

# HIGH SPEED STEELS

## Application Segments

[Cutting Tools](#)
[Automotive](#)

## Available Product Variants

[Long Products\\*](#)
[Plates](#)

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

## Product Description

BÖHLER S705 ⅞ "The industrial one"

The conventional high-speed steel for industrial applications in machining. With a well-balanced alloy position and cobalt content, this type always manages to get the job done. Cobalt-alloyed molybdenum high-speed steel with high hardness, excellent cutting properties, outstanding compressive strength, high hot hardness, and good toughness.

## 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

- > Broaches and Reamers
- > Twist Drills and Taps
- > Other Automotive Components (Sealing Rings, Sensors, Steering Systems)
- > End Mills
- > Special Cutting Tools
- > Turbo Chargers
- > Gear Cutting, Shaving and Shaping Tools
- > Blades for Sawing Machines

## Technical data

Material designation		Standards	
1.3243	SEL	4957	EN ISO
HS6-5-2-5	EN		

Chemical composition (wt. %)

C	Cr	Mo	V	W	Co
0.92	4.1	5	1.9	6.2	4.8

Material characteristics

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

Delivery condition

Annealed

Hardness (HB)	max. 280   drawn execution max. 290HB
Tensile Strength (N/mm <sup>2</sup> )	max. 980

Heat treatment

Annealing

Temperature	770 to 840 °C	Controlled slow cooling in furnace ( 10 to 20°C/h / (50 to 68°F/h)) to approx. 600°C (1112°F), air cooling.
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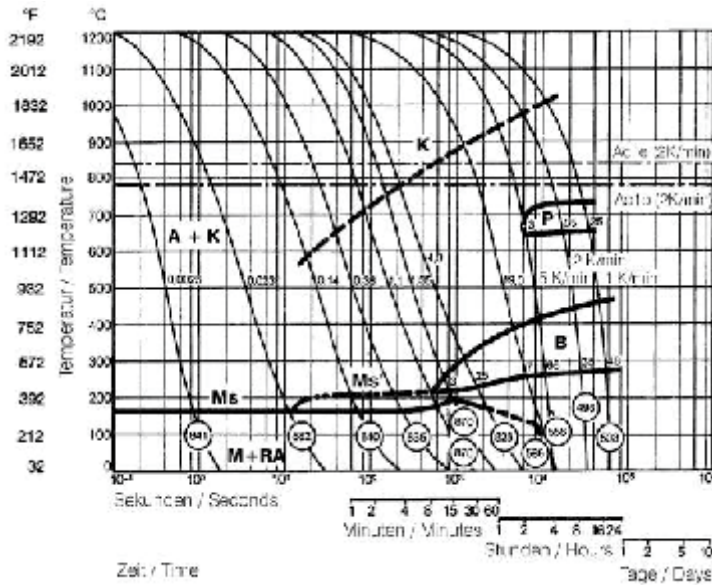
Stress relieving

Temperature	600 to 650 °C	Slow cooling in 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	1,190 to 1,230 °C	Salt bath, vacuum    Preheating: 1st stage ~ 500 °C, 2nd stage ~ 850 °C, 3rd stage ~1050 °C    Austenitising: 1190 - 1230 °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 1 hour per 20 mm material thickness (at least 1 hour)    Slow cooling to room temperature    3 tempering cycles recommended    Hardness see tempering chart

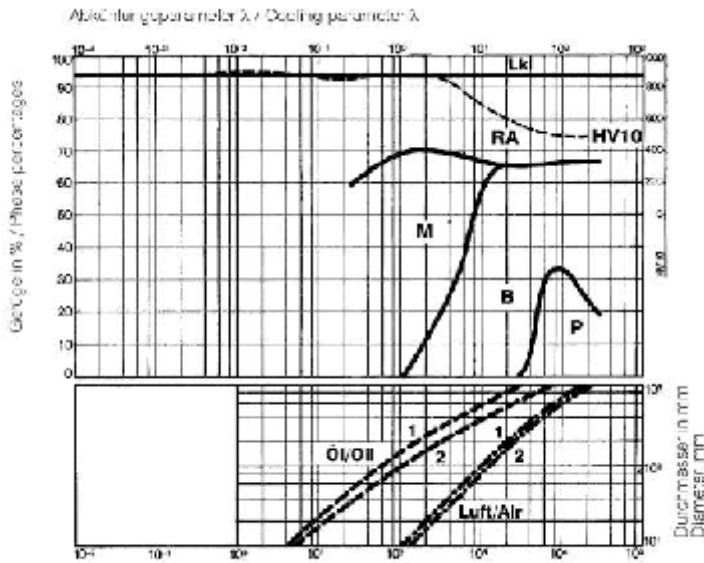
Continuous cooling CCT curves



Austenitising temperature: 1200°C (2192°F)  
 Holding time: 180 seconds

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

Quantitative phase diagram



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

- 1....Edge or Face
- 2....Core
- 3....Jominy test: distance from quenched end

Kühlzeit von 900°C auf 500°C in Sek. / Cooling time in sec. from 900°C to 500°C (1472 - 932°F)

# OUR PRESENCE



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