

Quality	S235JR (Fe 360 BFN)
According to standard	EN 10025-2: 2004
Number	1.0038

Chemical composition

C%	Si%	Mn%	P%	S%	N%	Cu%	
max		max	max	max	max	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							S235JR n° 1.0122
^{c)} for nominal thickness > 40 mm up to 100 mm, max 0.20 of ladle/ 0.23 of the product.							P% - S% max 0.040
^{c)} for nominal thickness > 100 mm, C content to be agreed							cast analysis
^{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%							

Temperature °C

Hot-forming	Supply state	Soft annealing	Isothermal annealing	Temperature values are valid for analysis close to:				
1200-850	natural state	690-720 furnace (HB max 140)		C%	Mn%	Si%		
				~ 0.10	~ 0.50	~ 0.20		
In some cases, the piece can be normalized and tempered or quenched and tempered			Pre-heating welding	Stress-relieving after welding				
Normalizing and Tempering	Quenching and Tempering	Stress-relieving	End quench hardenability	not required	slow cooling			
920 air	920 water	50° under the temperature of tempering		Ac1	Ac3	Ms	Mf	
540-650 air	540-665 air			725	880	480	260	

Mechanical properties

Hot-rolled EN 10025-2: 2004 S235JR

Testing at room temperature

size mm		R	size mm		ReH	size mm		A% L	A% T	HB		
from	to	N/mm ²	over	to	N/mm ² min	over	to	min	min	for information		
	3	360-510	16	40	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

Cold-drawn +C EN 10277-2: 2008 S235JRC 1.0122						Hot-rolled - Peeled- Reeled +SH			
size mm		Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
		R ^{b)}	Rp 0.2 ^{b)}	A%	HB	R	Rp 0.2	A%	HB
from	to	N/mm ²	N/mm ² min	min	for information	N/mm ²	N/mm ² min	min	
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	360-510			102-140
40	63	380-670	235	11	110-203	360-510			102-140
63	100	360-640	215	11	104-198	360-510			102-140

^{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

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		R	Re	A% L	A% T	Kv L + 20 °C	Kv T + 20 °C	HB
from	to	N/mm ² min	N/mm ² min	min	min	J min	J min	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	