

<b>Quality</b>	<b>45NiCrMo16</b>	Supply conditions:
According to standards	EN ISO 4957 : 2002	Annealed
Number	<b>1.2767</b>	

Chemical composition							
C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	Ni%
0,40-0,50	0,10-0,40	0,20-0,50	0,030	0,030	1,20-1,50	0,15-0,35	3,80-4,30
± 0.03	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.07	± 0.03	± 0.07
Product deviations are allowed							

Temperature °C					
Hot-forming	Quenching	Tempering	Stress-relieving annealing <sup>1)</sup>	<sup>1)</sup> stress-relieving must be done after machining and before quenching	
1050-850	heating up to 680, pause, then 840-870 oil, polymer (HRC 54-58) forced air (HRC 53-57)	immediately after quenching 200-600 air minimum <b>2</b> cycles	630 furnace cooling to 350, then air		
Soft annealing	Stress-relieving	Pre-heating welding	Stress-relieving after welding		
630-650 air (HB max 285)	50° under the temperature of tempering	350	550 furnace cooling		
		<b>Ac1</b>	<b>Ac3</b>	<b>Ms</b>	<b>Mf</b>
		640	740	250	30

Mechanical properties												
Tempering table values at room temperature on Ø 25 mm after quenching at 880 °C in oil												
HB	577	577	560	543	512	482	455	432	409	390	371	353
HRC	56	56	55	54	52	50	48	46	44	42	40	38
N/mm <sup>2</sup>	2160	2160	2070	2010	1880	1760	1640	1520	1430	1340	1250	1180
Tempering at °C	<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>	<b>450</b>	<b>500</b>	<b>550</b>	<b>600</b>
Thermal expansion	10 <sup>-6</sup> · K <sup>-1</sup>				11.7	12.5	13.0	13.4	13.7	13.8		
Modulus of elasticity	long. GPa			210								
Modulus of elasticity	tang. GPa			80								
Testing at	°C			<b>20</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>600</b>		
Specific heat capacity J/(Kg·K)	Density Kg/dm <sup>3</sup>	Thermal conductivity W/(m·K)				Specific electric resist. Ohm·mm <sup>2</sup> /m			Electrical conductivity Siemens·m/mm <sup>2</sup>			
460	7.85	28				0.30			3.33			

### Steel for medium and large-sized moulds

- high hardenability also for large dimensions
- it is supplied in the annealed condition to facilitate engraving before the quenching and tempering
- self-hardening steel, good toughness
- during heat treatment it is little sensitive to deformations
- applications: *plastic moulds, punches, rolls for hot-workings, bending tools, shears for sheets, molds for hot coining*