

Quality	10CrMo9-10
According to standard	UNI EN 10273: 2008
Number	1.7380

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Mo%	Cu% max	Deviations allowed for analysis product
0,08-0,14	0,50	0,40-0,80	0,030	0,025	2,00-2,50	0,90-1,10	0,30	
+ 0.02	+ 0.05	+0.10 -0.05	+ 0.005	+ 0.005	± 0.10	+ 0.04	+ 0.05	

The aluminium content of the casting should be determined and indicated in the control document

Temperature °C

Hot-forming	Normalizing	Quenching	Tempering	Stress-relieving		Step cooling		
1050-900	940-980 air	950 water	650-750 air	50° under the temperature of tempering		593 furnace EN 10028-2		
Soft annealing	Spheroidizing	Pre-heating welding	Stress-relieving after welding (PWHT)		Ac1	Ac3	Ms	Mf
650-700 air (HB max 210)	880-900 furnace cooling	300	600-690 furnace cooling		795	850	440	230

Mechanical properties

Hot-rolled mechanical properties in the delivery condition ^{b)} UNI EN 10273: 2008

size mm	Heat treatment ^{b)}	Kv and traction test at room temperature in longitudinal						
		R N/mm ²	ReH N/mm ² min.	A% min.	Kv +20 °C J min.	Kv 0 °C J min.	Kv -20 °C J min.	HB
from 16	+NT	480-630	310	18	40			146-192
16 to 40	+NT	480-630	300	18	40			146-192
40 to 60	+NT	480-630	290	18	40			146-192
60 to 100	+NT / +QT	470-620	270	17	40			141-190
100 to 150	+NT / +QT	460-610	250	17	40			139-183

+NT = normalized and tempered; +QT = quenched and tempered

Min. proof strength 0.2 % at high temperatures UNI EN 10273: 2008

from	to	H.T.	Rp 0.2 N/mm ²									
16	16	+NT	288	266	254	248	243	236	225	212	197	185
16	40	+NT	279	257	246	240	235	228	218	205	191	179
40	60	+NT	270	249	238	232	227	221	211	198	185	173
60	100	+NT / +QT	260	240	230	224	220	213	204	191	178	167
100	150	+NT / +QT	250	237	228	222	219	213	204	191	178	167
		°C	50	100	150	200	250	300	350	400	450	500

Temp.	Mod. of elasticity GPa	Thermal expansion	Thermal conductivity	Specific heat capacity	Specific electric resist.	Density
°C	E long.	10 ⁻⁶ · K ⁻¹	W/(m·K)	J/(Kg·K)	Ohm·mm ² /m	Kg/dm ³
-100	217	10.5		423		
0	213	11.4		456		
20	212	11.5	34.9	461	0.298	7.84
100	207	12.1	37.3	479	0.343	
200	199	12.7	38.2	499	0.413	
300	192	13.2	37.8	517	0.497	
400	184	13.6	36.6	536	0.595	
500	175	14.0	35.2	558	0.703	
600	164	14.4	33.6	587	0.825	

EUROPA EN	ITALIA UNI	SPAGNA UNE	GERMANIA DIN	FRANCIA AFNOR	UK B.S.	SVEZIA SS	USA AISI/SAE
10CrMo9-10	10CrMo9-10	10CrMo9-10	10CrMo9-10	12CD9-10	622/B3	2218	A182 F22

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Plastic deformations and creep rupture resistance EN 10273: 2002

°C	σ_1 (1%) N/mm ²		σ_R N/mm ²		
	10.000 h	100.000 h	10.000 h	100.000 h	200.000 h
450	240	166	306	221	201
460	219	155	286	205	186
470	200	145	264	188	169
480	180	130	241	170	152
490	163	116	219	152	136
500	147	103	196	135	120
510	132	90	176	118	105
520	119	78	156	103	91
530	107	68	138	90	79
540	94	58	122	78	68
550	83	49	108	68	58
560	73	41	96	58	50
570	65	35	85	51	43
580	57	30	75	44	37
590	50	26	68	38	32
600	44	22	61	34	28

σ_1 = permanent creep strain 1%

σ_R = creep rupture strength

