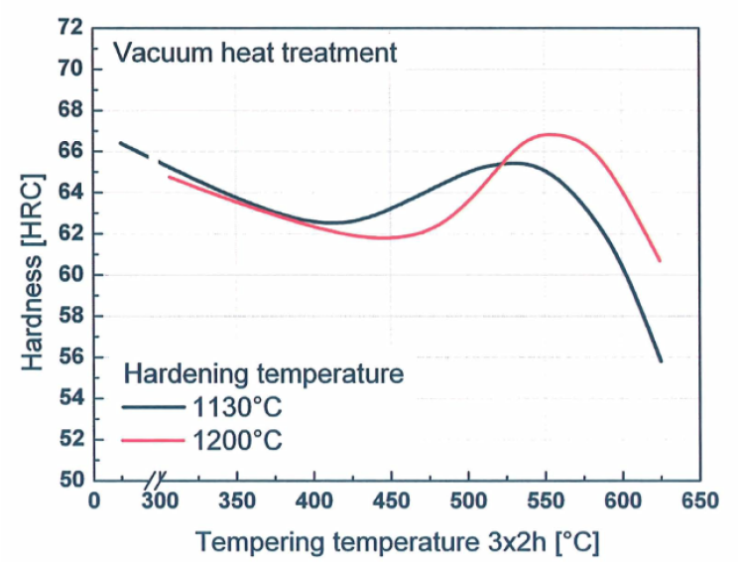
Continuous cooling CCT curves



Quantitative phase diagram



Tempering Chart



Physical Properties

Temperature (°C | °F)	20 | 68
Density (kg/dm^3 | lb/in^3)	8 | 0.29
Thermal conductivity (W/(m.K) | BTU (IT) ft/hr/ft^2/F)	24 | 13.87
Specific heat (J/(kg.K) | BTU (IT) lb/F)	420 | 100.32
Spec. electrical resistance (Ohm.mm^2/m | 10^{-4} Ohm.inch^2/ft)	0.54 | 2.55
Modulus of elasticity (10^3N/mm^2 | 10^3ksi)	230 | 33.36

Thermal Expansions

Temperature (°C | °F)	100 | 212	200 | 392	300 | 572	400 | 752	500 | 932	600 | 1112	700 | 1292
Thermal expansion (10^{-6} m/(m.K) | 10^{-6} inch/(inch.F))	11.5 | 6.389	11.7 | 6.5	12.2 | 6.778	12.4 | 6.889	12.7 | 7.056	13 | 7.222	12.9 | 7.167

For more information see www.voestalpine.com/bohler-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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voestalpine
ONE STEP AHEAD.