BÖHLER

BÖHLER S600

HIGH SPEED STEELS

Application Segments

Cutting Tools | Automotive

Available Product Variants

Long Products* | Plates

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

Product Description

BðHLER S600 ⅞ "The high-speed steel"
Ideal for mills, twist drills, and taps, broaches, cold-work tools. BÖHLER S600 is the most commonly used high-speed steel and is the starting material for our customers who deal with high-speed steel.

Process Melting

Airmelted or Airmelted + ESR (ISORAPID)

Properties

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

Applications

- Broaches and Reamers
- Gear Cutting, Shaving and Shaping Tools
- Rolling
- Standard Parts (Moulds, Plates, Pins, Punches)
- Thread rolling
- Wear Applications
- Clamping
- Roll Forming
- Cold Forming / Coining
- Injection Components
- Industrial Knives
- Twist Drills and Taps
- Blades for Sawing Machines
- Mineral Processing
- Other Industrial Components
- Packaging industry
- Fine Blanking, Stamping, Blanking
- Powder Pressing
- Special Cutting Tools
- Wear parts
- Machine knife (for producers)
- Drilling
- Turbo Chargers

Technical data

Material designation	
1.3343	SEL
HS6-5-2C	EN

Standards	
4957	EN ISO

Chemical composition (wt. %)

C	Cr	Mo	V	W
0.9	4.1	5	1.8	6.2

Material characteristics

	Compressive strength	Grindability	Red hardness	Toughness	Wear resistance	Edge Stability
BÖHLER S600	★★★	★★★	★★★	★★	★★	★★★
BÖHLER S200	★★★	★★	★★★	★★	★★★	★★
BÖHLER S401	★★	★★★	★★	★★★	★★	★★★
BÖHLER S404	★★	★★★	★★	★★★	★★	★★
BÖHLER S405	★★★	★★★	★★	★★★	★★	★★
BÖHLER S430	★★	★★★	★★	★★★	★★	★★
BÖHLER S500	★★★★	★★★	★★★★	★★	★★★	★★★
BÖHLER S607	★★★	★★★	★★★	★★	★★★	★★★
BÖHLER S630	★★★	★★★	★★★	★★	★★	★★★
BÖHLER S705	★★★	★★★	★★★★	★★	★★	★★★★
BÖHLER S730	★★★	★★★	★★★★	★★	★★	★★★★

Delivery condition

Annealed

Hardness (HB)	max. 280
Ultimate tensile strength (UTS) (MPa)	max. 950
Tensile Strength (MPa)	max. 950

Hardened and Tempered

Hardness (HRC)	min. 62 | bars hardened and tempered (BHT)

Heat treatment

Annealing

Temperature	770 to 840 °C	Controlled slow cooling in furnace (10 - 20°C / h (50 - 68°F / h)) to approx. 600°C (1110°F), air cooling.

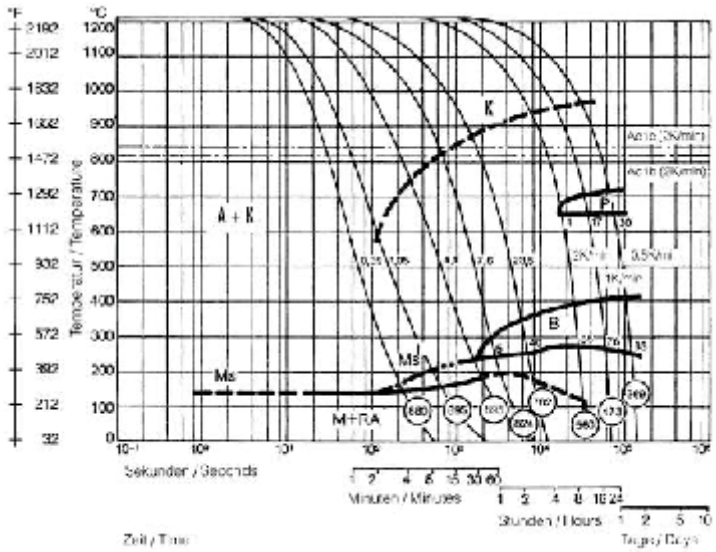
Stress relieving

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.

Hardening and Tempering

Temperature	1,100 to 1,210 °C	Salt bath, vacuum || Preheating: 1st stage ~ 500 °C, 2nd stage ~ 850 °C, 3rd stage ~1050 °C || Austenitising: 1100 - 1210 °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
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

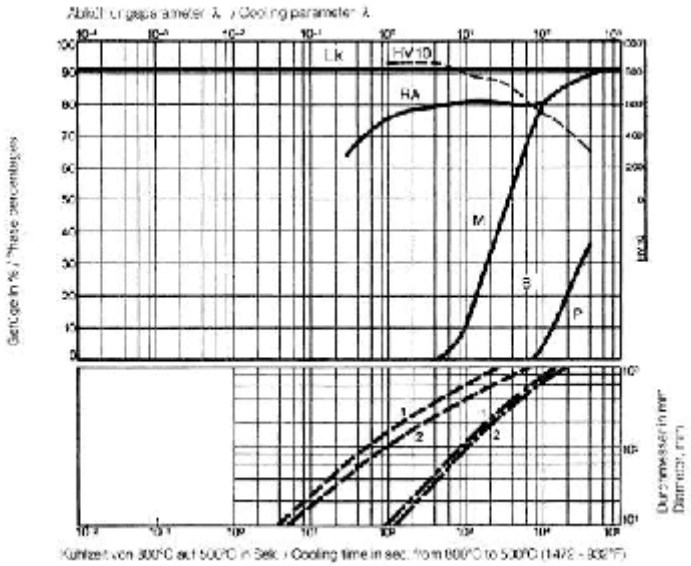
Continuous cooling CCT curves



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

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

Quantitative phase diagram



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

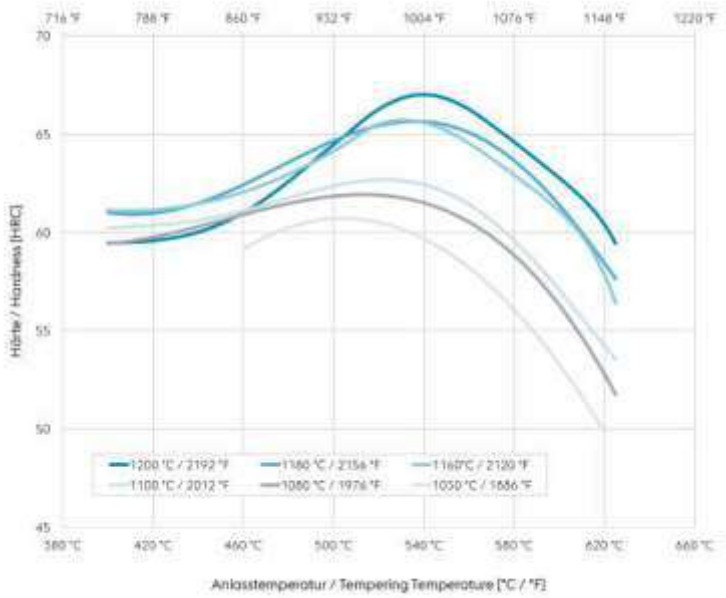
1....Edge or Face
2....Core
3....Jominy test: distance from[f]
quenched end

[f]

œ[f]œ[fffffff]oilcooling

œ[f¯f]œ[ffff]aircooling

Tempering Chart



Vacuum

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

Physical Properties

Temperature (°C)	20
Density (kg/dm³)	8.07
Thermal conductivity (W/(m.K))	21.8
Specific heat (kJ/kg K)	0.433
Spec. electrical resistance (Ohm.mm²/m)	0.47
Modulus of elasticity (10³N/mm²)	219

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

Temperature (°C)	100	200	300	400	500	600	700
Thermal expansion (10ἐ̈Ω m/(m.K))	11.5	11.7	12.2	12.4	12.7	13	12.9

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ONE STEP AHEAD.

OUR PRESENCE

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