

<b>Quality</b>	<b>SAE 1018</b>	<b>Carbon Steel</b>	<i>Technical card</i>
According to standards	ASTM A 576-17 <b>Hot rolled</b>		<b>Lucefin Group</b>
	ASTM A 311/A 311M: 2004 <b>Cold drawn</b>		rev. 2018

### 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, total aluminium 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 +N	Quenching +Q	Tempering +T
1180-900	650-700 furnace cooling	920 air	880-900 oil polymer or water	550-620 air
			<b>Pre-heating welding</b> not required	<b>PWHT</b> slow cooling

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

size mm		Testing at room temperature (longitudinal)				
		R	Rp 0.2	A	Z reduct.	HB for information
from	to	N/mm <sup>2</sup>	min	N/mm <sup>2</sup>	min	% min
	20	485		415		18
	20	450		380		16
	30	415		345		15
	50	380		310		15
	75					35
						110

### Cold-drawn mechanical properties; Lucefin experience

flats mm		Testing at room temperature (longitudinal)						
		R	Rp 0.2	A	Z reduct.	HB	M. elasticity	Heat treatment
		N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%		GPa	
76 x 32		581	556	13,4	60,7	176	253	+U untreated
76 x 32		553	438	17,6	60,8	162	251	+T cold-drawn tempered at 550 °C
76 x 32		530	384	27,2	59,0	159	186	+T cold-drawn tempered at 620 °C

### Hot-rolled indicative mechanical properties

size mm		Testing at room temperature (longitudinal)				Heat treatment	
		R	Rp 0.2	A	Z reduct.	HB	
		N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%		
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	50	≥ 116	+N normalized (SAE J 1397)

Condition	Cyclic yield strength, $\sigma_y'$ N/mm <sup>2</sup>	Cyclic strength exponent, n'	Cyclic strength coefficient, K' N/mm <sup>2</sup>
Hot-rolled +U	236	0,27	1259
Hot-rolled +QT	190	0,24	862
Condition	Fatigue strength coefficient, $\sigma_f'$ N/mm <sup>2</sup>	Fatigue strength exponent, b	Fatigue ductility coefficient, $g_f'$
Hot-rolled +U	782	- 0,11	0,19
Hot-rolled +QT	423	- 0,07	- 0,09

**Estimated mechanical properties, for information**

*Lucefin Group*

size		Testing at room temperature (longitudinal)						
mm		<b>R</b>	<b>Rp 0.2</b>	<b>A%</b>	<b>Z%</b>	<b>HB</b>		
from	to	N/mm <sup>2</sup> min	N/mm <sup>2</sup> min	min	min	min		
16	22	483	413	18	40	146	ASM vol. 1	
22	32	448	379	16	40	131	<b>Cold-drawn +C</b>	
32	51	414	345	15	35	121		
51	76	379	310	15	35	111		
16	22	448	310	20	45	131	ASM vol. 1	
22	32	414	310	20	45	121	<b>Cold-drawn stress relief</b>	
32	51	379	310	16	40	111	<b>+C+SR at 480 °C</b>	
51	76	345	276	15	40	101		
<b>EUROPE</b>	<b>ITALY</b>	<b>CHINA</b>	<b>GERMANY</b>	<b>FRANCE</b>	<b>U.K.</b>	<b>RUSSIA</b>	<b>USA</b>	
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE	
P265NL	C18		1.0405		080A15 / 080A17		SAE 1018	