

S235JR

Non-alloy structural steels

Material no.	1.0038
according to	DIN EN 10025-2
Tensile strength class	A

Usage

Suitability for coldforming such as bending, folding, bordering and flanging etc. can be ordered separately.

The user of these steel grades must make sure that his calculation, design and processing methods are appropriate for the material. The welding technique used must be suitable for the intended application and comply with the state-of-the-art.

With distinctly closer chemical composition values and mechanical properties, the steel grades of the S235-S355 series are used as material for wheels of passenger cars, lorries and other vehicles.

Chemical composition ¹⁾ (in percent by weight)

	min.	max.
C		0,17%
Mn		1,40%
P		0,035%
S		0,035%
N		0,012%
Cu		0,55% ²⁾
C _E	0,350% ^{3) 4)}	

1) Heat analysis

2) The maximum nitrogen content shall not apply if the total aluminium content of the steel is at least 0,020 % or if it contains enough other nitrogen-fixing elements.

3) Copper contents higher than 0,400 % can cause exfoliation corrosion.

4) Maximum carbon equivalent value

$$C_E = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15$$

Mechanical properties ¹⁾

Nom. thick. e	Yield strength R _{eH}
≤ 16 mm	≥ 235 MPa
> 16 mm	≥ 225 MPa

Nom. thick. e	Tensile strength R _m
< 3 mm	360 – 510 MPa
≥ 3 mm	360 – 510 MPa

Nom. thick. e	Total elong. A ²⁾ (long./trans.)
< 3 mm	≥ 21/19 %
3 ≤ e ≤ 25 mm	≥ 26/24 %

The samples for the tensile test are taken at right angles to rolling direction unless the product width is opposed to this.

1) The tensile test values given in the table apply to longitudinal samples; in case of strip and sheet steel of width ≥ 600 mm they apply to transverse samples.

2) It applies to nominal thickness e:
e < 3 mm: A₈₀
e ≥ 3 mm: A₅

Notch impact energy ¹⁾

Temperature	Notch impact energy
20 °C	≥ 27 J

1) Average values of 3 samples; one individual value may fall short of the required minimum value by not more than 30%. The sample width shall equal the product thickness if the latter is between 5 and 10 mm. The tests are performed by using samples similar to Charpy-V samples. The values specified in the table above are to be reduced proportionally to the sample width.

Available dimensions

Hot-rolled coils unpickled, mill-edge

Thickness in mm	Width in mm
1,50 – 1,79	900 – 1250
1,80 – 1,99	900 – 1390
2,00 – 2,24	900 – 1540
2,25 – 2,49	900 – 1700
2,50 – 12,70	900 – 1880

Hot-rolled slit strip

Thickness in mm	Width in mm
1,50 – 1,79	100 – 515
1,80 – 1,99	100 – 635
2,00 – 2,24	100 – 760
2,25 – 7,00	100 – 800
7,01 – 8,00	140 – 800
8,01 – 9,00	175 – 800
9,01 – 10,00	233 – 800

< 100 mm on request

Welding

The steel grades JR, JO, J2 and K2 categories are in general suitable for all welding techniques.

Condition of delivery, scope of testing and certificate

The provisions of DIN 10025-2, chapters 6.3 and 8 shall apply for delivery and inspection. Other inspections may be agreed.