Quality	20CrMoS4	Case-hardening Steel	*Technical card*
According to standards	**ISO 683-17: 2014**		***Lucefin Group***
Number	-		*rev. 2018*

Chemical composition

C%	Si% max	Mn%	P% max	S%	Cr%	Mo%	Al% max	Cu% max	
0,17-0,23	0,40	0,60-0,90	0,025	0,020-0,030	0,90-1,20	0,15-0,25	0,050	0,30	Product deviations are allowed
± 0.02	± 0.03	± 0.04	+0.005	-	± 0.05	± 0.03	+0.010	+0.03	

For 20CrMo4 n° 1.3567 S% max 0.030 product deviations ± 0.02

Temperature °C

Hot-forming	Core hardening	Tempering +T	Carburizing	Hardening carburiz. surface	Tempering +T
1150-900	860-900 acqua, oil, polymer	450-600	880-980	780-820 oil, polymer, b.t.	180-200

Soft Annealing +A	Spheroidized annealed +AC	Annealing +FP	End quench hardenability test	Pre-heating welding	Stress-relieving after welding
680-700 cooling 15 °C/h to 600 after air (HBW max 207)	(HBW 170)	- (HBW 146-193)	900 water	200-300 welding must be carried out on the annealed state and before carburizing	500 furnace cooling

Ac1	Ac3	Ms	Mf
745	825	420	200

b.t. = salt bath 580-600 °C. For products +AC+C HBW max 170

Mechanical properties

Hot-rolled mechanical properties after quenching and stress-relieving, *only information*

size mm		Testing at room temperature (longitudinal)					
		R	**Rp** 0.2	**A%**	**Z%**	**Kv**	***HB***
from	to	N/mm²	N/mm² min.	min.	min.	J min.	
	11	1130-1420	880	8	-	-	*339-400*
11	25	835-1130	590	9	-	-	*250-339*
25	40	735-980	540	10	-	-	*224-295*

Indicative mechanical properties

Heat treating	**R** N/mm²	**HB**
Normalizing +N	> 750	> 225
Subcritical annealing	< 635	< 195
Spheroidizing +AC	< 595	< 178
Isothermal annealing +I	470-685	141-208

20CrMo4 1.3567 **Jominy test HRC** grain size G 5 ISO 683-17: 2014

mm distance from quenched end

	1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	50	
min	40	39	35	31	28	25	24	23	20	20	-	-	-	-	-	**H**
max	48	48	47	44	41	39	37	35	33	31	30	30	29	29	28	

Table of tempering values obtained at room temperature on rounds Ø 10 mm after quenching at 890 °C in oil

R	N/mm²	1450	1400	1320	1210	1080	910	650
Rp 0.2	N/mm²	1170	1160	1110	1010	890	730	550
A	%	10	12	11	11	12	15	20
Z	%	50	55	58	60	62	66	70
Tempering **°C**		**100**	**200**	**300**	**400**	**500**	**600**	**700**

EUROPE EN	ITALY UNI	SPAIN UNE	GERMANY DIN	FRANCE AFNOR	UK B.S.	SWEDEN SS	USA AISI/SAE
-	-	-	-	-	-	-	-