

Quality	42CrMo4
According to standards	EN 10269 (AC: 2008)
Number	1.7225

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Mo%	
0,38-0,45 ± 0.02	0,40 + 0.03	0,60-0,90 ± 0.04	0,025 + 0.005	0,035 + 0.005	0,90-1,20 ± 0.05	0,15-0,30 ± 0.03	Product deviations are allowed

Temperature °C

Hot-forming	Normalizing +N	Quenching +Q	Quenching +Q	Tempering +T	Stress-relieving +SR
1100-850	870 air	860 oil or polymer	850 water	540-680 air	50° under the temperature of tempering
Soft annealing +A	Isothermal annealing +I	Spheroidizing annealing +AC	End quench hardenability test	Pre-heating welding	Stress-relieving after welding
720 air (HB max 241)	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 (AC: 2008)

size mm		Kv and traction test at room temperature in longitudinal							
		R	Rp 0.2	A%	C%	Kv +20 °C	Kv -40 °C	Kv -100 °C	HB
from	to	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/mm² - 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	

Plastic deformations and **creep** rupture resistance

σ₁(1%) N/mm ²			σ_R N/mm ²		
°C	10.000 h	100.000 h	10.000 h		100.000 h
450	190	137	320		240
500	88	49	137		96
550	29	15	29		15

σ₁ = permanent creep strain strength 1%

σ_R = creep rupture strength

Thermal Expansion	10 ⁻⁶ •K ⁻¹	►	12.1	12.7		13.2	13.6	14.0	14.4
Mod. of Elasticity long.	GPa	210	205	195		185	175		155
Mod. of Elasticity tang.	GPa	80	78	75		70	67		59
Specific Heat Capacity	J/(Kg•K)	460							
Thermal Conductivity	W/(m•K)	33.5			34.0			34.2	
Density	Kg/dm ³	7.85							
Specific Electric Resist.	Ohm•mm ² /m	0.19							
Electrical Conductivity	Siemens•m/mm ²	5.26							
°C		20	100	200	250	300	400	500	600

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

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

diameter	grain	R	Rp 0.2	Rp/R	A%	C%	Kv +20 °C	Kv -20 °C
mm	size	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

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Data under fatigue +20 °C

+N	328	Cyclic yield strength, σ_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
+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

+N = normalization +QT = quenching and tempering

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

T.T.T. curve

