

# HIGH SPEED STEELS

## Application Segments

Cutting Tools

## Available Product Variants

Wire

## Product Description

BÖHLER S500SF is a conventional molybdenum-tungsten-vanadium high-speed steel alloyed with 8% cobalt. It offers a working hardness of approximately 68 HRC, excellent cutting performance, and very high hot hardness, making it ideal for temperature-stressed cutting applications and bimetal saw bands.  
Delivery Condition: rolled wire

## Process Melting

Airmelted

## Properties

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

## Applications

- > Special Cutting Tools

## Technical data

Material designation		Standards	
1.3247	SEL	4957	EN ISO
HS2-9-1-8	EN		

## Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	W	Co
1.1	0.3	0.3	3.8	9.5	1.2	1.5	8

Material characteristics

	Compressive strength	Grindability	Red hardness	Toughness	Wear resistance	Edge Stability
BÖHLER S500SF	★★★★	★★★	★★★★★	★★	★★★★★	★★★★★
BÖHLER S504SF	★★★	★★★★★	★★★	★★★	★★	★★★

Delivery condition

**Annealed**

Tensile Strength (MPa)	max. 950
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Heat treatment

**Annealing**

Temperature	770 to 840 °C	Controlled slow cooling in furnace (10 to 20°C / h) to approx. 600°C (1110°F), air cooling.
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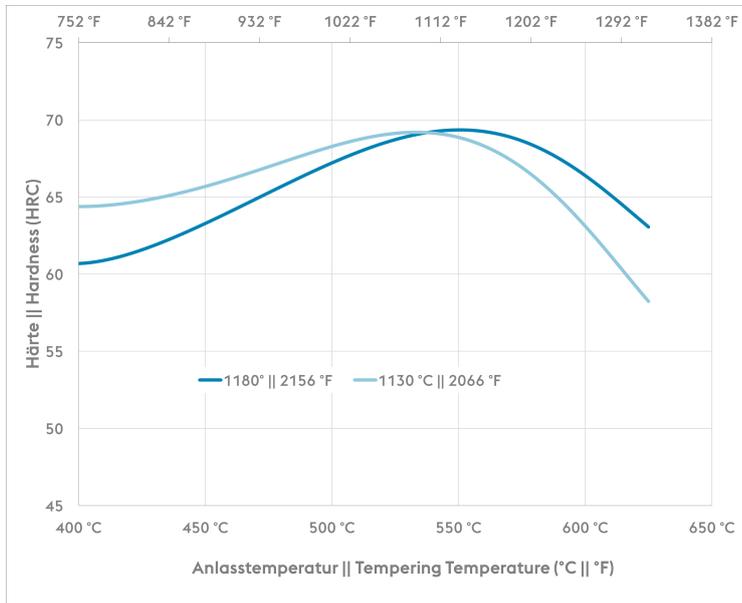
**Stress relieving**

Temperature	600 to 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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**Hardening and Tempering**

Temperature	1,130 to 1,180 °C	Salt bath, vacuum    Preheating: 1st stage ~ 500 °C, 2nd stage ~ 850 °C, 3rd stage ~1050 °C    Austenitising: 1130 - 1180 °C, holding time after complete heating 80 seconds, maximum 150 seconds, to avoid material damage due to overheating.   Quenching: oil, warm bath (500 - 550 °C), gas In continuous heat treatment, temperatures and times may vary depending on the specific heat treatment process.
Temperature	550 to 570 °C	Slow heating to tempering temperature immediately after austenitising.    Dwell time in the furnace at least 2 hours    Slow cooling to room temperature    3 tempering cycles recommended    Hardness see tempering chart In continuous heat treatment, temperatures and times may vary depending on the specific heat treatment process.

Tempering Chart



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

Physical Properties

<b>Temperature (°C)</b>	<b>20</b>
Density (kg/dm <sup>3</sup> )	81
Thermal conductivity (W/(m.K))	20
Specific heat (kJ/kg K)	43
Spec. electrical resistance (Ohm.mm <sup>2</sup> /m)	52
Modulus of elasticity (10 <sup>3</sup> N/mm <sup>2</sup> )	220

Thermal Expansions between 20°C | 68°F and ...

Temperature (°C)	100	200	300	400	500	600	700
Thermal expansion (10 <sup>-6</sup> m/(m.K))	11	11.5	11.9	12.3	12.4	12.5	12.5

If other available product variants are listed in addition to long products, please note that these may differ in terms of melting process, technical data, delivery and surface condition as well as available product dimensions. For mandatory technical specifications, other requirements and dimensions, please contact our regional voestalpine BÖHLER sales companies. 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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