

NLMK

HOT-ROLLED STEEL



**PRODUCT
CATALOGUE**

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ABOUT NLMK

Russia's No. 1 producer of steel, NLMK Group supplies products to sectors of the economy: from power engineering, petrochemical, pipe making, shipbuilding and construction through to manufacturing of railway transport, mining machinery, trucks, passenger cars, and yellow and white goods.

WHY NLMK

1. Reliability and quality guarantee

Our business model allows us to control the quality of our products at each stage: from the mining of raw materials to finished product manufacturing and servicing. Self-sufficiency in raw material and energy supplies ensures stability of our operations and unfailing delivery of all commitments to our partners.

2. A wide product mix

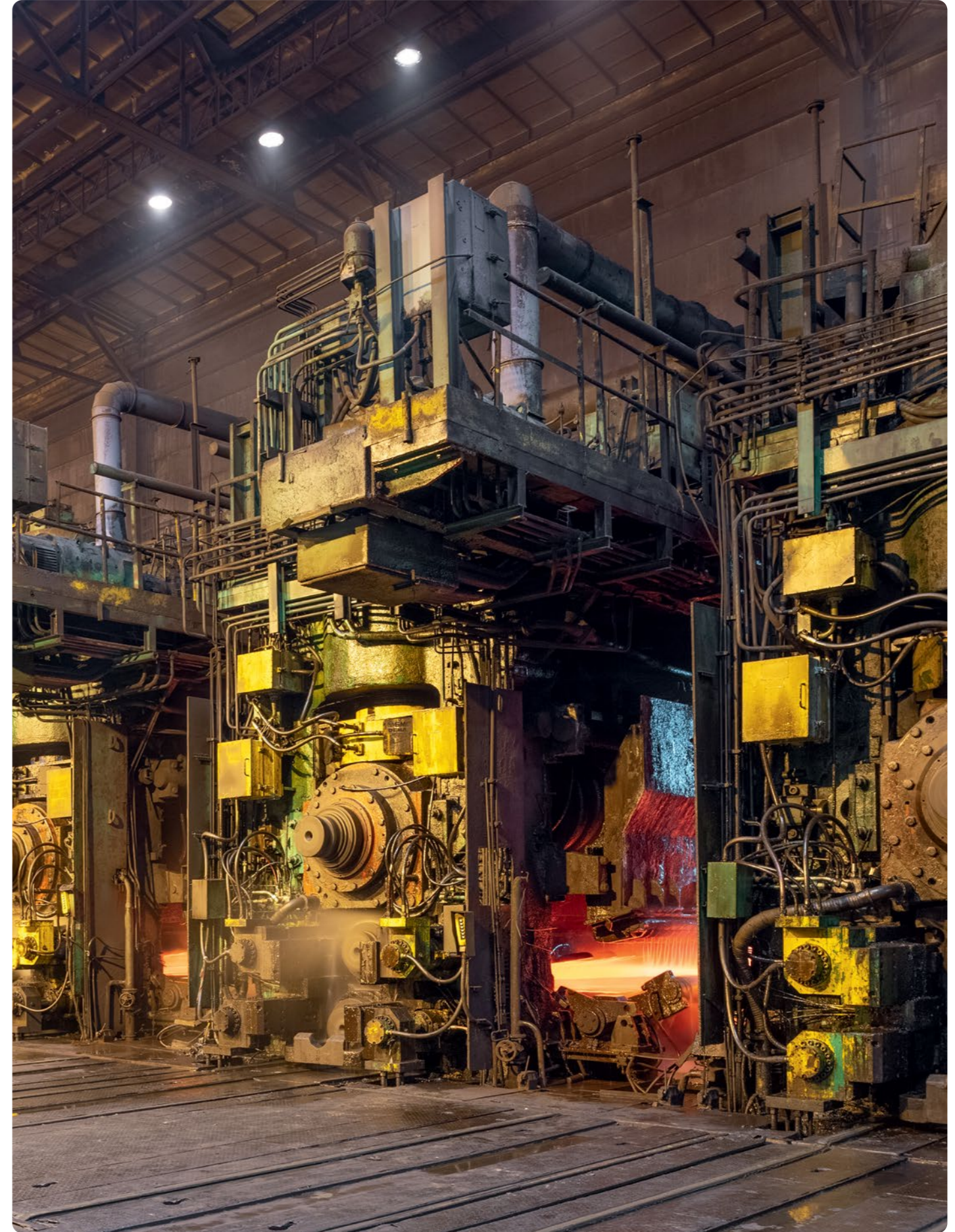
NLMK Group produces a wide range of steel products: from semi-finished products and standard grades to high-tech electrical steels. We also offer our clients made-to-order customization to match their individual specifications.

3. Strong team with a customized approach

Our customer service model relies on NLMK Trading House and NLMK.shop, which enables direct engagement with any type of business. We offer a unique proposition in servicing and logistical capabilities, with a guarantee of high and stable product quality.

4. Long-standing expertise in steelmaking

NLMK's success is driven by 90 years' worth of experience in the market and by our continuous efforts in designing new products and deploying digital technologies in production. Our digitalisation projects are widely acclaimed by market experts and recognized with specialised awards.





NLMK's hot-rolled products serve as inputs for all downstream manufacturing and their quality is ensured with tried-and-true production technologies. The main advantages of our hot-rolled products rely on the metal structure, where 60% of the quality is accounted for by the input semi-finished products: NLMK slabs that determine the chemical composition, purity and surface quality. There are tomographic and X-ray systems in place to monitor strict adherence to the requirements: each grade of steel is cooled at a certain rate and to the desired and pre-determined temperature. This ensures such end-user parameters as strength, stampability, ductility, and the potential for specialized magnetic properties.

Alongside standard catalogue products, NLMK offers customization, whereby customers can place orders for rolled steel with a unique geometry thanks to the continuously variable crown system.

Hot-rolled products are in high demand by oil-and-gas pipe makers (including low-temperature and high-pressure pipes), as well as construction and mechanical engineering, including shipbuilding, car manufacturing and white goods.

OUR ADVANTAGES

- Exceptional flatness
- Unique geometries made to order



Applications

- Construction and mining machinery
- Automotive industry
- Agricultural machinery
- Construction and finishing
- Shipbuilding
- Pipe industry
- Oil and gas industry
- Railroad machinery



PRODUCT MIX

- Commercial hot-rolled steel
- Hot-rolled steel for further drawing
- Rolled steel of 300, 350, 400, 450 and 500 Strength Classes
- Hot-rolled microalloyed steel with high yield strength for cold stamping as per EN 10149-2
- Foreign equivalents of domestic steel grades

- Rolled products can be shipped in coils,
- slitted and coiled, or as sheets.

HOT-ROLLED STEEL

Rolled product thickness	1.45–16.00 mm
Rolled product width	900–1,850 mm
Coil outer diameter	1,000–2,300 mm
Coil inner diameter	850 ± 10 mm
Weight of commercial coils	up to 36 t
Sheet length	2,500–12,000 mm
Weight of sheet bundles	up to 12 t
Rolled product width after slitting	100–1,850 mm
Inner diameter of coils after slitting	850 ± 10, 750 ± 10 mm

HR P&O STEEL

Rolled product thickness	1.45–4.5 mm
Rolled product width	900–1,850 mm
Coil outer diameter	1,250–2,250 mm
Weight of commercial coils	up to 36 t
Sheet length	2,500–12,000 mm
Weight of sheet bundles	up to 12 t
Rolled product width after slitting	100–1,500 mm
Inner diameter of coils after slitting	750 ± 10, 850 ± 10 mm

HRPO TEMPERED STEEL

Rolled product thickness	1.45–3.5 mm
Rolled product width	900–1,850 mm
Coil outer diameter	1,200–2,200 mm
Coil inner diameter	600 + 5 mm
Weight of commercial coils	up to 36 t
Sheet length	1,000–6,000 mm
Weight of sheet bundles	up to 10 t
Rolled product width after slitting	100–1,800 mm
Inner diameter of coils after slitting	600 ± 10 mm
Degree of strip reduction (depending on steel thickness)	1.4 ± 0.2% + 2.7 ± 0.2%

Depending on the product type, minimum dimensional tolerances are equivalent to 1/2 or 2/3 of EN 10051 (GOST 19903). Non-flatness of rolled sheets conforms to standard tolerances as per EN 10051 (GOST 19903).

Rolled products with other specified requirements, including for thickness/width ratio, are available upon request.

COMMERCIAL ROLLED STEEL

BASIC STEEL GRADE 08ps (08nc) as per GOST 1050

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending			
08ps (08nc)	GOST 16523	1.5–2.0	270–410	/	≥ 24	0a			
		2.1–3.9			≥ 26	1.0a			
08ps (08nc)	GOST 1577	4.0–14.0	≥ 274	0	≥ 32	0.5a			
		DD11					EN 10111	1.45–1.99	≤ 440
CS Type A	ASTM A 1011	1.5–5.99	/	/	/	/			
	ASTM A 569								
	ASTM A 1018	6.00–14.00							
	ASTM A 830								
1008	SAEJ403	1.45–14.00	/	/	/	/			
SPHC	JIS G 3131	1.45–1.59	≥ 270	/	≥ 27	0a			
		1.60–3.19			≥ 29	0a			
		3.20–14.0			≥ 31	0.5a			
St22	DIN 1614-1	1.45–8.0	/	/	/	/			
StW22	DIN 1614-2	1.80–1.99	0	/	0	/			
		2.00–2.99					≤ 440	≥ 25	/
		3.00–12.0					≥ 29	/	

/ – parameter is not regulated by the standard

0 – as agreed by the parties

a – rolled product thickness

Relative elongation for steel of grade DD11, thickness 3–8 mm, is determined on samples with initial length of

$l_0 = 5.65\sqrt{S_0}$,

where S_0 is a cross-section area.

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 16523 GOST 1577	DIN 1614-1 DIN 1614-2	SAEJ403 ASTM A 1011 ASTM A 1018 ASTM A 830	JIS G 3131	JIS G 3132
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	EN 10051 (DIN 1016)	ASTM A 568 ASTM A 635	JIS G 3131 JIS G 3193	JIS G 3132 JIS G 3193

Note. The previous designation of the standard is given in brackets.

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.45–1.89															
1.90–2.49															
2.50–2.99															
3.00–3.19															
≥ 3.20															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

ROLLED STEEL FOR DRAWING

BASIC STEEL GRADE 08Yu (08Ю) as per GOST 9045 (C ≤ 0.06%)

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending
08ps (08nc)	GOST 9045*	1.45-14.0	/	/	/	/
CS Type A, B, C	ASTM A 1011	1.45-5.99	/	/	/	/
DD11	EN 10111	3.51-8.00	≤ 440	170-340	≥ 28	
SPHT1	JIS G 3132	1.80-2.99	≥ 275	/	≥ 32	0a
		3.00-5.99	≥ 275	/	≥ 35	0.5a
		6.00-13.00	≥ 275	/	≥ 37	0.5a
HR4	BS1449	3.51-10.00	≥ 280	≥ 170	≥ 25	2.0a
1006	SAE J403	1.45-14.00	/	/	/	/
	ASTM A 830	6.00-14.00	/	/	/	/
RRS123	DIN 1614-1	1.45-8.0	/	/	/	/
RRS1W23	DIN 1614-2	1.5-2.9	≤ 420	/	≥ 27	/
		3.0-8.0	≤ 420	/	≥ 31	/
		8.1-14.0	/	/	/	/

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 9045	EN 10111	ASTM A 635	SAE J403	DIN 1614-1 DIN 1614-2
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	EN 10051	ASTM A 635	ASTM A 568	DIN 1016

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.45-1.89															
1.90-2.49															
2.50-2.99															
3.00-3.19															
≥ 3.20															

* only chemical composition
/ – parameter is not regulated by the standard

a – rolled product thickness
Relative elongation for steel of grade DD11, thickness 3-8 mm, is determined on samples with initial length of $l_0 = 5.65\sqrt{S_0}$, where S_0 is a cross-section area.

Steel with customized mechanical properties is available upon request.

Rolled products with customized properties, including thickness/width ratio, are available upon request.

SPECIALLY DEOXIDIZED ROLLED STEEL FOR DRAWING

BASIC STEEL GRADE 08Yu (08Ю) as per GOST 9045 (C < 0.05%)

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending
08Yu (08Ю)	GOST 9045*	1.5-14.0	/	/	/	/
08Yu (08Ю)	GOST 1577	4.0-14.0	≥ 310	/	≥ 34	/
DS Type A, B	ASTM A 1011	1.45-5.99	/	/	/	/
1006	SAE J 403	1.45-14.00	/	/	/	/
DD12	EN 10111	1.45-1.99	≤ 420	170-340	≥ 25	
		2.00-2.99		170-320	≥ 26	
		3.00-8.00		170-320	≥ 30	
DD13	EN 10111	1.45-1.99	≤ 400	170-330	≥ 28	
		2.00-2.99		170-310	≥ 29	
		3.00-8.00		170-310	≥ 33	
DD14	EN 10111	1.45-1.99	≤ 380	170-310	≥ 31	
		2.00-2.99		170-290	≥ 32	
		3.00-8.00		170-290	≥ 36	
St24	DIN 1614-1	1.45-8.0	/	/	/	/
StW24	DIN 1614-2	1.80-1.99	≤ 410	≤ 320	/	/
		2.00-2.99			≥ 30	
		3.00-8.00			≥ 34	
SPHD	JIS G 3131	1.80-1.99	≥ 270	/	≥ 32	/
		2.00-2.49			≥ 33	
		2.50-3.19			≥ 35	
		3.20-3.99			≥ 37	
SPHE	JIS G 3131	1.80-1.99	≥ 270	/	≥ 33	/
		2.00-2.49			≥ 35	
		2.50-3.19			≥ 37	
		3.20-3.99			≥ 39	
		4.00-14.0			≥ 39	
		4.00-14.0			≥ 41	

* only chemical composition
/ – parameter is not regulated by the standard

a – rolled product thickness
Relative elongation for rolled steel grades DD12, DD13, DD14, thickness 3-8 mm, is determined on samples with initial length of $l_0 = 5.65\sqrt{S_0}$, where S_0 is a cross-section area.

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 9045	GOST 1577	EN 10111	SAE J403 ASTM A 1011 ASTM A 1018 ASTM A 830	DIN 1614-1 DIN 1614-2
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	GOST 19903	EN 10051	ASTM A 568 ASTM A 635	DIN 1016

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.45-1.89															
1.90-2.49															
2.50-2.99															
3.00-3.19															
≥ 3.20															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 300 MPA

BASIC STEEL GRADE 10 as per GOST 1050

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending
10	GOST 16523	1.5-3.9	300-480	/	≥ 23	1.0a
10	GOST 1577	4.0-14.0	≥ 290	/	≥ 32	0.5a
30	ASTM A 1011	1.45-1.59	≥ 340	≥ 205	≥ 21	1.0a
		1.60-2.49			≥ 24	
		2.50-5.99			≥ 25	
	ASTM A 1018	6.00-8.00			≥ 22	/
		8.01-14.00			≥ 17	
B	ASTM A 283	6.00-8.00	≥ 345-450	≥ 185	≥ 28	/
		8.01-14.00			≥ 25	
1010	SAEJ403	1.45-14.00	/	/	/	/
1010	ASTM A 830	6.00-14.00	/	/	/	/
SPHT2	JIS G 3132	1.8-2.99	≥ 343	/	≥ 27	1.0a
		3.00-5.99			≥ 30	1.5a
		6.00-13.00			≥ 32	1.5a

/ – parameter is not regulated by the standard

o – as agreed by the parties

a – rolled product thickness

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 16523 GOST 1577	SAEJ403 ASTM A 1011 ASTM A 1018 ASTM A 830	JIS G 3132
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	ASTM A 568 ASTM A 635	JIS G 3132 JIS G 3193

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.45-1.99															
2.00-2.49															
2.50-2.99															
3.00-3.49															
3.50-3.99															
> 4.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 350 MPA

BASIC STEEL GRADE St2sp (Cr2cn) as per GOST 380

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J
Cr2cn	GOST 16523	1.5-3.9	300-480	/	≥ 23	1.0a	/
	GOST 14637	4.0-14.0	330-480	≥ 225	≥ 32	1.5a	/
S235JR, S235JRC	EN 10025:2	1.45-1.50	360-510	≥ 235	≥ 16	**	/
		1.51-2.00			≥ 17		
		2.01-2.50			≥ 18		
		2.51-2.99			≥ 19		
		3.00-9.99			≥ 24		
		10.00-15.00					≥ 27 (+20 °C)*
S235J0, S235J0C, S235J0W	EN 10025:2	1.45-1.50	360-510	≥ 235	≥ 16	**	/
		1.51-2.00			≥ 17		
		2.01-2.50			≥ 18		
		2.51-2.99			≥ 19		
		3.00-9.99			≥ 24		
		10.00-15.00					≥ 27 (0 °C)*
S235J2, S235J2C, S235J2W, S235J2WP	EN 10025:2	1.45-1.50	360-510	≥ 235	≥ 16	**	/
		1.51-2.00			≥ 17		
		2.01-2.50			≥ 18		
		2.51-2.99			≥ 19		
		3.00-9.99			≥ 24		
		10.00-15.00					≥ 27 (-20 °C)*
33	ASTM A 1011	1.45-1.60	≥ 360	≥ 230	≥ 18	1.0a	/
		1.61-2.50			≥ 22		
		2.51-6.00			≥ 23		
	ASTM A 1018	4.50-8.00			≥ 16	1.0a	/
		8.01-14.00			≥ 22		
1012	SAEJ403	1.45-14.00	/	/	/	/	

/ – parameter is not regulated by the standard

a – rolled product thickness

* impact energy for sample width over 10 mm

** depending on rolled product thickness

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 16523 GOST 14637	EN 10025	ASTM A 1011 SAE J403	ASTM A 1018
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	EN 10051 EN 10029	ASTM A 568	ASTM A 635

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.45-1.99															
2.00-2.49															
2.50-2.99															
3.00-3.49															
3.50-3.99															
> 4.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 400 MPA

BASIC STEEL GRADE St3sp (Ст3сп) as per GOST 380

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J
St3sp (Ст3сп)	GOST 16523	1.8-2.0	360-530	/	≥ 20	1.0a	/
	GOST 16523	2.1-3.9	360-530	/	≥ 22	2.0a	/
	GOST 14637	4.0-14.0	370-480	/	≥ 26	1.5a	/
36 Type 1	ASTM A 1011	1.80-5.99	≥ 365	≥ 250	≥ 22	1.5a	/
36	ASTM A 1018	6.00-8.00	≥ 365	≥ 250	≥ 15	/	/
		8.01-14.00			≥ 21		
1015	ASTM A 659	1.80-5.99	/	/	/	2.0a	/
	ASTM A 830	6.00-14.00				/	
1017	ASTM A 659	1.80-5.99				2.0a	/
SS400	JIS G 3101	1.80-5.00	400-510	≥ 245	≥ 21	1.5a	/
		5.01-14.0			≥ 17		
C	ASTM A 283	4.50-8.00	380-515	≥ 205	≥ 25	/	/
		8.01-14.00			≥ 22		
P265NB	EN 10120:2008	2.00-2.99	≥ 265	410-500	≥ 24	/	/
SG295	JIS G 3116:2013	2.00-2.99	≥ 295	≥ 440	≥ 26	1.5a	/

/ – parameter is not regulated by the standard

a – rolled product thickness

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 16523 GOST 14637	ASTM A 659 ASTM A 1011	ASTM A 1018	JIS G 3101	JIS G 3132
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	ASTM A 568	ASTM A 635	JIS G 3193	JIS G 3132 JIS G 3193

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm															
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850	
1.45-1.99																
2.00-2.49																
2.50-2.99																
3.00-3.99																
> 4.00																

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 430 MPA

BASIC STEEL GRADE 20 as per GOST 1050

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J	
20, 20ps (20nc)	GOST 16523	1.8-2.0	350-500	/	≥ 22	0a	/	
		2.1-3.9	350-500	/	≥ 23	1.0a	/	
		4.0-14.0	≥ 370	/	≥ 28	1.0a	/	
		4.0-12.0	340-490	/	≥ 28, 24	a	/	
S275JR, S275JRC	EN 10025:2	1.80-2.00	430-580	≥ 275	≥ 15	**	/	
		2.01-2.50			≥ 16			
		2.51-2.99			≥ 17			
		3.00-9.99	410-560		≥ 21		≥ 27 (+20)*	
S275J0, S275J0C	EN 10025:2	1.80-2.00	430-580	≥ 275	≥ 15	**	/	
		2.01-2.50			≥ 16			
		2.51-2.99			≥ 17			
		3.00-9.99	410-560		≥ 21		≥ 27 (0)*	
S275J2, S275J2C	EN 10025:2	1.80-2.00	430-580	≥ 275	≥ 15	**	/	
		2.01-2.50			≥ 16			
		2.51-2.99			≥ 17			
		3.00-9.99	410-560		≥ 21		≥ 27 (-20)*	
40	ASTM A 1011	1.8-4.45	≥ 380	≥ 275	≥ 21	2.0a	/	
		ASTM A 1018	4.50-8.00	≥ 380	≥ 275	≥ 19	/	/
			8.00-14.0			≥ 14	/	/
1020	ASTM A 659	1.80-4.45	/	/	/	2.0a	/	
		ASTM A 635 ASTM A 830	4.50-14.0			/		
SPHT3	JIS G 3132	1.80-2.99	≥ 412	/	≥ 22	1.5a	/	
		3.00-5.99			≥ 25	2.0a		
		6.00-13.00			≥ 27			
-	ASTM A 36	4.5-8.00	400-550	≥ 250	≥ 23	/	/	
		8.01-16.00			≥ 20			

/ – parameter is not regulated by the standard

a – rolled product thickness

* impact energy for sample width over 10 mm

** depending on rolled product thickness

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 16523 GOST 14637	EN 10025	ASTM A 659 ASTM A 1011 ASTM A 659	ASTM A 635 ASTM A 1018
Standard for product mix, geometrical dimensions and tolerances	GOST 19903	EN 10051 EN 10029	ASTM A 568	ASTM A 635

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm															
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850	
1.45-1.99																
2.00-2.49																
2.50-2.99																
3.00-3.99																
> 4.00																

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 450 MPA

BASIC STEEL GRADE St3Gsp (Ст3Гсп) as per GOST 380

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J
St3Gsp (Ст3Гсп)	GOST 380*	2.0-3.9	/	/	/	/	/
	GOST 14637	4.0-14.0	390-570	255	≥ 23	1.5a	/
45	ASTM A 1011	1.80-2.49	≥ 410	≥ 310	≥ 18	2.0a	/
		2.50-6.00			≥ 19		
P310NB	EN 10120	1.80-2.49	460-550	≥ 310	≥ 21	/	/

* only chemical composition
/ – parameter is not regulated by the standard
a – rolled product thickness

At the customer's request, hot-rolled steel for drawing can be supplied with agreed mechanical properties.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 380 GOST 14637	ASTM A 1011
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Standard for product mix, geometrical dimensions and tolerances	GOST 19903	ASTM A 568
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THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.50-1.79															
1.80-2.99															
3.00-3.99															
4.00-4.99															
5.00-5.99															
> 6.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

STRENGTH CLASS 500 MPA

BASIC STEEL GRADE 17GS (17ГС)

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J
17GS (17ГС)	GOST 17066	3.0-3.9	≥ 510	/	≥ 19	2.0a	/
	GOST 19281	4.0-14.0	≥ 490	≥ 345	≥ 21	2.0a	0
09G2S (09Г2С)	GOST 17066	3.0-3.9	≥ 510	/	≥ 19	2.0a	/
	GOST 19281	4.0-14.0	≥ 490	≥ 345	≥ 21	2.0a	0
S355JR, S355JRC	EN 10025:2	1.50	510-680	≥ 355	≥ 13	**	/
		1.51-2.00			≥ 14		
		2.01-2.50			≥ 15		
		2.51-2.99			≥ 16		
		3.00-15.00	470-630		≥ 20		≥ 27 (+20)*
S355JO, S355JOC	EN 10025:2	1.50	510-680	≥ 355	≥ 13	**	/
		1.51-2.00			≥ 14		
		2.01-2.50			≥ 15		
		2.51-2.99			≥ 16		
		3.00-15.00	470-630		≥ 20		≥ 27 (0)*
S355J2, S355J2C, S355J2W	EN 10025:2	1.50	510-680	≥ 355	≥ 13	**	/
		1.51-2.00			≥ 14		
		2.01-2.50			≥ 15		
		2.51-2.99			≥ 16		
		3.00-15.00	470-630		≥ 20		≥ 27 (-20)*
50	ASTM A 1011	3.0-5.99	≥ 450	≥ 345	≥ 17	2.5a	/
55	ASTM A 1011	3.0-5.99	≥ 480	≥ 380	≥ 15	3.0a	/
SS490	JIS G 3101	1.50-5.00	490-610	≥ 285	≥ 19	2.0a	/
		5.01-15.00			≥ 15		/

/ – parameter is not regulated by the standard

a – rolled product thickness

0 – as agreed by the parties

** depending on rolled product thickness

* minimum impact energy values depend on the sample width

Steel with customized mechanical properties is available upon request.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

Standard for specification	GOST 17066 GOST 19281	EN 10025	ASTM A 1011	JIS G 3101
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Standard for product mix, geometrical dimensions and tolerances	GOST 19903	EN 10051 EN 10029	ASTM A 568	JIS G 3193
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THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.50-1.79															
1.80-2.99															
3.00-3.99															
4.00-4.99															
5.00-5.99															
> 6.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

MICROALLOYED ROLLED STEEL FOR COLD FORMING AS PER EN 10149-2

MECHANICAL PROPERTIES

Steel grade	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %		Mandrel diameter at 180° bending
			δ ₅	δ ₁₀	
S315MC	390-510	315	≤ 20	≤ 24	0a
S355MC	430-550	355	≤ 19	≤ 23	0.5a
S420MC	480-620	420	≤ 16	≤ 19	0.5a
S460MC	520-670	460	≤ 14	≤ 17	1.0a
S500MC	550-700	500	≤ 12	≤ 14	1.0a
S550MC	600-760	550	≤ 12	≤ 14	1.5a

a – rolled product thickness

Steel with customized mechanical properties is available upon request.

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

• S315MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,640	1,700	1,850
1.50-1.79															
1.80-2.99															
3.00-3.99															
4.00-4.99															
5.00															

• S355MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,640	1,700	1,850
1.50-1.79															
1.80-2.49															
2.50-2.99															
3.00-3.99															
4.00-4.99															
5.00-15.00															

• S420MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,290	1,350	1,400	1,450	1,500	1,550	1,600	1,640	1,700	1,850
1.75-1.79															
1.80-2.29															
2.30-2.99															
3.00-3.99															
4.00-4.99															
5.00-15.00															

• S460MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,290	1,350	1,400	1,450	1,515	1,550	1,600	1,640	1,700	1,850
2.00-2.29															
2.30-2.99															
3.00-3.50															
3.51-3.90															

• S500MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,640	1,700	1,850
3.00-3.49															
3.50-3.99															
4.00-5.00															

• S550MC

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,640	1,700	1,850
4.00-5.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.



ROLLED STEEL FOR SHIPBUILDING

GOST R 52927-2015

CHEMICAL COMPOSITION

Steel grade	C	Si	Mn	S	P	Al	Cr	Ni	Cu	Ti	N	V	Nb	Mo	As	CEV, %
A, B, D	0.14-0.21	0.15-0.30	0.60-1.00	≤ 0.025	≤ 0.025	0.020-0.060	≤ 0.10	≤ 0.10	≤ 0.10	≤ 0.010	≤ 0.008	≤ 0.010	≤ 0.010	≤ 0.020	≤ 0.020	≤ 0.40
E	0.14-0.18	0.15-0.30	0.60-1.00	≤ 0.015	≤ 0.015	0.020-0.060	≤ 0.10	≤ 0.10	≤ 0.10	≤ 0.010	≤ 0.008	≤ 0.010	≤ 0.010	≤ 0.020	≤ 0.020	≤ 0.40
A32, D32, E32	0.11-0.15	0.15-0.25	1.35-1.50	≤ 0.010	≤ 0.015	0.020-0.060	≤ 0.10	≤ 0.10	≤ 0.10	≤ 0.010	≤ 0.008	≤ 0.010	≤ 0.010	≤ 0.020	≤ 0.020	≤ 0.42
D36, A40, D40	0.11-0.15	0.15-0.25	1.10-1.30	≤ 0.010	≤ 0.015	0.020-0.060	≤ 0.10	≤ 0.10	≤ 0.10	≤ 0.010	≤ 0.008	≤ 0.010	0.020-0.035	≤ 0.020	≤ 0.020	≤ 0.42

MECHANICAL PROPERTIES

Steel grade	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation**, %		
A, B, D, E	400-520	≥ 235	≥ 22		
A32, D32, E32	440-570	≥ 315	≥ 22		
D36	490-630	≥ 355	≥ 21		
A40, D40	510-640	≥ 390	≥ 20		

* For steels with physical yield strength the upper yield strength is defined. The conditional yield point for steels without a physical yield point is $\sigma_{0.2}$.

** Effective length $L=5,65\sqrt{F}$, mm.

IMPACT WORK REQUIREMENTS

Steel grade	Thickness, mm	Impact work KV, J		
		0 °C	-20 °C	-40 °C
A	4.00-12.00	-	-	-
B	5.00-7.49	≥ 19	-	-
	7.50-9.99	≥ 24	-	-
	10.00-12.00	≥ 27	-	-
D	5.00-7.49	-	≥ 19	-
	7.50-9.99	-	≥ 24	-
	10.00-12.00	-	≥ 27	-
E	5.00-7.49	-	-	≥ 19
	7.50-9.99	-	-	≥ 24
	10.00-12.00	-	-	≥ 27
A32*	5.00-7.49	≥ 22	-	-
	7.50-9.99	≥ 26	-	-
	10.00-12.00	≥ 31	-	-
D32	5.00-7.49	-	≥ 22	-
	7.50-9.99	-	≥ 26	-
	10.00-12.00	-	≥ 31	-
E32	5.00-7.49	-	-	≥ 22
	7.50-9.99	-	-	≥ 26
	10.00-12.00	-	-	≥ 31
D36	5.00-7.49	-	≥ 24	-
	7.50-9.99	-	≥ 28	-
	10.00-12.00	-	≥ 34	-
A40	5.00-7.49	≥ 26	-	-
	7.50-9.99	≥ 33	-	-
	10.00-12.00	≥ 39	-	-
D40	5.00-7.49	-	≥ 26	-
	7.50-9.99	-	≥ 33	-
	10.00-12.00	-	≥ 39	-

* Rolled steel less than 5.00 mm thick is subjected to impact bending tests at the consumer's request.

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

• A

Thickness, mm	Strip width, mm													
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700
4.00-4.99	-													
5.00-5.99	-													
6.00-12.00	-													

• B, D, E

Thickness, mm	Strip width, mm													
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700
5.00-5.99	-													
6.00-12.00	-													

• A32, D32, E32

Thickness, mm	Strip width, mm													
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700
4.00-4.99	-													
5.00-5.99	-													
6.00-12.00	-													

• D36, A40, D40

Thickness, mm	Strip width, mm													
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700
5.00-5.99	-													
6.00-12.00	-													

ROLLED STRUCTURAL WEATHERING STEEL AS PER EN 10025-5:2004

MECHANICAL PROPERTIES

Steel grade	Standard	Thickness, mm	Ultimate strength, MPa (N/mm ²)	Yield strength, MPa (N/mm ²)	Relative elongation, %	Mandrel diameter at 180° bending	Impact energy, J
S235J0W	EN 10025	1.50-1.79	360-510	≥ 235	≥ 19	≥ 3.3a	/
		3.00-12.00	360-510	≥ 235	≥ 26	≥ 3.3a	≥ 27

* only chemical composition
/ – parameter is not regulated by the standard
a – rolled product thickness

At the customer's request, hot-rolled steel for drawing can be supplied with agreed mechanical properties.

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

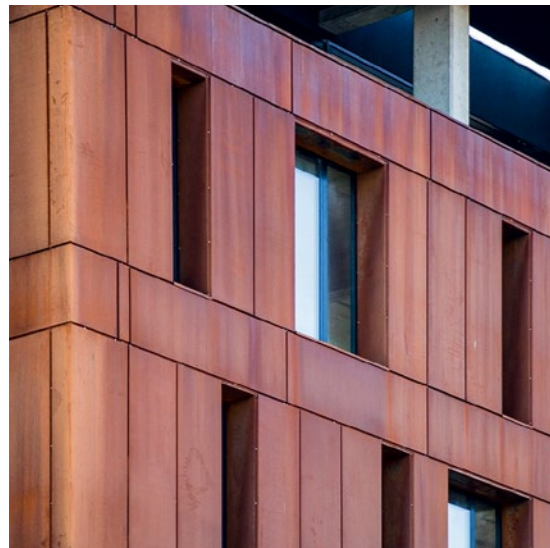
Standard for specification EN 10025

Standard for product mix, geometrical dimensions and tolerances EN 10051 EN 10029

THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
1.50-1.79															
3.00-3.49															
3.50-3.99															
4.00-12.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.



ROLLED STEEL WITH DIAMOND TREAD PATTERN AS PER ASTM A 786-09/A 786M-09, DIN 59220:2000, GOST 8568-77

TOLERANCES FOR DIMENSIONS AND SHAPE OF ROLLED PRODUCTS

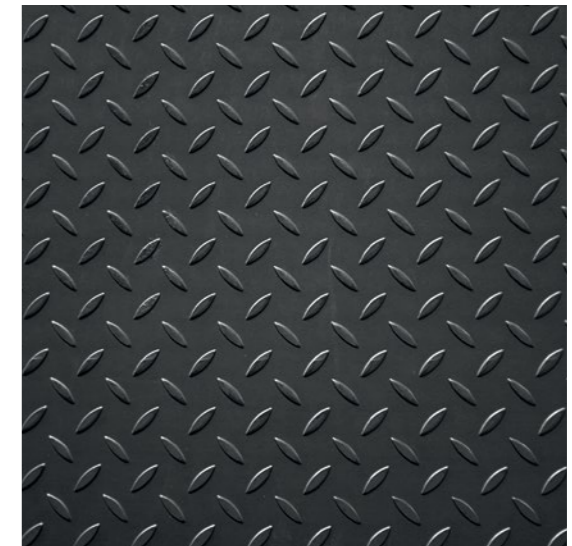
Standard for specification	GOST 8568, GOST 19903	ASTM A 786/A 786M, ASTM A 1011/A 1011M	DIN 59220	JIS G 3101	ASTM A 786/A 786M, ASTM A 36/A 36M, ASTM A 1018/A 1018M, BS 4360
Standard for product mix, geometrical dimensions and tolerances	GOST 8568, GOST 19903	ASTM A 568/A 568M, ASTM A 786/A 786M	DIN 59220	JIS G 3193	ASTM A 786/A 786M, ASTM A 6/A 6M, ASTM A 635/A 635M

Thickness certification is performed in line with requirements of the contract (agreement).

SPECIAL REQUIREMENTS

Steel grade	Standard	Riffle height*, mm
RSt 37-2, S235JR, S235JRG2, S235J0, S235J0, St 44-2, S275JR	DIN 59220	1.0-2.0
SS 400	JIS G 3101**	–
SS 36 Type 1/ SS 250 Type 1, steel as per ASTM A 36/A 36M, 43A, SS 40/SS 275	ASTM A 786, ASTM A 786M	–
Ct2cn, Ct2nc, Ct3cn, Ct3nc	GOST 8568	0.5-3.6***

* For orders as per DIN 59220:2000, JIS G 3101:2010, and ASTM A 786-09/A 786M-09, a riffle height of 0.6 mm or more needs to be approved
** Requirements of JIS G 3101:2010 apply to rolled products without ruffling
*** To be determined by the formula: $(0.1+0.3) \times h$, where h is a nominal thickness of rolled products; the minimum value is 0.5 mm

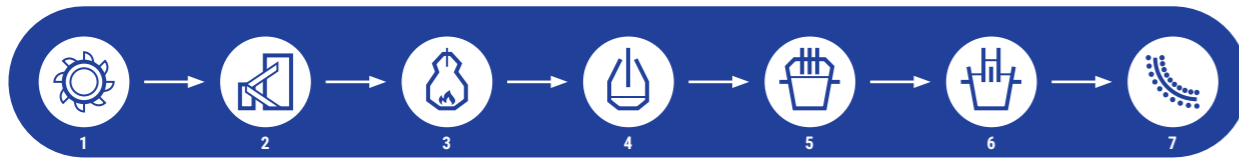


THICKNESS/WIDTH RATIO FOR ROLLED PRODUCTS

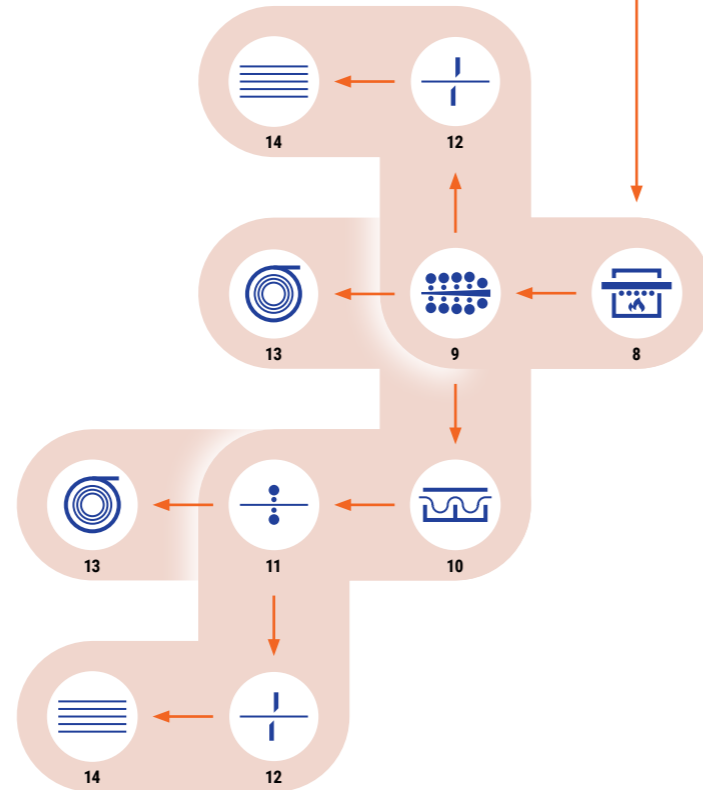
Thickness, mm	Strip width, mm														
	900	1,000	1,100	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,850
2.50-2.99															
3.00-3.99															
4.00-4.99															
5.00-5.99															
6.00-12.00															

Rolled products with customized properties, including thickness/width ratio, are available upon request.

PRODUCTION FLOW



Production stage	
1	Iron ore mining
2	Sintering
3	Blast furnace
4	Basic-oxygen furnace
5	Ladle furnace
6	Vacuum degasser
7	Continuous casting machine
8	Reheating furnace
9	Mill 2000
10	Continuous pickling line
11	Skin-pass mill
12	Cutting machines
13	Finished products in coils
14	Finished products in sheets



PACKING CHARTS

Chart No. 01

HOT-ROLLED STEEL

No.	Description
1.5	Steel baling JUMBO strap
7.2	Protective aluminized angle
19	Label (shipping)

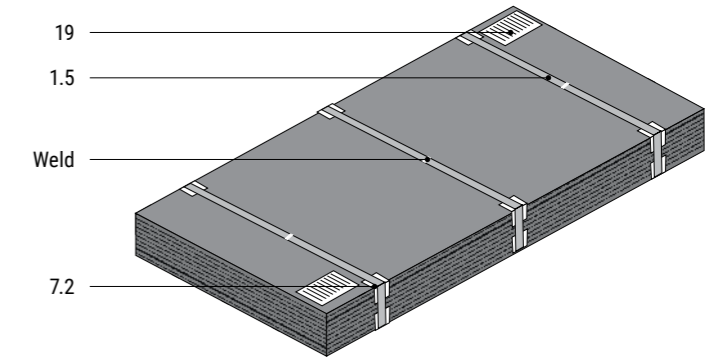


Chart No. 02

HOT-ROLLED STEEL

No.	Description
1.5	Steel baling JUMBO strap
2	Strapping seal
19	Label (shipping)

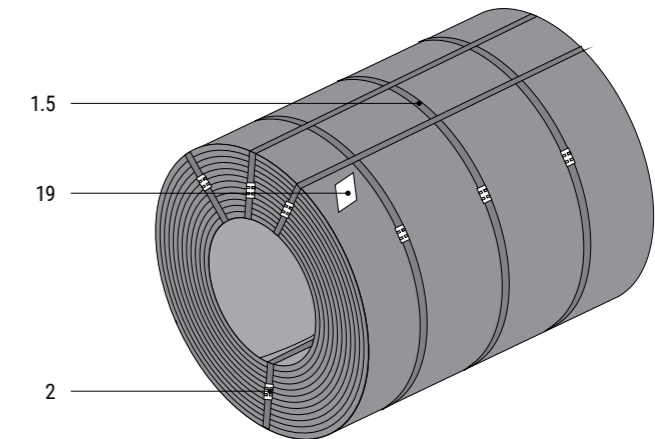


Chart No. 03

HOT-ROLLED STEEL

No.	Description
1.5	Steel baling JUMBO strap
2	Strapping seal
19	Label (shipping)

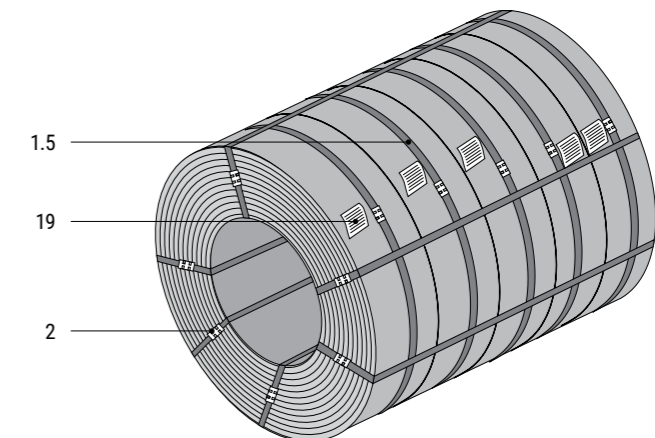


Chart No. 04

HOT-ROLLED STEEL

No.	Description
1.5	Steel baling JUMBO strap
2	Strapping seal
19	Label (shipping)

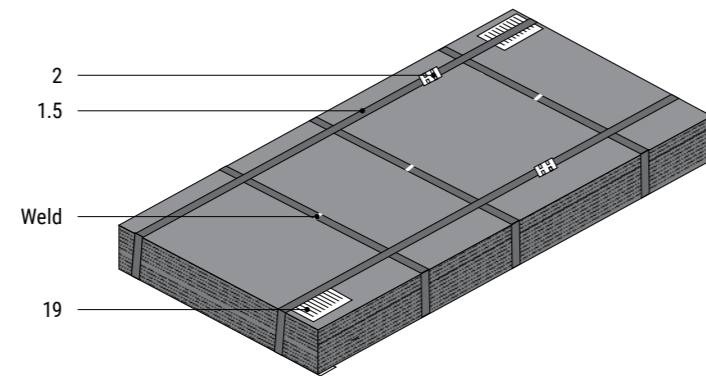
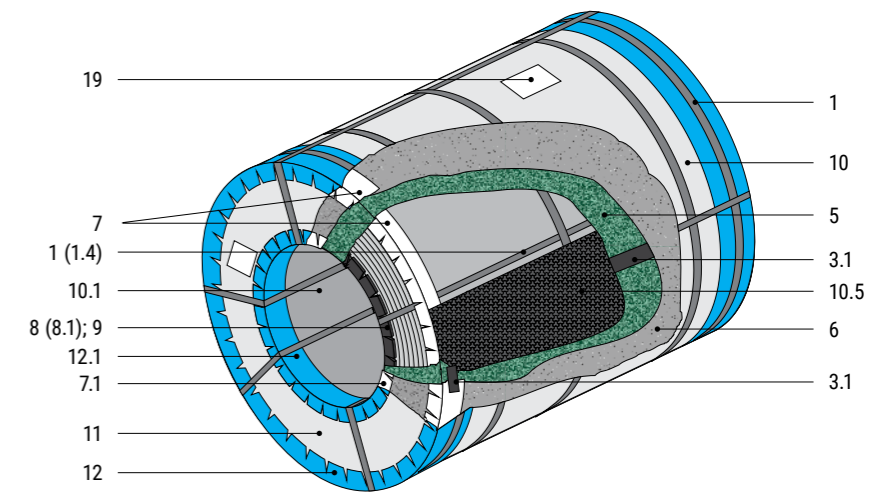


Chart No. 11, No. 11-1

HR P&O STEEL

No.	Description
1	Polyester packing strap
1.4	Steel baling strap
3	Adhesive tape 50 mm
3.1	Adhesive tape 100 mm
5	Multilayer anticorrosive material
6	Polyethylene film
7	Protective angle 60 × 60 mm
7.1*	Protective angle 120 × 80 mm
8	Plastic insert
8.1	Plastic shell
9**	Cardboard sleeve
10	External packing sheet
10.1	Internal packing sheet
10.5	Protective sheet for strap bundles
11	End cover
12	External corrugated angle
12.1	Internal corrugated angle
19	Label (shipping)



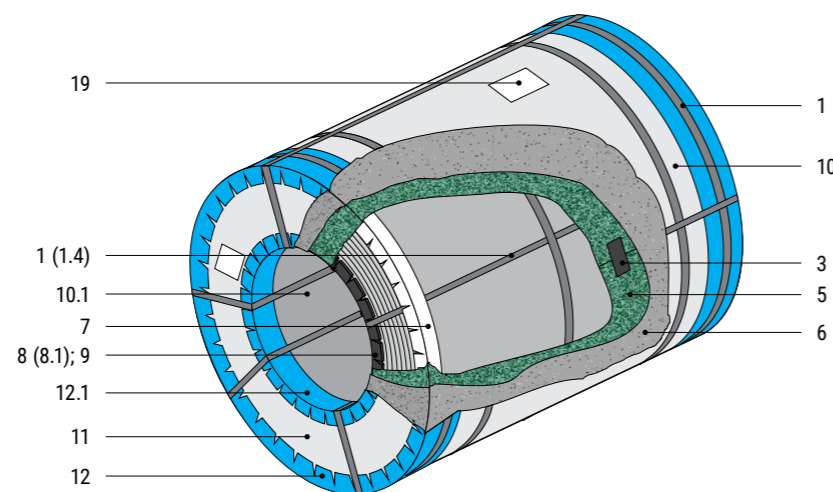
* To be installed if steel end covers are used

** For Packing Chart No. 11-1

Chart No. 10, No. 10-1

HR P&O STEEL

No.	Description
1	Polyester packing strap
1.4	Steel baling strap
3	Adhesive tape 50 mm
5	Multilayer anticorrosive material
6	Polyethylene film
7	Protective cardboard angle
8	Plastic insert
8.1	Plastic shell
9*	Cardboard sleeve
10	External packing sheet
10.1	Internal packing sheet
11	End cover
12	External corrugated angle
12.1	Internal corrugated angle
19	Label (shipping)

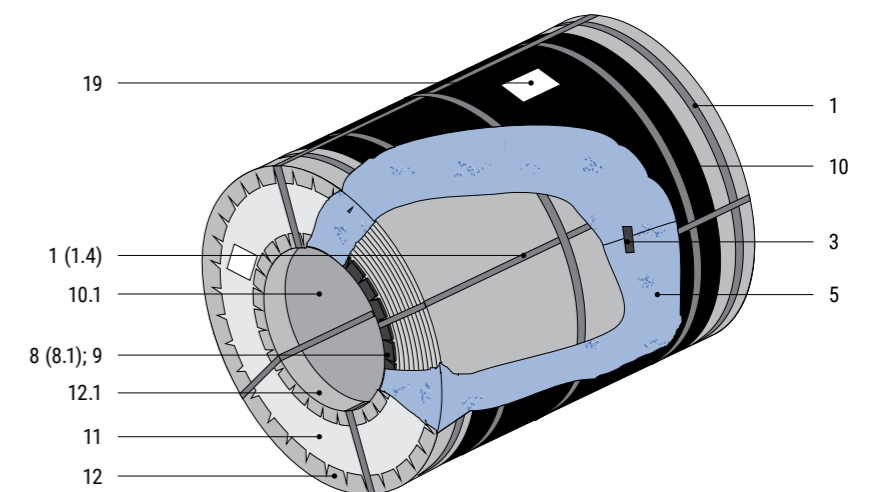


* For Packing Chart No. 10-1

Chart No. 11K, No. 11-1K

HR P&O STEEL

No.	Description
1	Polyester packing strap
1.4	Steel baling strap
3	Adhesive tape 50 mm
5	Multilayer anticorrosive material
8	Plastic insert
8.1	Plastic shell
9*	Cardboard sleeve
10	External packing sheet
10.1	Internal packing sheet
11	End cover
12	External corrugated angle
12.1	Internal corrugated angle
19	Label (shipping)



* For Packing Chart No. 11-1K

CERTIFICATION OF NLMK GROUP'S MANAGEMENT SYSTEM

Certification body	International standard	Management System
TÜV AUSTRIA CERT GMBH	ISO 9001:2015	Quality Management System
TÜV AUSTRIA CERT GMBH	ISO 14001:2015	Environmental Management System
TÜV AUSTRIA CERT GMBH	ISO 45001:2018	Occupational Health and Safety Management System
TÜV AUSTRIA CERT GMBH	ISO 50001:2018	Energy Management System



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