

3. Hot-rolled steel flats

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

3.2.8. Hot-rolled steel (strength class — 450 MPa)

Table 3.22. Mechanical properties of steel

Steel grade	Standard	Thickness, mm	Mechanical properties				
			Tensile strength MPa (N/mm ²)	Yield point MPa (N/mm ²), min	Elongation%, min	Mandrel diameter at 180° bending	Impact energy J, min (T, °C)
St3Gsp	GOST 380–94*	2.00 – 3.90
St3Gsp	GOST 14637–89	4.00 – 14.00	390–570	255	23	d=1.5a	...
45	ASTM A 1011 (ASTM A 570)	2.00 – 2.49	410 min (415)	310	18	d=2.0a	...
45	ASTM A 1011 (ASTM A 570)	2.50 – 4.45	410 min (415)	310	19	d=2.0a	...

... — parameter not limited by standard

a — strip thickness.

* — chemical composition only.

Previous standard designation and previous tensile strength value are given in parenthesis.

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

Table 3.23. 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	0.85–1.10	0.02–0.07	0.035 max	0.030 max	0.15 max	0.20 max	0.20 max	0.008 max

For steel grade 45 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.

Table 3.24. Shape and dimensional tolerances

Standard for technical specification	ASTM A 1011 (ASTM A 570)
Standard for product mix, geometry and tolerances	ASTM A 568

Previous standard designation is given in parenthesis.

Figure 3.12. Thickness-to-width relation

Strip thickness, mm	Strip width, mm							
	900	1280	1360	1440	1550	1640	1710	1850
2.0								
3.5								
4.0								
5.0								
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.