Low-Carbon Steel: Hot-rolled - Pickled

Chemical Composition

Classification of symbols	Numerical classification	European Standard (EN)	Chemical Composition					
			Max. C	Max. Si	Max. Mn	Max. P	Max. S	Max. N
DD11	1.0332	EN 10111	0.12	-	0.600	0.045	0.045	-
DD13	1.0335	EN 10111	0.08	-	0.400	0.030	0.030	-
DD14	1.0389	EN 10111	0.08	-	0.350	0.025	0.025	-
S235JR	1.0037	EN 10025	0.17	-	1.40	0.045	0.045	0.009
S355JO	1.0553	EN 10025	0.20	0.55	1.60	0.040	0.040	0.009

Equivalents

Classification of symbols	Numerical classification	European Standard (EN)	Old designations	Approximate international equivalents					
				US (AISI)		Japan (JIS)		China (GB)	
DD11	1.0332	EN 10111		CS Type B	A1011	SPHD/ HR 1	G3131	08	GB/T 710
DD13									
DD14									
S235JR	1.0037	EN 10025	St37-2						
S355JO	1.0553	EN 10025	St52-3U						

Mechanical properties

Classification of symbols	Numerical classification	European Standard (EN)	MECHANICAL PROPERTIES AND HARDNESS REQUIREMENTS						
			R_{eL} N/mm²		Max. R_m N/mm²	Minimum elongation %			Mechanical properties guaranteed [1]
						L_0 = 80 mm		$L_0 = 5.65 \sqrt{S_0}$	
			1.5 ≤ e < 2	2 ≤ e ≤ 5		1.5 ≤ e < 2	> 2 ≤ e < 3	3 ≤ e ≤ 5	
DD11	1.0332	EN 10111	170 - 360	170 - 340	440	23	24	28	1 month
DD13	1.0335	EN 10111	170 - 330	170 - 310	400	28	29	33	6 months
DD14	1.0389	EN 10111	170 - 310	170 - 290	380	31	32	36	6 months

1) The guarantee and mechanical properties relate to the date on which the material was produced and in no case relate to the delivery date.

Classification of symbols	Numerical classification	European Standard (EN)	Minimum yield strength, R_{eH}, in N/mm² [2]	Tensile strength, R_m, in N/mm²		Minimum elongation in %					
			Nominal thickness, in mm	Nominal thickness, in millimetres		L_0 = 80 mm; Nominal thickness, in mm					$L_0 = 5.65 \sqrt{S_0}$ Nominal thickness, in mm
			≤ 5	< 3	≥ 3 ≤ 5	≤ 1	> 1 ≤ 1.5	> 1.5 ≤ 2	> 2 ≤ 2.5	> 2.5 < 3	≥ 3
S235JR	1.0037	EN 10025	235	360 - 510	340 - 470	17	18	19	20	21	26
						15	16	17	18	19	24
S355JO	1.0553	EN 10025	355	510 - 680	490 - 630	14	15	16	17	18	22
						12	13	14	15	16	20

Finishes

- The products covered by Standard EN 10111:1998 are suitable for surface coating.
- The type of coating must be indicated when placing the order.

Tolerances

THICKNESS TOLERANCES

Nominal thickness		Thickness tolerances according to EN 10051 for nominal widths of	
>	≤	≤ 1200	> 1200 ≤ 1500
-	2,00	± 0,13	± 0,14
2,00	2,50	± 0,14	± 0,16
2,50	3,00	± 0,15	± 0,17
3,00	4,00	± 0,17	± 0,18
4,00	5,00	± 0,18	± 0,20
5,00	6,00	± 0,20	± 0,21

Sizes in mm.
Thickness tolerances for sheets/plates made of steel with a normal deformation resistance at elevated temperatures (category A).

WIDTH TOLERANCES

Width tolerances for strips with sheared edges

Nominal thickness		Standard slitting tolerances for Metalle Schmidt [1)]				Width tolerances according to EN 10051 for nominal widths of	
>	≤						
-	2,00	on request	± 0,13	± 0,15	± 0,16	± 0,17	± 0,19
2,00	2,50	on request	± 0,13	± 0,15	± 0,16	± 0,18	± 0,21
2,50	3,00	on request	on request	± 0,16	± 0,175	± 0,20	± 0,22
3,00	4,00	on request	on request	± 0,16	± 0,175	± 0,22	± 0,24
4,00	6,00	on request	on request	± 0,16	± 0,175	± 0,24	± 0,26

Sizes in mm.

1) Other, closer dimensional tolerances on request.

EDGE CAMBER TOLERANCES

Nominal width(W)	Edge curve tolerances under commercial agreement	
	Maximum deviation 2000 mm Thickness (t)	
	t ≤ 1,20 mm	t > 1,20 mm
3 ≤ W < 6	10,00	15,00
6 < W ≤ 10	8,00	12,00
10 < W ≤ 20	4,00	6,00
20 < W ≤ 350	2,00	4,00

Sizes in mm.
Sag tolerances according to EN 10051 for pickled hot-rolled strips will be agreed when placing the order.

RIPPLE - LONGITUDINAL FLATNESS

The flatness tolerance of the strips in cut lengths in the direction of rolling must be a maximum of 10 mm on 1000 mm. Any other flatness requirement must be agreed when placing the order.