

Quality	42CrMo4
According to standards	EN 10269: 2001
Number	1.7225

Chemical composition

C%	Si% max	Mn%	P% max	S%max	Cr%	Mo%	Deviations allowed for analysis product
0,38-0,45 ± 0.02	0,40 + 0.03	0,60-0,90 ± 0.04	0,035 + 0.005	0,035 + 0.005	0,90-1,20 ± 0.05	0,15-0,30 ± 0.03	

Temperature °C

Hot-forming	Normalizing	Quenching	Quenching	Tempering	Stress-relieving
1100-850	870 air	860 oil or polymer	850 water	550-650 air	50° under the temperature of tempering
Soft annealing	Isothermal annealing	Spheroidizing annealing	End quench hardenability test	Pre-heating welding	Stress-relieving after welding
720 air (HB max 240)	820 furnace cooling to 670, then air (HB 180-240)	730-740 furnace cooling (HB max 200)	840 water	300 Ac1 745	550 furnace cooling Ac3 790 Ms 335 Mf 120

Mechanical properties

Hot-rolled +QT EN 10269: 2001

size mm		Kv and traction test at room temperature in longitudinal							
from	to	R	Rp 0.2	A%	C%	Kv +20 °C	Kv -40 °C	Kv -100 °C	HB
		N/mm ²	N/mm ² min.	min.	min.	J min.	J min.	J min.	
60		860-1060	730	14	50	50	40	27	258-322

+QT = quenched and tempered

Min. proof strength 0.2 % at high temperatures					Rp 0.2 N/mm ² - EN 10269: 2001							
d. max	60 mm	720	702	677	640	602	562	518	475	420	375	
°C		50	100	150	200	250	300	350	400	450	500	550

Temp. °C	Mod. of elasticity GPa		Thermal expansion 10 ⁻⁶ .K ⁻¹	Plastic deformations and creep rupture resistance				
	E long.	G tang.		σ ₁ 10.000 h	(1%) 100.000 h	σ _R N/mm ²		
				10.000 h	100.000 h	10.000 h	100.000 h	
20	210	80		450	190	137	320	240
100	205	78	11.1	500	88	49	137	96
200	195	75	12.1	550	29	15	59	30
300	185	70	12.9	600				
400	175	67	13.5					
500			13.9					
600	155	59	14.1					

σ₁ = permanent creep strain strength 1%
σ_R = creep rupture strength

Specific heat capacity J/(Kg.K)	Density Kg/dm ³	Thermal conductivity W/(m.K)			Specific electric resist. Ohm.mm ² /m	Electrical conductivity Siemens.m/mm ²
		20°C	250°C	500°C		
460	7.85	33.5	34.0	34.2	0.19	5.26

Kv and traction test at room temperature in longitudinal on hot-rolled +QT material. **Lucefin** experience

diameter mm	grain size	R	Rp 0.2	Rp/R	A%	C%	Kv +20 °C	Kv -20 °C
		N/mm ²	N/mm ²		min.	min.	J min.	J min.
40	6	995	845	0,85	15,2	58	90-90-92	60-58-58
60	5-6	947	767	0,81	16.0	60	84-78-80	50-50-56

Data under fatigue +20 °C

+N	328	Cyclic yield strength, $\sigma_{y'}$
+QT	716	N/mm ² low cycle number
+N	0.12	Cyclic strength exponent, n'
+QT	0.10	low cycle number
+N	673	Cyclic strength coefficient, K'
+QT	1367	N/mm ² low cycle number

Data under fatigue +20 °C

+N	1000	Fatigue strength coefficient, σ_f'
+QT	1454	N/mm ² low cycle number
+N	-0.11	Fatigue strength exponent, b
+QT	-0.08	low cycle number
+N	-1.00	Fatigue ductility exponent, c
+QT	-0.72	low cycle number

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
42CrMo4	42CrMo4	ML42CrMo	42CrMo4	42CD4	708M40	42HM	4140