Quality	**S235JR** (Fe 360 BFN)	*Technical card*
According to standard	**EN 10025-2: 2004**	***Lucefin Group***
Number	**1.0038**	

Chemical composition

C% max	**Si%**	**Mn%** max	**P%** max	**S%** max	**N%** max	**Cu%** max	
0,17 c)		1,40	0,035	0,035	0,012 a)	0,40	**Cast** analysis
0,19 c)		1,50	0,045	0,045	0,014 b)	0,45	**Product** analysis

FN deoxidation method - rimming steel not admitted

c) for nominal thickness > 40 mm up to 100 mm, max 0.20 of ladle/ 0.23 of the product.

c) for nominal thickness > 100 mm, C content to be agreed

a) max N value is not applied if chemical composition shows total Al content > 0.020%

b) max N value is not applied if chemical composition shows total Al content > 0.015%

S235JR n° 1.0122
P% - S% max 0.040
cast analysis

Temperature °C

Hot-forming	**Supply state**	**Soft annealing**	**Isothermal annealing**	**Temperature values are valid for analysis close to:**		
				C%	Mn%	Si%
1200-850	natural state	690–720 furnace (HB max 140)		~ 0.10	~ 0.50	~ 0.20

In some cases, the piece can be normalized and tempered or quenched and tempered

Normalizing and Tempering	**Quenching and Tempering**	**Stress-relieving**	**End quench hardenability**
920 air 540-650 air	920 water 540-665 air	50° under the temperature of tempering	

Pre-heating welding	**Stress-relieving after welding**
not required	slow cooling

Ac1	**Ac3**	**Ms**	**Mf**
725	880	480	260

Mechanical properties

Hot-rolled EN 10025-2: 2004 **S235JR**

Testing at room temperature

size mm from	to	**R** N/mm²	**size** mm over	to	**ReH** N/mm² min	**size** mm over	to	**A%** L min	**A%** T min	***HB*** *for information*
	3	360-510		16	235	3	40	26	24	*104-154*
3	100	360-510	16	40	225	40	63	25	23	*104-154*
100	150	350-500	40	63	215	63	100	24	22	*103-152*
150	250	340-490	63	80	215	100	150	22	22	*100-149*
			80	100	215	150	250	21	21	

Mod. of elasticity GPa		100	150	195	over	to	**Kv** L + 20 °C a) J min
E long.	**G** tang.	150	200	185		150	27
198	76	200	250	175	150	250	27

a) values to be agreed for thickness > 100 mm; impact properties are verified only if specified when placing the order

Cold-drawn +C EN 10277-2: 2008 **S235JRC** 1.0122

Testing at room temperature (longitudinal)

size mm from	to	**R** b) N/mm²	**Rp** 0.2 b) N/mm² min	**A%** min	***HB*** *for information*
5 c)	10	470-840	355	8	*141-250*
10	16	420-770	300	9	*125-231*
16	40	390-730	260	10	*114-224*
40	63	380-670	235	11	*110-203*
63	100	360-640	215	11	*104-198*

b) for flats and special profiles, yield point can be – 10% and tensile strength can be ± 10%

c) mechanical properties to be agreed when placing the order for thickness lower than 5 mm

All values are valid also for +C+SL and +SH+SL

Hot-rolled **– Peeled- Reeled** +SH

Testing at room temperature (longitudinal)

R N/mm²	**Rp** 0.2 N/mm² min	**A%** min	**HB**
360-510			102-140
360-510			102-140
360-510			102-140

Cold-drawn **Mod. of elasticity** GPa

Temperature	**E** long.	**G** tang.
20 °C	170	65

Forged normalized EN 10250-2: 2001 **S235JRG2** n° 1.0038 (Fe 360 BFN)

Tensile test and Kv at room temperature

size from	to	**R** N/mm² min	**Re** N/mm² min	**A%** L min	**A%** T min	**Kv** L + 20 °C J min	**Kv** T + 20 °C J min	***HB*** *min*
	100	340	215	24		35		*100*
100	250	340	175	23	17	30	20	*100*
250	500	340	165	23	17	27	15	*100*

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
S235JR	Fe 360 B	Q235B	RSt 37- 2		40 B	St3sp	A 252