

Quality	45NiCrMoV16-6	Supply conditions:	<i>Technical card</i>
According to standards	Werkstoff	Annealed HB max 295	Lucefin Group
Number	1.2746		rev. 2018

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	Ni%	V%
0,41-0,49	0,15-0,35	0,60-0,80	0,025	0,020	1,40-1,60	0,73-0,85	3,80-4,20	0,45-0,55

Temperature °C

Hot-forming	Stress-relieving annealing ¹⁾	¹⁾ Annealing must be done after machining and before quenching	Quenching +Q	Tempering +T	
1050-900 followed by slow cooling	650 furnace cooling to 350, then air		heating up to 640-660 pause, then 880-910 air, oil, polymer, b.t. 180-220, fluid-bed (HRC 56)	immediately after quenching 160-250 air or 250-600 see tempering table	
Soft annealing +A	Stress-relieving +SR	Pre-heating welding	Stress-relieving after welding		
610-650 controller cooling in the furnace (HB max 295)	50° under the temperature of tempering	350	550 furnace cooling		
		Ac1	Ac3	Ms	Mf
		730 *	780 *	230 *	10 *

b.t. hot-bath. * calculated with formula

Mechanical properties

Tempering table values at room temperature on Ø 25 mm after quenching at 900°C in oil

HB	577	560	543	525	512	496	482	468	455	442	421
HRC	56	55	54	53	52	51	50	49	48	47	45
R N/mm ²	-	-	-	-	-	1760	1700	1640	1580	1560	1460
Tempering °C	100	150	200	250	300	350	400	450	500	550	600
Thermal expansion	10 ⁻⁶ • K ⁻¹		►	11.9	12.7	13.2	13.6	13.8	13.9		
Modulus of elasticity long.	GPa			210							
Modulus of elasticity tang.	GPa			80							
Specific heat capacity	J/(Kg•K)			500	477						
Thermal conductivity	W/(m•K)				42.5						
Density	Kg/dm ³			7.90							
Specific electric resist.	Ohm•mm ² /m			0.70							
Electrical conductivity	Siemens•m/mm ²			1.42							
°C				20	100	200	300	400	500	600	

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ...

Europe	Germany	China	Japan	India	R. of Korea	Russia	USA
EN	DIN	GB	JIS	IS	KS	GOST	AISI/SAE
	45NiCrMoV16-6						

Cold-work tool steels

- very high toughness values after quenching and tempering
- it can also be hardened in air by heat treatment to minimize deformations
- high hardenability
- suitable for making tools subject to repeated shocks and strong pressure
- the dies must not start to work if their temperature is not at least 250 - 300 °C.
- applications: *cold-work matrix for cutlery and minting dies, anvils, plastic moulds, die drawplates, drill bushes, banking punches, shears, scrap shear blades and blades to shear billets or steel sheets, bending tools, drawing jaws*