

Quality	ASTM A 350 LF2	Low Temperature Carbon steel
According to standards	ASTM A 350M – 17	
Number	Classes 1 and Classes 2	

Chemical composition

C%	Si%	Mn%	P%	S%	Cu%	Ni%	Cr%	Mo%	V%	Nb%
max			max	max	max	max	max	max	max	max
0,30	0,15-0,30	0,60-1,35	0,035	0,040	0,40	0,40	0,30	0,12	0,08	0,02

The sum of copper (Cu), nickel (Ni), chromium (Cr), molybdenum (Mo), vanadium should not exceed 1,00%

The sum of chromium (Cr) and molybdenum (Mo) should not exceed 0,32%

Carbon Equivalent CE = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 max 0,47

Steels to which lead has been added shall not be used

By agreement, the limit for niobium (Nb) may be increased up to 0,05% on heat analysis and 0,06% on product analysis

Temperature °C

Hot-forming	Normalizing +N	Quenching +Q	Tempering +T	Stress-relieving +SR			
1150-850	870-940 air cooling	870-940 oil / polymer water	590 air cooling	50 under the temperature of tempering			
Soft annealing +A	Normalizing and tempering +NT	Isothermal annealing +I		Pre-heating welding		Stress-relieving after welding (PWHT)	
700 air cooling	900 air 600 air	860 furnace cooling to 660 then, air		200		590 furnace cooling	
				Ac1	Ac3	Ms	Mf
				-	-	-	-

Mechanical properties

Forged values as reference Heat treatments must **guarantee** the reported values ASTM A 350M - 17

all dimension mm	Testing at room temperature (longitudinal)						
	R	Rp 0.2	A%	Z%	Kv -46 °C cl. 1	Kv -18 °C cl. 2	HBW
	N/mm ²	N/mm ² min.	min.	min.	J average / minimum		max
T	485-655	250	22	30	20 / 16	27 / 20	197

T= max heat-treated thickness Test specimen should correspond to the 1/4 T

Temperature	Mod. of Elasticity	GPa	Density	Kg/dm ³
20 °C	203		7.86	

Mechanical properties (longitudinal testing) **LUCEFIN** experience

Heat treatments	Ø product mm	R N/mm ²	Rp 0.2 N/mm ²	A %	Z %	Kv -46 °C J	Kv -18 °C J	product
Quenching 880 °C water Tempering 640 °C air	95	600	480	24.6	58.0	68-66-64	112-114-110	Hot-rolled
Normalizing 900 °C air	210	580	400	32.6	64.4	22-24-18	70-74-70	Hot-rolled
+M Thermo-mechanically	80	526	302	29.4	64.0	10-10-22	40-48-46	Hot-rolled
Normalizing 900 °C air	50	548	320	28.6	64,0	30-42-36	78-80-84	Hot-rolled
Natural	95	526	302	28.6	62.0	6-6-4	16-10-8	Hot-rolled

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
S355J2G3 ~	Fe510 appr.	16Mn	St52.3 N		50D	20G	A350 LF2 cl. 1 – cl. 2



Hot-rolled
Quenched and tempered
Martensite and traces of bainite
X500