COLD WORK TOOL STEELS

Application Segments

Cold Work

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

BÖHLER K601 corresponds to the material 1.2746 (45NiCrMoV16 6). The alloy concept of this tool steel is similar to 1.2767. With its high nickel content, this material offers a very good combination of through hardenability and toughness. Additional alloying with vanadium and molybdenum achieves higher resistance to abrasive wear. This material is used where high resistance to impact and shock loads is required and the wear resistance of a 1.2767 material is insufficient. The material is used in applications such as highly stressed industrial knives in the recycling industry.

Process Melting

Airmelted

Properties

- Toughness & Ductility : high
- Dimensional stability : good

Applications

- Machine knife (for producers)
- Components for the recycling industry
- Fine Blanking, Stamping, Blanking
- Packaging industry
- Standard Parts (Molds, Plates, Pins, Punches)
- Cold Forming / Coining

Technical data

Material designation	
1.2746	SEL
~ 45NiCrMoV16-6	EN

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	Ni	V
0.45	0.30	0.80	1.50	0.80	4.00	0.50

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive	Wear resistance adhesive
BÖHLER K601	★	★★★	★★★★	★★	
BÖHLER K305	★★★★★	★★★	★★	★★★★★	
BÖHLER K306	★★★★	★★★	★★★★	★★★	
BÖHLER K313	★★★★	★★★	★★★	★★★	
BÖHLER K320	★★★	★★★	★★★	★★★	
BÖHLER K329	★★★	★★★	★★★★	★★★★	
BÖHLER K600	★	★★★	★★★★★	★	
BÖHLER K605	★★	★★★	★★★★	★	

Delivery condition

Annealed

Hardness (HB)	max. 295

Heat treatment

Annealing

Temperature	610 to 650 °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.

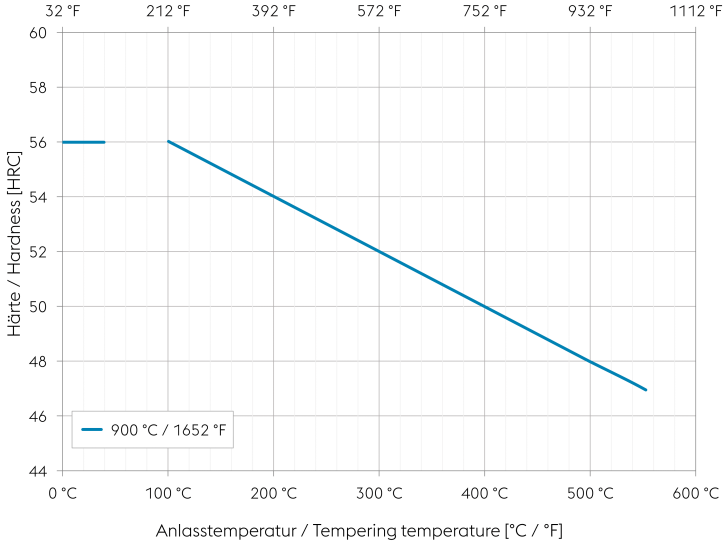
Stress relieving

Temperature	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	880 to 910 °C	Quenching: Oil, salt bath (300 to 400 °C | 572 to 752 °F), 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.

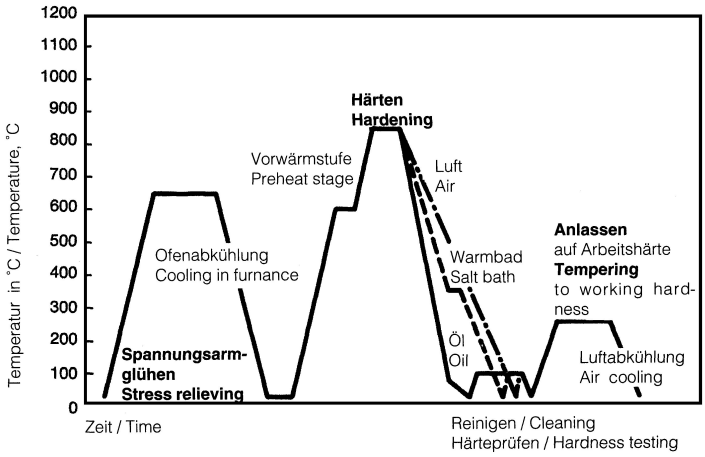
Time in furnace 1 hour for each 20 mm (0,787 inch) of workpiece thickness but at least 2 hours.

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.

Heat treatment sequence



Physical Properties

Temperature (°C)	20
Density (kg/dm³)	7.85
Thermal conductivity (W/(m.K))	28
Specific heat (kJ/kg K)	0.46
Spec. electrical resistance (Ohm.mm²/m)	0.3
Modulus of elasticity (10³N/mm²)	210

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

Temperature (°C)	100	200	300	400	500
Thermal expansion (10^{-6} m/(m.K))	11	12.5	13	13.5	14

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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