

<b>Quality</b>	<b>S235JR</b>	<b>Steel for general engineering</b>	<i>Technical card</i>
According to standard	<b>EN 10025-2: 2014</b>		<b>Lucefin Group</b>
Number	<b>1.0038</b>		<i>rev. 2018</i>

### Chemical composition

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

FN deoxidation method - rimming steel not admitted

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

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

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

<sup>b)</sup> max N value is not applied if chemical composition shows acid soluble Al content > 0.015%

### Temperature °C

Hot-forming	Supply state +U	Soft annealing +A	Isothermal annealing +I	Temperature values are valid for analysis close to:		
1200-850	natural state (HB 165 ~)	690–720 furnace (HB max 119)	-	C%	Mn%	Si%
				~ 0.10	~ 0.50	~ 0.20
In some cases, the piece can be normalized and tempered or +NT quenched and tempered +QT				<b>Pre-heating welding</b>	<b>Stress-relieving after welding</b>	
<b>Normalizing and Tempering</b>	<b>Quenching and Tempering</b>	<b>Stress-relieving +SR</b>		not required	slow cooling	
920 air	920 water	50° under the temperature of tempering		<b>Ac1</b>	<b>Ac3</b>	<b>Ms</b>
540-650 air	540-665 air			725	880	480
						<b>Mf</b>
						260

### Mechanical properties

Hot-rolled EN 10025-2: 2014 **S235JR** (normalization +N is advised)

Testing at room temperature

size mm		R	ReH	A%	A%	Kv L +20 °C	HB	Mod. of Elasticity	
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min (L)	min (T)	J min <sup>a)</sup> (L)	for inf.	GPa +20 °C	
	3	360-510	235	-	-	-	-	long.	tang.
3	16	360-510	235	26	24	27	104-152	200	77
16	40	360-510	225	26	24	27	104-152		
40	63	360-510	215	25	23	27	104-152		
63	80	360-510	215	24	22	27	104-152		
80	100	360-510	215	24	22	27	104-152		
100	150	350-500	195	22	22	27	103-150		
150	200	340-490	185	21	21	27	100-149		

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

**Cold-drawn +C EN 10277: 2018 S235JRC 1.0122**

size mm Testing at room temperature (longitudinal)

size mm		R <sup>b)</sup>	Rp 0.2 <sup>b)</sup>	A%	HB	Hot-rolled – Peeled +SH			
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for information	Testing at room temperature (longitudinal)			
						R	Rp 0.2	A%	HBW
						N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	
5 <sup>c)</sup>	10	470-840	355	8	141-250	-	-	-	-
10	16	420-770	300	9	125-231	-	-	-	-
16	40	390-730	260	10	114-224	360-510	-	-	107-152
40	63	380-670	235	11	110-203	360-510	-	-	107-152
63	100	360-640	215	11	107-198	360-510	-	-	107-152

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

<sup>c)</sup> mechanical properties to be agreed when placing the order for thickness lower than 5 mm.

All values are valid also for +C+G (cold-drawn, ground)

**Forged normalized UNI EN 10250-2: 2001 S235JRG2 n° 1.0038**

Tensile test and Kv at room temperature

size mm		R	Re	A%	A%	Kv + 20 °C	Kv + 20 °C	HB for inf.
from	to	N/mm <sup>2</sup> min	N/mm <sup>2</sup> min	min (L)	min (T)	J min (L)	J min (T)	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	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
S235JR	Fe 360 B	Q235B	RSt 37- 2		40 B	St3sp	A 252