

Quality	46CrSiMoV7	Supply conditions:
According to standards	Werkstoff	Annealed
Number	1.2329	

Chemical composition									
C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	Ni%	V%	Cu% max
0,43-0,48	0,60-0,75	0,65-0,85	0,025	0,025	1,65-1,85	0,25-0,35	0,45-0,60	0,17-0,22	0,30

Temperature in °C				
Hot-forming	Stress-relieving	Preheating	Quenching	Tempering
	must be done after machining and before quenching			immediately after quenching
1100-900	550-600 furnace cooling	550, pause, then ▲	▲ 870-890 oil, polymer or salt bath	see table of tempering minimum 2 cycles
Soft annealing	Stress-relieving		Pre-heating welding	Stress-relieving after welding
780-800 furnace 20 °C/h to 600, then air (HB max 230)	50 under the temperature of tempering 550-600 furnace cooling 20 °C/h to 200, then air		250-300	600 furnace cooling
			Ac1	Ac3
			770	810
				Ms
				220
				Mf
				20

the symbol ▲ indicates the temperature rise to°C ▲

Mechanical properties							
Heat treatment: quenching at 870 °C in oil, tempering at 560°C							
R	N/mm ²	1430	1080	1000	900	800	440
R _{p0.2}	N/mm ²	1250	850	780	680	530	270
Test at °C		20	400	450	500	550	600

Tempering table values at room temperature after quenching at 870 °C in oil										
HB		525	512	504	496	482	468	432	371	294
HRC		53	52	51.5	51	50	49	46	40	31
N/mm ²		1950	1880	1850	1820	1760	1700	1520	1250	970
Tempering at °C		250	300	350	400	450	500	550	600	650

Thermal expansion	10 ⁻⁶ · K ⁻¹				13.2		14.5
Modulus of elasticity	long.	GPa	210		186		179
Modulus of elasticity	tang.	GPa	81		71		69
Thermal conductivity	W/(m·K)		27.0		29.1		32.4
Testing at	°C		20		400		600

Alloyed tool steel subject to high working temperatures

- high resistance to thermal shock and heat cracking
- good mechanical characteristics in hot and cold condition
- good toughness in hot condition
- suitable for polishing and photo-engraving, thanks to its high micro-purity and structural homogeneity levels
- suitable for welding operations
- applications: *dies subject to low pressure, mantle, extrusion press blocks, punches, dies and sleeves for extrusion presses*