

3. Hot-rolled steel flats

3.2. HOT-ROLLED STEEL FOR EXPORT ACCORDING TO DOMESTIC AND INTERNATIONAL STANDARDS

Table 3.15. Shape and dimensional tolerances

Standard for technical specification	EN 10025	ASTM A 1011 (ASTM A 570) SAE J403	ASTM A 635 ASTM A 1018 (ASTM A 907)
Standard for product mix, geometry and tolerances	EN 10051 EN 10029	ASTM A 568	ASTM A 635

Previous standard designation is given in parenthesis.

Figure 3.9. Thickness-to-width relation

Strip thickness, mm	Strip width, mm							
	900	1280	1360	1440	1550	1640	1710	1850
1.45								
1.8								
2.0								
3.0								
4.0								
up to 14.0								

Hot-rolled material with other product mix requirements, including those in terms of thickness to width ratio may be produced on special order subject to an additional agreement.

3.2.6. Hot-rolled steel (strength class — 400 MPa)

Table 3.16. Mechanical properties of steel

Steel grade	Standard	Strip thickness, mm	Mechanical properties				
			Tensile strength MPa (N/mm ²)	Yield point MPa (N/mm ²)	Elongation%, min	Mandrel diameter at 180° bending	Impact energy J, min (T, °C)
36 type 1	ASTM A 1011 (ASTM A 570)	1.80 – 2.49	365 min	250	21	d=1.5a	...
36 type 1	ASTM A 1011 (ASTM A 570)	2.50 – 4.45	365 min	250	22	d=1.5a	...
36 type 2	ASTM A 1011 (ASTM A 570)	1.80 – 2.49	400–550	250	20	d=2.0a	...
36 type 2	ASTM A 1011 (ASTM A 570)	2.50 – 4.45	400–550	250	21	d=2.0a	...
36	ASTM A 1018 (ASTM A 907)	4.50 – 14.00	365 min	250	21	...	...
1017	ASTM A 659	1.80 – 4.45	...	...	...	d=2.0a	...
1017	ASTM A 635	4.50 – 14.00	...	...	...	...	...
SS 400	JIS G 3101	1.80 – 5.00	400–510	245	21	d=1.5a	...
SS 400	JIS G 3101	5.10 – 14.00	400–510	245	17	d=1.5a	...
SPHT3	JIS G 3132	1.80 – 2.90	410 min	...	22	d=1.5a	...
SPHT3	JIS G 3132	3.00 – 5.90	410 min	...	25	d=2.0a	...
SPHT3	JIS G 3132	6.00 – 14.00	410 min	...	27	d=2.0a	...

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a — strip thickness;
Previous standard designation is given in parenthesis.

On customer demand hot-rolled steel with agreed mechanical properties may be produced.

Table 3.17. Chemical composition of steel

Fraction of total mass, %									
C	Si	Mn	Al	S	P	Cr	Ni	Cu	N
0.14–0.20	0.15–0.30	0.40–0.60	0.02–0.07	0.035 max	0.030 max	0.15 max	0.20 max	0.20 max	0.008 max

For all steel grades under A1011 (ASTM A570) fraction of total mass of molybdenum, vanadium and niobium is determined, which must not exceed:

Mo — 0.06%; V — 0.008%; Nb — 0.008%

Total content of Cu, Cr, Ni and Mo must not exceed 0.50%, and Cr + Mo shall be 0.16% maximum.

For all steel grades under ASTM A1018 (ASTM A907) fraction of total mass of molybdenum, vanadium, niobium and titanium is determined, which must not exceed:

Mo — 0.06%; V — 0.008%; Nb — 0.008%, Ti — 0.008%

Total content of Cu, Cr, Ni and Mo must not exceed 0.50%, and Cr + Mo shall be 0.16% maximum.

For steel grade 1017 under ASTM A 635 and ASTM A 659 fraction of total mass of molybdenum, vanadium and niobium is determined, which must not exceed:

Mo — 0.06%; V — 0.008%; Nb — 0.008%

Total content of Cu, Cr, Ni and Mo must not exceed 0.50%.

Table 3.18. Shape and dimensional tolerances for hot-rolled steel

Standard for technical specification	ASTM A 659 ASTM A 1011 (ASTM A 570)	ASTM A 635 ASTM A 1018 (ASTM A 907)	JIS G 3101	JIS G 3132
Standard for product mix, geometry and tolerances	ASTM A 568	ASTM A 635	JIS G 3193	JIS G 3132 JIS G 3193

Previous standard designation is given in parenthesis.

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Figure 3.10. Thickness-to-width relation

Strip thickness, mm	Strip width, mm							
	900	1280	1360	1440	1550	1640	1710	1850
1.8								
1.9								
2.0								
3.0								
4.0								
up to 14.0								

Hot-rolled material with other product mix requirements, including those in terms of thickness to width ratio may be produced on special order subject to an additional agreement.

3.2.7. Hot-rolled steel (strength class — 430 MPa)

Table 3.19. Mechanical properties of steel

Steel grade	Standard	Strip thickness, mm	Mechanical properties				
			Tensile strength MPa (N/mm ²)	Yield point MPa (N/mm ²)	Elongation%, min	Mandrel diameter at 180° bending	Impact energy J, min (T, °C)
S275JR	EN 10025:2-2004	1.80 – 2.90	430–580	275	15–17**	d=3.0–4.0 mm	27 (+20)
S275JR	EN 10025:2-2004	3.00 – 14.00	410–560	275	21	d=4.0–28 mm	27 (+20)
40	ASTM A 1011 (ASTM A 570)	1.80 – 2.49	380 min	275	20	d=2.0a	...
40	ASTM A 1011 (ASTM A 570)	2.50 – 4.45	380 min	275	21	d=2.0a	...
40	ASTM A 1018 (ASTM A 907)	4.50 – 14.00	380 min	275	21	...	...
1020	ASTM A 659	1.80 – 4.45	...	...	...	d=2.0a	...
1020	ASTM A 635	4.50 – 14.00	...	...	...	...	...
	ASTM A 36	4.50 – 14.00	400–550	250	23	...	...

... — parameter not limited by standard

a — strip thickness.

* — impact energy with sample width of 5.0–9.9 mm for steels S275JR under EN 10025 corresponds to St 44-2 under DIN 17100

** — depending on strip thickness.

Previous standard designation is given in parenthesis.

When ordering hot-rolled steel under EN 10025 letter “N” is added to the steel grade name for normalized rolled steel.

On customer demand hot-rolled steel with agreed mechanical properties may be produced.