

Quality	SAE 1018	<i>Technical card</i>
According to standards	ASTM A 576-90b: 2000 Hot rolled	<i>Lucefin Group</i>
	ASTM A 311/A 311M: 2004 Cold drawn	

Chemical composition

C%	Si%	Mn%	P%	S%	Product deviations are allowed
0,15-0,20	a)	0,60-0,90	max 0,040	max 0,050	allowed
± 0.02		± 0.03	+ 0.008	+ 0.008	

NOTE: if fine grain min. 5 is specified in the order, Al content should be of not less than 0.020%

In case of a 0.15 to 0.35% lead addition, the steel is identified as 10L18

a) the following values are usually specified at the time of order placement: 0.10 max, 0.10-0.20, **0.15-0.35**, 0.20-0.40, 0.30-0.60

Temperature °C

Hot-forming	Soft annealing +A	Normalizing	Quenching	Tempering
1180-900	650-700 furnace cooling	920 air	880-900 oil polymer or water	550-620 air
			Pre-heating welding	PWHT
			not required	slow cooling

Mechanical properties ASTM A311/A 311M: 2004 Cold-drawn stress-relieved (> 288 °C) cl. A

size mm	Testing at room temperature (longitudinal)					
from to	R	Rp 0.2	A	C reduct.	HB	
	N/mm ²	N/mm ²	%	%	min	
20	485	415	18	40	147	
20 30	450	380	16	40	135	
30 50	415	345	15	35	123	
50 75	380	310	15	35	110	

Cold-drawn mechanical properties; Lucefin experience

flats mm	Testing at room temperature (longitudinal)						
	R	Rp 0.2	A	C reduct.	HB	M. elasticity	Heat treatment
	N/mm ²	N/mm ²	%	%		N/mm ²	
76 x 32	581	556	13,4	60,7	176	253600	+U untreated
76 x 32	553	438	17,6	60,8	162	251800	+T cold-drawn tempered at 550 °C
76 x 32	530	384	27,2	59,0	159	186000	+T cold-drawn tempered at 620 °C

Hot-rolled mechanical properties

size mm	Testing at room temperature (longitudinal)					Heat treatment
	R	Rp 0.2	A	C reduct.	HB	
	N/mm ²	N/mm ²	%	%		
22	634	386	27	48	≥ 197	Carburizing at 925 °C, cooling at 250 °C, heating at 780 °C, pause, then quenching in water and final tempering at 180 °C
					< 229	+U untreated
					≤ 180	+A annealed
≤ 30	400	220	25		≥ 116	+N normalized (J1397)

Condition	Cyclic yield strength, σ_y' N/mm ²		Cyclic strength exponent, n'	Cyclic strength coefficient, K' N/mm ²
Hot-rolled	236		0,27	1259
Quenched and tempered	190		0,24	862
Condition	Fatigue strength coefficient, σ_f' N/mm ²		Fatigue strength exponent, b	Fatigue ductility coefficient, g_f'
Hot-rolled	782		- 0,11	0,19
Quenched and tempered	423		- 0,07	- 0,09

USA AISI/SAE	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	EUROPE EN
SAE 1018	C18		1.0405		080A17		P265NL