COLD WORK TOOL STEELS

Application Segments

Cold Work

Available Product Variants

Long Products

Product Description

Shock resisting steel with high toughness and good wear resistance. Universally usable. Hardened and tempered to 145,03 - 159,53 ksi (1000 - 1100 MPa). Normally no further heat treatment is required.

Process Melting

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Applications

- Cold Forming
- Coining

Technical data

Material designation	
~1.2358	SEL
~60CrMoV18-5	EN

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V
0.60	0.35	0.80	4.50	0.50	0.25

Delivery condition

Annealed	
Hardness (HB)	max. 240

Hardened and Tempered	
Hardness (HB)	280 to 311

Heat treatment

Annealing

Temperature	820 to 860 °C	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (18 to 36 °F/hr) down to approximately 600 °C (1112 °F) || Further cooling in air.

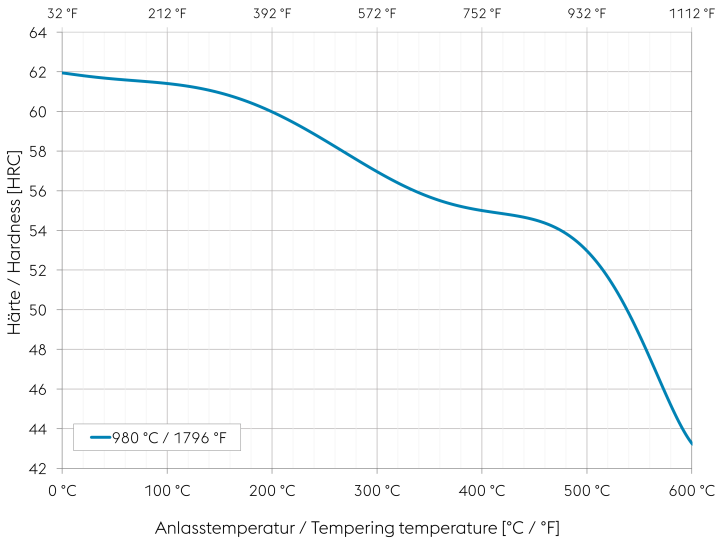
Stress relieving

Temperature	600 to 650 °C	After through heating, hold in neutral atmosphere for 1-2 hours. || Slow cooling in furnace || Intended to relieve stresses caused by extensive machining or in complex shapes.

Hardening and Tempering

Temperature	950 to 980 °C	Quenching: Oil, air. || Holding time after temperature equalization: 15 to 30 minutes. || After hardening, tempering to the desired working hardness according to the tempering chart.

Tempering chart



Specimen size: square 20 mm (0,787 inch)

Slow heating to tempering temperature immediately after hardening.

Time in furnace 1 hour for each 20 mm (0,787 inch) of workpiece thickness but at least 2 hours.

Please refer to the tempering chart for guide values for the achievable hardness after tempering.

Tempering for stress relieving 30 to 50 °C (86 to 122 °F) below the highest tempering temperature.

Cooling in air after each tempering step is recommended.

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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