

## COLD WORK TOOL STEELS

Application	Segments						
Cold Wo	ork						
Available Pro	oduct Variants						
Long Prod	lucts						
Product Des	cription						
Shock resisting s 1000 - 1100 MP	teel with high toughr Pa). Normally no furth	ness and good wear resis her heat treatment is rec	stance. Universally usa quired.	ble. Hardened and tem	pered to 145,03 - 159,53 ksi		
Process Melt	ting						
Airmelte	ed						
Applications	5						
> Cold Forming			> Coining				
echnical da	ita						
Material desigr	~1.2358 SE ~60CrMoV18-5 EN						
Chemical co	mposition (wt. 9	%)					
с	Si	Mn	Cr	Мо	V		
0.60	0.35	0.80	4.50	0.50	0.25		
Delivery con	dition						
Annealed							
Hardness (HB)		max. 240	max. 240				

Hardened and Tempered		
Hardness (HB)	280 to 311	

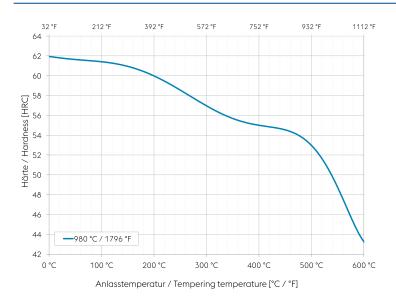




## Heat treatment

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	
Temperature	0201000000	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 Te	empering		
	950 to 980 °C	Quenching: Oil, air.    Holding time after temperature equalization: 15 to 30 minutes.    After	

## **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  $^{\circ}$ C (86 to 122  $^{\circ}$ 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 condition ur 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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