



TECHNICAL CATALOG OF PIPES AND TUBULAR PRODUCTS

TMK is an industrial engineering company and leading supplier of tubular solutions, structural materials, and related services. The company manufactures steel pipes, pipeline systems, and other products for the oil and gas, energy, chemical, mechanical engineering and construction industries. Its product portfolio includes pipes made of carbon, alloy and special steel.

The company comprises modern industrial complexes, including eco-efficient electric steelmaking shops, a wide range of rolling mills, and finishing capacities located across several Russian regions, along with trade offices domestically and internationally.

TMK also operates facilities for the development and production of pipeline components and equipment for the energy sector, pre-assembled units, heavy machinery products, and other complex items. With its own engineering center and steel structure manufacturing capabilities, the company delivers comprehensive turnkey infrastructure projects for its customers.

TMK includes oilfield service enterprises under the TMK NGS brand, offering pipe repair, thread cutting, inventory management, coating application, and the production of downhole equipment.

TMK is enhancing its scientific and technical expertise and developing advanced solutions with the support of its R&D centers in Moscow and Chelyabinsk. TMK’s facilities support the full cycle of creating advanced pipe solutions—from concept development to testing and production launch.

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01.

OCTG and Line pipes



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Casing is used to stabilize the wellbore during oil and gas well construction and operation

MANUFACTURERS
VTZ, STZ, SinTZ, OMZ
TAGMET, CHTPZ, PNTZ

TMK-NGS
are threaders, including
Premium thread

FEATURES
Casing is joined by thread connections with couplings or without couplings (integral joint connections).

Thread connections allow for:

- pipes to be run into wells with complex trajectories, including high dogleg severity sections
- sufficient strength under all types of loads and required sealability of pipe connections in a string
- tools and devices for operations to be run inside the string.

Operational control at each stage of casing manufacture ensures compliance with ISO 9001 and API* Spec Q1 as well as high product quality.

Casing finishing lines are equipped with advanced process and control equipment.

The following types of casing are available:

- standard
- low-temperature
- corrosion-resistant.

TMK plants have a unique casing collapse test bench with a maximum hydraulic pressure of 2,000 atmospheres. At customer’s request, the bench can be used to test pipes with diameters from 101.6 mm to 340 mm.

Casing produced by TMK plants complies with:

- API* Spec 5CT; API* Spec 5B
- GOST 632-80; GOST 31446-2017
- customer-approved technical specifications
- corporate standards.

At customer’s request, coating can be applied to the external surface of casing.

All pipes are marked with paint and die stamping in line with the applicable technical standards.

Threads of supplied casing, couplings and box and pin ends of integral joint pipes are protected with storage compound and thread protectors. Metal, polymer or composite protectors can be used at customer’s request.

Standards

Standards	Outside diameter		Pipes size		Length (m)	Grade	Thread
	Inches	mm	ppf	mm			
1	2	3	4	5	6	7	8
API* Spec 5CT Casing and Tubing	4 ½"	114.30	9.5; 10.5; 11.6; 13.5; 15.1	5.12; 5.69; 6.35; 7.37; 8.56	R1, R2, R3	J55; K55; K72; L80 type 1; N80 type 1; N80 type Q; C90; R95; T95; C110; P110; Q125; TMK140 DW; TMK150 DW	BC; SC; LC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4; TMK UP Centum;TMK UP Centum ET; TMK UP Momentum FL; TMK UP Momentum; TMK UP Momentum GT
	5"	127.00	13.0; 15.0; 18.0; 21.4; 23.2; 24.1	6.43; 7.52; 9.19; 11.10; 12.14; 12.70			BC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Simplex; TMK UP Momentum; TMK UP Momentum FL; TMK UP Momentum GT
	5 ½"	139.70	14.0; 15.5; 17.0; 20.0; 23.0	6.2; 6.98; 7.72; 9.17; 10.54; 12.09			BC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP Centum; TMK UP Centum ET; TMK UP Simplex; TMK UP Momentum; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum GT
	5 ¾"	146.05	20.0; 24.0; 28.0; 32.0	7.0; 8.05		J55; K55; K72; L80 type 1; L80 type 13Cr; N80 type 1; N80 type Q; C90; R95; T95; C110; P110; Q125; TMK140 DW; TMK150 DW	BC; SC; LC; TMK UP FMC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4
	6 5/8"	168.28	20.0; 21.25; 24.00; 28.00; 32.00	7.32; 8.0; 8.94; 10.59; 12.06			BC; SC; LC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4; TMK UP Centum; TMK UP Centum ET; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum; TMk UP Momentum GT; OTTM; OTTF
	7"	177.80	20.0; 23.0; 26.0; 29.0; 32.0; 35.0; 38.0	6.91; 8.05; 9.19; 10.36; 11.51; 12.05; 12.65; 13.72			LC; SC; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Simplex; TMK UP Momentum FL; TMK UP Momentum SFL; BC
	7 5/8"	193.68	26.4; 29.7; 33.7; 39.0; 42.8; 45.3; 47.0	8.33; 9.52; 10.54; 10.92; 12.0; 12.70; 14.27; 15.11; 15.88; 17.45; 19.05		H40; J55; K55; K72; M65; L80 type 1; L80 type 13Cr; N80 type Q; N80; C90; R95; P110; C110; T95; Q125; L80S; TMK140 DW; TMK150 DW	BC; plain-end; LC; SC; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Centum; TMK UP Simplex; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum GT; TMK UP Magna; TMK UP Magna
	8 5/8"	219.08	32.0; 36.0; 40.0; 44.0; 49.0	8.94; 10.16; 11.43; 12.70; 14.15			LC; SC; BC; plain-end; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB II; TMK UP Centum; TMK UP Momentum, TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum GT; TMK UP Magna; TMK UP GF
	9 5/8"	244.48	32.3; 36.0; 40.0; 43.5; 47.0; 53.5; 58.4	7.92; 8.94; 10.03; 11.05; 11.99; 13.84; 15.11			LC; SC; BC; plain-end; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Centum; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Momentum FL, TMK UP Momentum GT; TMK UP Magna; BC
	9 7/8"	250.83	62.8; 66.4	15.88; 16.79			plain-end
	10 ¾"	273.05	40.5; 45.5; 51.0; 55.5; 60.7; 65.7; 73.20	8.89; 10.16; 11.43; 12.57; 13.84; 15.11; 17.07			BC; LC; SC; plain-end; TMK UP PF; TMK UP PF ET
		298.45		11.05; 12.42; 13.56; 14,.78			BC
		301.63		13.97; 14.78			BC; LC; SC; plain-end; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Magna
		323.85					TMK UP Momentum FL
	13 3/8"	339.72	48.0; 54.5; 61.0; 68.0; 72.0	8.38; 9.65; 10.92; 12.19; 13.06			Plain-end; TMK UP Magna
	16"	406.40	75.0; 84.0; 109.0	14.37 11.13; 12.57; 16.66			
1	2	3	4	5	6	7	8

Standards (continued)

Standards	Outside diameter		Pipes size		Length (m)	Grade	Thread
	Inches	mm	Wall thickness				
1	2	3	4	5	6	7	8
GOST 31446-2017 Steel casing and tubing for petroleum and natural gas industries. General specifications (effective date: July 01, 2018)		114.3		6.35; 7.37; 8.56	1, 2, 3 length ranges	H40; J55; K55; L80 type 1; N80 type Q; C90; R95; T95; P110; Q125; Q135 L80S; TMK140 DW; TMK150 DW	BC; SC; LC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4; TMK UP Centum; TMK UP Centum ET; TMK UP Momentum FL; TMK UP Momentum; TMK UP Momentum GT
		127.0		6.43; 7.52; 9.19; 11.1; 12.4; 12.7			BC; OTTM, OTTG; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Simplex; TMK UP Momentum; TMK UP Momentum FL; TMK UP Momentum GT
		139.7		6.2; 6.98; 7.72; 9.17; 10.54			BC, OTTM, OTTG; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP Centum; TMK UP Centum ET; TMK UP Simplex; TMK UP Momentum; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum GT
		146.05		6.5; 7.0; 7.7; 8.5; 9.5; 10.7			BC; TMK UP FMC; SC; LC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4
		168.28		7.32; 8.0; 8.94; 10.59; 12.06			BC; SC; LC; TMK UP CS; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP 4; TMK UP Centum; TMK UP Centum ET; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum; TMK UP Momentum GT
		177.8		6.91; 8.0; 8.05; 9.19; 10.36; 11.51; 12.65; 13.72			LC; SC; OTTM; OTTG; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Simplex; TMK UP Momentum FL; TMK UP Momentum SFL; TMK UP Momentum GT
		193.68		8.33; 9.52; 10.54; 10.92; 12.0; 12.7; 14.27; 15.11; 15.88		J55, K55, N80 type Q, N80 type 1, R95, P110, TMK150 DW	OTTM; OTTG; BC; plain-end; TMK UP PF ET; TMK UP CWB; TMK UP Centum; TMK UP Simplex; TMK UP Momentum FL; TMK UP Momentum SFL
		219.08		8.94; 10.16; 11.43; 12.70		J55; K55; N80 type Q	OTTM; OTTG; BC; plain-end; TMK UP PF; TMK UP PF ET; TMK UP FMC; TMK UP Centum; TMK UP Magna
				14.15		J55; K55; L80 type 1; R95	OTTM; OTTG; BC; plain-end; TMK UP PF; TMK UP PF ET; TMK UP FMC
		244.48		7.92; 8.94; 10.03; 11.05; 11.99; 13.84; 15.11		J55, K55, N80 type Q, N80 type 1, R95, P110, TMK150 DW	LC; SC; OTTM; OTTG; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Simplex; TMK UP Momentum, TMK UP Momentum FL, TMK UP Momentum SFL; TMK UP Momentum GT; TMK UP Magna
		273.05		8.89; 10.16; 11.43; 12.57; 13.84; 15.11; 17.07			LC; SC; OTTM; OTTG; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Simplex; TMK UP Momentum FL, TMK UP Momentum GT; TMK UP Magna
		323.85		8.50		J55; K55; P110	OTTM; BC; plain-end; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP Magna
				9.50; 11.00; 12.40; 14.0		J55, K55, L80 type 1, N80 type Q, R95, P110	OTTM; OTTG; BC; plain-end; TMK UP FMC, TMK UP PF; TMK UP PF ET; TMK UP Centum; TMK UP Simplex; TMK UP CWB; TMK UP CWB II; TMK UP Magna
		339.72		9.65; 10.92; 12.19; 13.06		J55, K55, N80 type Q, N80 type 1, L80S; R95; P110; TMK140 DW; TMK150 DW	LC; SC; OTTM; OTTG; TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP CWB; TMK UP CWB II; TMK UP Centum; TMK UP Simplex; TMK UP Magna
		406.40		11.13; 12.57; 16.66			Plain-end, TMK UP Magna
		425.45		14.38			TMK UP Momentum FL
11	Plain-end; TMK UP Magna						
1	2	3	4	5	6	7	8

Mechanical properties of casing

Grades	Tensile strength		Yield strength		Elongation %, min
	Metric units, MPa, min	Imperial units, ksi	Metric units, MPa	Imperial units, ksi	
API* Spec 5 CT					
J55	517	75	379-552	55-80	*
K55	655	95	379-552	55-80	*
L80-1	655	95	552-655	80-95	*
N80; N80Q	689	110	552-758	80-110	*
R95	724	105	655-758	95-110	*
P110	862	125	758-965	110-140	*
Q125	931	135	862-1 034	125-150	*
Q125	931		862-1 034		*
GOST 632-80					
D (mod. A)	655		379-552		14.3
K	687		Min 490		12.0
Ye	689		552-758		13.0
L	758		655-862		12.3
M	862		758-965		10.8
R	1 000		930-1 137		9.5
GOST 31446-2017					
J55	517		379-552		-
K55	655		379-552		-
M65	556		448-586		-
L80-1	655		552-655		-
L80 type 13Cr	655	95	552 -65	80-955	
N80; N80Q	689		552-758		-
C90	689		621-724		-
T95	724	105	655-758	95-110	
R95	758		655-862		-
C110	793	115	758-826	110-120	
P110	862		758-965		-
Q125	931		862-1 034		-
TMK Spec					
TMK 140	1 034		965-1 103		*
TMK 150	1 103		1034-1 172		*

* Calculated as per API* Spec 5 CT.

THERMALLY INSULATED CASING (THERMOCASES)

Thermally insulated casing ("thermocases") are used as conductor pipes in permafrost areas. Thermocases prevent wellbore soil thawing and reduce the permafrost thawing radius near the wellbore to ensure wellhead stability

FEATURES

Thermally insulated casing consists of two concentric tubes separated by polyurethane foam thermal insulation, end caps and a joint kit. The inner tube protrudes from the outer tube and is equipped with flanges or couplings to joint with another pipes. The joint area is closed with a metal cover, and space between the cover and the inner tube is filled with thermal insulation. Each thermally insulated casing is factory-made (including the metal structure and the thermal insulation layer). Thermal insulation is made of eco-friendly types of pour-in-place polyurethane foams based on ozone-friendly freons as well as Russian or imported freon-free polyurethane foams.

APPLICATIONS:

Thermally insulated casing is used to ensure stability of the wellhead zone and to prevent complications resulting from near-wellhead formation sinking, including:

- prevent near-wellhead sinkholes caused by thawing of subsiding, cavernous permafrost (ice layers, vein ice, ice-rich frozen ground, highly subsiding soils) near the surface with depths of no more than 100 m during well construction and operation
- develop well clusters that need to be located in areas prone to subsidence and prevent the joining of thawed permafrost areas of adjacent wells in the upper part of cryolithosphere during the cluster well operation
- maintain effective thermal operation modes of gas and oil wells.

Today LLC «Truboplast» manufactures thermoinsulated pipes according to following specifications: TY 25.99.29-035-32256008-2025 «Thermoinsulated casing pipes for permafrost areas».

Standards

Standards	Pipes size		Connection type
	Outer tube diameter (wall thickness), mm	Inner tube diameter (wall thickness), mm	
1	2	3	4
TU 23.99.19-006-91076026-2017 Thermally insulated conductor pipes for permafrost zones	377 (10)	244.48 (8.94)	Threaded (connection type at the Customer's request)
	377 (7, 9, 10, 11)	245 (8.9)	
	426 (7, 10, 11, 12)	245 (8.9)	
	426 (7, 8, 10, 11)	339.72 (9.65)	
	473.08 (11.05)	339.72 (9.65)	
	530 (7, 7.5, 8)	324 (9.5)	
	530 (7, 8, 10)	339.72 (9.65)	
	530 (10)	426 (11)	
	630 (7, 7.5, 8, 10)	426 (10, 11)	
	630 (7, 8, 10)	426 (7, 8, 11, 12)	
	820 (10)	630 (8)	Flanged
TU 24.20.22-013-91076026-2019 Thermally insulated casing for permafrost zones	530 (8-10)	323.85 (8.5-14.0)	Threaded (connection type at Customer's request) / Flanged
	530 (8-10)	339.7 (8.4-15.4)	
	630 (8-10)	426.0 (10.0-12.0)	
	720 (8-15)	508.0 (11.1-16.1)	
	720 (8-15)	530.0 (8.0-15.0)	
1	2	3	4

TUBING

Tubing is used in oil and gas wells to transport fluids inside casing, as well as for workover and for running diagnostic or workover tools into the well

MANUFACTURERS

SinTZ, TAGMET, CHTPZ, PNTZ

TMK-NGS are threaders, including Premium thread

FEATURES

Tubing is joined by thread connections with couplings.

Thread tubing connections allow for:

- pipes to be run into wells with complex trajectories, including high dogleg severity sections
- sufficient strength under all types of loads and required sealability of pipe connections in a string
- required wear resistance and maintainability.

Operational control at each stage of tubing manufacture ensures compliance with ISO 9001 and API* Spec Q1 requirements as well as high product quality.

Tubing finishing lines are equipped with advanced process and control equipment. All tubing and couplings undergo nondestructive testing under applicable standards.

The following versions of tubing and their combinations are available:

- high-sealability
- low-temperature
- corrosion-resistant
- with external upset ends
- with polymeric sealing
- standard
- with Premium thread connections.

Tubing made by TMK complies with the following standards:

- API* Spec 5CT, API* Spec 5B
- GOST 633-80
- GOST 31446-2017
- customer-approved technical specifications.

At customer’s request, anti-corrosion coating can be applied to the external surface of tubing.

All tubing is marked with paint and die stamping in line with the applicable technical standards.

Tubing is supplied with thread compound to protect the threaded joints of tubing and couplings, and thread protectors. Metal, polymer and/or combined protective parts can be used at customer’s request.

At customer’s request, pipes can be supplied in square bundles with reinforced polyethylene frames, tied with steel band. Pipes are supplied in hexagonal bundles with a mass of two to five tonnes.

Standards

Standards	Sizes				Length, m	Grades	Connection	
	Outside diameter, inches	Outside diameter, mm	Wall thickness					
			ppf	mm				
1	2	3	4	5	6	7	8	
API* Spec 5CT Casing and tubing	2 3/8	60.32	4.0; 4.6; 5.8	4.24; 4.83; 6.45;	R1 7.0 m-7.32 m; R2 8.53 m-9.75 m (up to 10.36 m); R3 11.58 m-12.8 m (max 12.05 m)	J55; L80 type 1; L80 type 13Cr; N80 type Q; C90; P110; T95; R95	TMK UP PF; plain-end; threaded non-upset; threaded with external upset ends	
	2 7/8	73.02	6.4	5.51		J55-P110; L80 type 13Cr	TMK UP PF; plain-end; threaded non-upset; threaded with external upset ends	
			7.8	7.01		J55-P110		
			8.6	7.82		N80 type Q; C90; P110; T95		
	3 1/2	88.9	7.7	5.49		J55-P110	TMK UP PF; TMK UP Centum ET; plain-end, threaded non-upset, threaded with external upset ends	
			9.2; 10.2	6.45; 7.34		J55-P110; L80 type 13Cr		
			12.7	9.52		J55-L80; N80-P110		
			15.5	12.09		K55; R95; L80 type 1; L80 type 13Cr; N80 type Q; C90; T95		
	4	101.6	9.5; 10.7; 13.2	5.74; 6.65; 8.38		J55-L80; N80-P110	TMK UP PF, TMK UP Centum ET, plain-end, threaded non-upset, threaded with external upset ends	
	4 1/2	114.3	12.6	6.88		J55; L80 type 1; L80 type 13Cr; N80 type Q; C90; P110; T95; R95	TMK UP PF, TMK UP Centum, TMK UP Centum ET, plain-end, threaded non-upse, threaded with external upset ends	
			15.2; 18.9	8.56; 10.92				
GOST 633-80 Seamless tubing pipes and couplings for them		33.4		3.5	Version A: 9.5-10.5	D; K; Ye	NKT	
		48.3		4			NKT; NKV; NKM	
		60.3		5.0				
		73.0		5.5		D; K; Ye; L; M P		
				7.0				
		88.9		6.5				NKV; NKM
				8.0				NKT; NKV; NKM
		101.6		6.5		NKT; NKM		
		114.3		7.0				
1	2	3	4	5	6	7	8	

Standards (continued)

Standards	Pipes dimensions, pipes grades and end types										
	Outside diameter, D	Wall thickness, S	J55	K72	L80 or 1	N80		C90	T95	R95	P110
	mm	mm				type 1	type Q				
	Tubing, end types: P - plain-end, N - for NU connection, U- for EU connection, K - for NKT connection, H - for NKTV connection, C - for NKM connection, F - for TMK UP FMT connection, R - for TMK UP PF connection, M - for TMK UP CENTUM connection, T - for TMK UP CENTUM ET connection										
GOST 31446-2017 Steel casing and tubing for petroleum and natural gas industries. General specifications (Effective date: July 01, 2018)	33.40	3.38	PNK	—	—	PNK	—	—	—	—	—
	33.40	3.50	PK	PK	—	PK	—	—	—	—	—
	33.40	4.55	PK	—	—	P	—	—	—	—	—
	48.26	3.68	PNK	—	PNK	PNK	PNK	PN	PN	—	—
	48.26	4.00	PK	PK	PK	PK	PK	—	—	—	—
	60.32	4.24	PNK	—	PNK	PNK	PNK	PNK	PNK	—	—
	60.32	4.83	PNUKHCR	—	PNUKHCR	PNKCR	PNUKHCR	PNUKHCR	PNKCR	PKCR	PNUHCR
	60.32	5.00	PKHC	PKHC	PKHC	PKHC	PKHC	PKHC	PKC	PKC	PHC
	60.32	6.45	—	—	PNUKH	PNK	PNUKH	PNUKH	PNK	PK	PNUKH
	73.02	5.51	PNUKHCFR	PKHCFR	PNUKHCFR	PNKCFR	PNUKHCFR	PNUKHCFR	PNKCFR	PKCFR	PNUKHCFR
	73.02	7.01	PKHCFR	PKHCFR	PNUKHCFR	PNKCFR	PNUKHCFR	PNUKHCFR	PNKCFR	PKCFR	PNUKHCFR
	73.02	7.82	—	—	PNU	PNU	PNU	PNU	PN	—	PNU
	88.90	5.49	PNFR	FR	PNFRT	PNFRT	PNFRT	PNFRT	PNFRT	FRT	FRT
	88.90	6.45	PNUKHCFR	PKHCFR	PNUKHCFRT	PNKCFRT	PNUKHCFRT	PNUKHCFRT	PNKCFRT	PKCFRT	PNUKHCFRT
	88.90	7.34	PNUKHCFR	FR	PNUKHCFRT	PNKCFRT	PNUKHCFRT	PNUKHCFRT	PNKCFRT	PKCFRT	PKHCFRT
	88.90	8.00	PKHCFR	PHCFR	PKHCFRT	PKCFRT	PKHCFRT	PKHCFRT	PKCFRT	PKCFRT	PKHCFRT
	88.90	9.52	FR	FR	PNUKHCFRT	PNKCFRT	PNUKHCFRT	PNUKHCFRT	PNKCFRT	PKCFRT	PNUKHCFRT
	101.60	5.74	PNT	—	PNT	PNT	PNT	PNT	PNT	—	—
	101.60	6.50	PKHC	PKHC	PKHCRT	PKCRT	PKHCRT	PKHCT	PKCT	PKCRT	PKHCT
	101.60	6.65	PUKHC	—	PUKHCT	PKCT	PUKHCT	PUKHCT	PKCT	PKCT	PKHCT
	114.30	6.88	PNUKHCFR	FR	PNUKHCFRMT	PNKCFRMT	PNUKHCFRMT	PNUKHCFRMT	PNKCFRMT	PKCFRMT	PKHCFRMT
	114.30	7.00	PKHC	PKHC	PKHCMT	PKCMT	PKHCMT	PKHCMT	PKCMT	PKCMT	PKHCMT

Mechanical properties of tubing as per GOST 633-80

Property	Mechanical properties required for steel grades					
	D (modification A)	K (NKT)	Ye	L	M	P
Tensile strength σ _B , min MPa (kgf/cm²)	655(66,8)	687(70,0)	689(70,3)	758(77,3)	823(83,9)	1000(101,9)
Yield strength. σ _y : – min. MPa (kgf/cm²) – max. MPa (kgf/cm²)	379 (38.7) 552 (56.2)	491 (50.0)	552 (56.2) 758 (77.3)	654 (66.8) 862 (87.9)	724 (73.8) 921 (93.9)	930 (94.9) 1137 (116.0)
Elongation. δ ₅ . min %	14.3	12.0	13.0	12.3	11.3	9.5

Requirements for mechanical properties of tubing as per API* Spec 5CT and GOST 31446-2017

Grade	Tensile strength		Yield strength	
	Imperial units, ksi	Metric units, MPa	Imperial units, ksi	Metric units, MPa
H40	60	414	40-80	276-552
J55	75	517	55-80	379-552
K55	95	655	55-80	379-552
K72		687		min 491
N80 type 1	100	689	80-110	552-758
N80 type Q	100	689	80-110	552-758
M65		586		448-586
L80 type 1	95	655	80-95	552-655
L80 13Cr	95	655	80-95	552-655
C90		689		621-724
R95 (API)	105	724	95-110	655-758
R95 (GOST)		758		655-862
T95	105	724	95-110	655-758
C110	115	793	110-120	758-826
P110	125	862	110-140	758-965
Q125	135	931	125-150	862-1034
Q 135		1000		930-1137

VACUUM (VIT) AND NON-VACUUM INSULATED TUBING

Vacuum insulated tubing is designed for oil and gas production in permafrost areas to prevent soil thawing and, consequently, failure of the entire well infrastructure, as well as to prevent paraffin and gas hydrate plugging caused by a decrease in produced fluid temperature in the upper part of the well.

Insulated tubing is also used for thermal hydrocarbon recovery, in particular steam-assisted production of heavy (viscous) oil, to increase well flow rate

MANUFACTURERS

SinTZ

FEATURES

Insulated tubing (VIT) consists of two tubes, one (shell) inside the other (bearing tube). The tubes are joined by welding with multiple reflective layers in the sealed space between the tubes where deep vacuum is created to reduce thermal losses.

VIT strings are assembled using threaded couplings, including premium couplings, and bushings made of thermal insulation material.

TMK manufactures low-temperature insulated tubing, as well as insulated tubing made of martensitic 13CrL steels resistant to environments with high CO₂ content (TU 14-161-240-2018 and TU 14-161-243-2019). These products have been successfully field-tested and approved for commercial operation.

Applications of insulated tubing:

- oil and gas field development in the most challenging production environments in permafrost zones, with high-viscosity or waxy hydrocarbons. This type of insulated tubing is used to prevent near-wellbore permafrost thawing and well infrastructure failure, as well as wax and gas hydrate plugs in the upper part of the wellbore
- for thermal hydrocarbon recovery, in particular steam-assisted production of heavy (viscous) oil, to increase well flow rate. This method requires downhole injection of fluid at a high temperature – up to 350°C
- light Insulated Tubing, a non-vacuum version of insulated tubing, with reflective insulation between the tubes. Such products are used at oil and gas fields to transport fluids with temperatures up to 180°C.

Standards

Standards	Sizes				Grades	Connection
	OD of outside pipes (wall thickness) imperial units (inches, ppf)	Metric units (mm)	OD of inner pipes (wall thickness) imperial units (labels)	Mm (labels)		
TS 14-161-258-2020 Insulated tubing and couplings	3 1/2 (9.2)	88.9 (6.45)		48.26 (4)	J55, L80 type 1, L80 type 13Cr, N80 type Q, R95, P110	Buttress or round thread for tubing as per API* 5B or Premium thread of TMK UP range
	3 ½ (9.2)	88.9 (6.45)	2 3/8 (4.6)	60.32 (4.83)		
	4 (10.7)	101.6 (6.65)	2 7/8 (6.4)	73.02 (5.51)		
	4 ½ (12.6)	114.3 (6.88)	2 7/8 (6.4)	73.02 (5.51)		
	4 ½ (11.6)	114.3 (6.35)	2 7/8 (6.4)	73.02 (5.51)		
	4 ½ (12.6)	114.3 (6.88)	3 ½ (9.2)	88.9 (6.45)		
	4 ½ (11.6)	114.3 (6.35)	3 ½ (9.2)	88.9 (6.45)		
	5 (15)	127 (7.52)	3 ½ (9.2)	88.9 (6.45)		
	5 ½ (17)	139.7 (7.72)	3 ½ (9.2)	88.9 (6.45)		
	5 ½ (17)	139.7 (7.72)	4 (10.7)	101.6 (6.65)		
	5 ½ (17)	139.7 (7.72)	4 1/2 (12.6)	114.3 (6.88)		
	6 5/8 (24)	168.28 (8.94)	4 (10.6)	101.6 (6.65)		
	6 5/8 (24)	168.28 (8.94)	4 1/2 (12.6)	114.3 (6.88)		
	6 5/8 (24)	168.28 (8.94)	5 (15)	127 (7.52)		
	7 (26)	177.8 (9.19)	5 (15)	127 (7.52)		
	7 (23)	177.8 (8.05)	5 (15)	127 (7.52)		
	7 (26)	177.8 (9.19)	5 1/2 (17)	139.7 (7.72)		
	7 (23)	177.8 (8.05)	5 ½ (17)	139.7 (7.72)		
	8 5/8 (36)	219.08 (10.16)	6 5/8 (24)	168.28 (8.94)		
	9 5/8 (40)	244.48 (10.03)	6 5/8 (24)	168.28 (8.94)		

DRILL PIPES

Drill pipes with friction welded joints are intended for oil and gas production and exploration well construction and workover, sidetracking, drilling deviated and horizontal wells, and various operations in wells.

Pipes are available with internal, external or internal-external upsets, diameters from 50 mm to 139 mm, wall thicknesses from 5.5 mm to 12.7 mm, pipes grades from D to R in accordance with GOST R 50278 and TU or pipes grades from D to S in accordance with GOST 32696, or pipes grades from E to S in accordance with API* Spec 5DP

MANUFACTURERS

SinTZ, TAGMET

FEATURES

Drill pipes are connected by tool joints with special thread. Pipes body ends are upset externally, internally or both internally and externally before tool joints are welded.

Drill pipes are seamless, made of carbon or alloy steels by friction welding of tool joints to upset ends of the drill pipes body.

TMK drill pipes and tool joints comply with the applicable specifications.

Drill pipes are protected against atmospheric corrosion by special protective coatings, including colorless varnish.

Tool joint threads are protected by rust-preventive compound and polymeric or metallic protectors.

At customer’s request, pipes can be supplied with hard-faced boxes and/or pins of tool joints, copper-plated tool joint threads, following a break-in procedure consisting of making up / breaking out the connection three times, or cold rolling of thread roots.

At customer’s request, pipes can be supplied in square bundles with frames, tied with steel band.

Standards

Standards*	Pipes size		Length range,m	Grade	Tool joint	Upset type		
	Outside diameter, mm (inches)	Wall thickness mm (ppf)						
1	2	3	4	5	6	7		
API* Spec 5DP, second edition Drill pipes	60.33 (2 3/8)	7.11 (6.65)	Range 2 (9.14-9.75); Range 3 (12.19-12.5)	E; X; G	As per API* Spec 5DP and Tables 2 and 3 application of standards to pipe body and/or tool joints of different sizes is possible	EU		
	73.03 (2 7/8)	9.19 (10.4)		E; X; G; S		EU		
	88.90 (3 ½)	9.35 (13.3)		E; X; G		EU		
		11.40 (15.5)		E; X; G		EU		
	101.60 (4)	8.38 (14); 9.65	E; X; G; S	IU				
	114.30 (4 ½)	8.56 (16.6); 10.92 (20)	8.84-12.9	E; X; G;S		IEU		
	127.00 (5)	9.19 (19.5); 12.7 (25.6)	8.84-12.9	E; X; G; S		IEU		
	139.70 (5 ½)	9.17 (21.7); 10.54 (24.7)	8.84-12.9	E; X; G; S		IEU		
GOST 32696-2014 Steel drill pipes for petroleum and natural gas industries	60.32 (2 3/8)	7.11 (6.65)	Range 2 9.14-9.75; Range 3 12.19-12.5	D; E; X; G; S	3, NC; 5 ½ FH; TMK UP TDS; TMK EXD SG	EU		
	73.02 (2 7/8)	9.19 (10.4)					IU	
	88.90 (3 ½)	9.35 (13.3)						IU
		11.40 (15.5)						IU
	101.60 (4)	8.38 (14); 9.65	Range 2 8.84-9.75; Range 3 12.19-12.50			IU		
	114.3 (4½)	8.56 (16.6)				IEU		
		10.92 (20)						
	127 (5)	9.19 (19.5)						
		12.70 (25.6)						
	139.7 (5 ½)	9.17 (21.7)						
	10.54 (24.7)							
GOST R 50278-92 Drill pipes with weld-on tool joints	60.3	7.1	8.0-8.6; 9.0-9.45; 11.9-12.5	D; Ye; L; M	As per GOST R 50278-92	EU		
	73.0	9.2		D; Ye; L; M; R				
	88.9	9.4*; 11.4		D; Ye; L; M			IU	
	101.6	8.4						
	114.3	8.6; 10.9						
	127.0	9.2; 12.7	IEU					
	88.9	9.4; 11.4				8.0-8.6; 9.0-9.45; 11.9-12.5		
	101.6	8.4	8.0-8.6; 9.0-9.45; 11.9-12.5			3-105-57		
	114.3	8.6; 10.9						
	127.0	9.2; 12.7				TMK UP TDS TMK UP TDSA TMK UP TDSM TMK UP TDSAM	IU;EU; IEU	
139.7	9.2; 10.5							
TU 14-157-107-2009 TMK UP TDS drill pipes with weld-on tool joints	88.9	9.35	8.0-8.6 11.9-12.5	E; X; G; S; D; Ye; L; M; R				
	101.6	8.4						
	114.3	8.6; 10.9		Д; E	ЭП-121М-73			
	127.0	9.19; 12.7						
	139.7	9.2; 10.5						
	6.5							
1	2	3	4	5	6	7		

* - application of standards to pipe body and/or tool joints of different sizes is possible

Table 1 – Size classes, main dimensions and weights of TMK UP TDS tool joints

Joint type	Thread type	Tool joint OD, D2, mm	Tool joint ID, D1, mm	Tool joint length, L1, mm	Tool joint weight, kg
1	2	3	4	5	6
TMK TDS-86-44	3-73	85.7	44.5	511	14.4
TMK TDSA-86-44	NC-26	85.70	44.45	511	14.4
TMK TDSM-86-44	3-73	85.7	44.5	696	20.5
TMK TDSAM-86-44	NC-26	85.70	44.45	696	20.5
TMK TDS-92-34	3-73	92.0	34.0	511	21.0
TMK TDSM-92-34	3-73	92.0	34.0	696	30.2
TMK TDS-95-32	3-73	95.2	31.8	511	22.8
TMK TDSM-95-32	3-73	95.2	31.8	696	32.0
TMK TDS-105-54	3-86	104.8	54.0	536	23.4
TMK TDSA-105-54	NC-31	104.80	53.98	536	23.4
TMK TDSM-105-54	3-86	104.8	54.0	721	33.9
TMK TDSAM-105-54	NC-31	104.80	53.98	721	33.9
TMK TDS-105-51	3-86	104.8	50.8	536	24.3
TMK TDSA-105-51	NC-31	104.80	50.80	536	24.3
TMK TDSM-105-51	3-86	104.8	50.8	721	33.9
TMK TDSAM-105-51	NC-31	104.80	50.80	721	33.9
TMK TDS-108-44	3-86	108.0	44.5	536	29.6
TMK TDSM-108-44	3-86	108.0	44.5	721	40.7
TMK TDS-108-41	3-86	108.0	41.3	536	30.4
TMK TDSM-108-41	3-86	108.0	41.3	721	41.7
TMK TDS-127-65	3-102	127.0	65.1	600	39.1
TMK TDSA-127-65	NC-38	127.00	65.09	600	39.1
TMK TDSM-127-65	3-102	127.0	65.1	785	52.6
TMK TDSAM-127-65	NC-38	127.00	65.09	785	52.6
TMK TDS-127-62	3-102	127.0	61.9	600	40.6
TMK TDSA-127-62	NC-38	127.00	61.91	600	40.6
TMK TDSM-127-62	3-102	127.0	61.9	785	54.7
TMK TDSAM-127-62	NC-38	127.00	61.91	785	54.7
TMK TDS-127-54	3-102	127.0	54.0	600	43.8
TMK TDSA-127-54	NC-38	127.00	53.98	600	43.8
TMK TDSM-127-54	3-102	127.0	54.0	785	58.9
TMK TDSAM-127-54	NC-38	127.00	53.98	785	58.9
TMK TDS-133-68	3-108	133.4	68.3	577	41.9
TMK TDSA-133-68	NC-40	133.40	68.26	577	41.9
TMK TDSM-133-68	3-108	133.4	68.3	762	56.3
TMK TDSAM-133-68	NC-40	133.40	68.26	762	56.3
TMK TDS-140-62	3-108	139.7	61.9	577	48.8
TMK TDSA-140-62	NC-40	139.70	61.91	577	48.8
TMK TDSM-140-62	3-108	139.7	61.9	762	66.7
TMK TDSAM-140-62	NC-40	139.70	61.91	762	66.7
TMK TDS-152-83	3-122	152.4	82.6	577	53.5
TMK TDSA-152-83	NC-46	152.40	82.55	577	53.5
TMK TDSM-152-83	3-122	152.4	82.6	762	72.2
TMK TDSAM-152-83	NC-46	152.40	82.55	762	72.2
TMK TDS-152-76	3-122	152.4	76.2	577	57.0
TMK TDSA-152-76	NC-46	152.40	76.20	577	57.0
TMK TDSM-152-76	3-122	152.4	76.2	762	76.8
TMK TDSAM-152-76	NC-46	152.40	76.20	762	76.8
TMK TDS-159-83	3-122	158.8	82.6	577	60.0
1	2	3	4	5	6

Table 1 – Size classes, main dimensions and weights of TMK UP TDS tool joints (continued)

Joint type	Thread type	Tool joint OD, D2, mm	Tool joint ID, D1, mm	Tool joint length, L1, mm	Tool joint weight, kg
1	2	3	4	5	6
TMK TDSA-159-83	NC-46	158.75	82.55	577	60.0
TMK TDSM-159-83	3-122	158.8	82.6	762	80.9
TMK TDSAM-159-83	NC-46	158.75	82.55	762	80.9
TMK TDS-159-76	3-122	158.8	76.2	577	63.5
TMK TDSA-159-76	NC-46	158.75	76.20	577	63.5
TMK TDSM-159-76	3-122	158.8	76.2	762	85.7
TMK TDSAM-159-76	NC-46	158.75	76.2	762	85.7
TMK TDS-159-70	3-122	158.8	69.9	577	66.6
TMK TDSA-159-70	NC-46	158.75	69.85	577	66.6
TMK TDSM-159-70	3-122	158.8	69.9	762	89.8
TMK TDSAM-159-70	NC-46	158.75	69.85	762	89.8
TMK TDS-162-95-1	30-133	161.9	95.3	577	52.6
TMK TDSA-168-95-1	NC-50	168.28	95.25	577	58.3
TMK TDSM-162-95-1	30-133	161.9	95.3	762	72.2
TMK TDSAM-168-95-1	NC-50	168.28	95.25	762	80.3
TMK TDS-162-95-2	30-133	161.9	95.3	577	53.3
TMK TDSA-168-95-2	NC-50	168.28	95.25	577	59.0
TMK TDSM-162-95-2	30-133	161.9	95.3	762	72.9
TMK TDSAM-168-95-2	NC-50	168.28	95.25	762	81.0
TMK TDS-162-92	30-133	161.9	92.1	577	54.7
TMK TDSA-168-92	NC-50	168.28	92.08	577	60.4
TMK TDSM-162-92	30-133	161.9	92.1	762	74.9
TMK TDSAM-168-92	NC-50	168.28	92.08	762	83.0
TMK TDS-162-89-1	30-133	161.9	88.9	577	56.6
TMK TDSA-168-89-1	NC-50	168.28	88.9	577	62.3
TMK TDSM-162-89-1	30-133	161.9	88.9	762	77.5
TMK TDSAM-168-89-1	NC-50	168.28	88.9	762	85.6
TMK TDS-162-89-2	30-133	161.9	88.9	577	57.2
TMK TDSA-168-89-2	NC-50	168.28	88.9	577	62.9
TMK TDSM-162-89-2	30-133	161.9	88.9	762	78.1
TMK TDSAM-168-89-2	NC-50	168.28	88.9	762	86.2
TMK TDS-165-83	30-133	165.1	82.6	577	63.8
TMK TDSA-168-83	NC-50	168.28	82.55	577	66.7
TMK TDSM-165-83	30-133	165.1	82.6	762	87.1
TMK TDSAM-168-83	NC-50	168.28	82.55	762	91.2
TMK TDS-165-76	30-133	165.1	76.2	577	67.2
TMK TDSA-168-76-2	NC-50	168.28	76.2	577	70.0
TMK TDSM-165-76	30-133	165.1	76.2	762	91.6
TMK TDSAM-168-76-2	NC-50	168.28	76.2	762	95.7
TMK TDS-168-76	30-133	168.3	76.2	577	69.6
TMK TDSA-168-76-1	NC-50	168.28	76.2	577	69.6
TMK TDSM-168-76	30-133	168.3	76.2	762	95.3
TMK TDSAM-168-76-1	NC-50	168.28	76.2	762	95.3
TMK TDS-178-102	3-147	177.8	101.6	607	70.2
TMK TDSA-178-102	5 1/2FH	177.80	101.6	607	70.2
TMK TDSM-178-102	3-147	177.8	101.6	750	88.8
TMK TDSAM-178-102	5 1/2FH	177.80	101.6	750	88.8
TMK TDS-178-95	3-147	177.8	95.3	607	74.5
TMK TDSA-178-95-1	5 1/2FH	177.80	95.25	607	72.7
TMK TDSA-178-95-2	5 1/2FH	177.80	95.25	607	74.5
TMK TDSM-178-95	3-147	177.8	95.3	750	94.0
TMK TDSAM-178-95-1	5 1/2FH	177.80	95.25	750	92.2
TMK TDSAM-178-95-2	5 1/2FH	177.80	95.25	750	94.0
TMK TDS-184-89	3-147	184.2	88.9	607	85.6
TMK TDSA-184-89-1	5 1/2FH	184.15	88.9	607	84.5
TMK TDSA-184-89-2	5 1/2FH	184.15	88.9	607	85.6
TMK TDSM-184-89	3-147	184.2	88.9	750	108.2
TMK TDSAM-184-89-1	5 1/2FH	184.15	88.9	750	108.2
TMK TDSAM-184-89-2	5 1/2FH	184.15	88.9	750	108.2
1	2	3	4	5	6

Drill pipes and tool joint grade correspondence between GOST 32696, ISO 11961, GOST R 50278 AND GOST 27834

GOST 32696				ISO 11961:2018				GOST R 50278 (for drill pipes bodies) GOST 27834 (for tool joints)			
Drill pipes body grade	Yield strength, σ_y		Tensile strength σ_u , min	Drill pipes body grade	Yield strength, σ_y		Tensile strength σ_u , min	Drill pipes body grade	Yield strength, σ_y		Tensile strength σ_u , min
	min	max			min	max			min	max	
D	379	–	655	–	–	–	–	D	379	–	655
E	517	724	689	E	517	724	689	E	517	724	689
X	655	862	724	X	655	862	724	L	655	862	724
G	724	931	793	G	724	931	793	M	724	930	792
S	931	1138	1000	S	931	1138	1000	P	930	1138	999
Tool joints	827	1138	965	Tool joints	827	1138	965	Tool joints	832	–	981

Mechanical properties of API* Spec 5DP drill pipes

Grades	Ultimate tensile strength σ_u , MPa (ksi), min	Yield strength, σ_y , MPa, ksi		Elongation δ_5 , %, min
		min	max	
E	689 (100)	517 (75)	724 (105)	*
X	724 (105)	655 (95)	862 (125)	*
G	793 (115)	724 (105)	931 (135)	*
S	1000 (145)	931 (135)	1138 (165)	*

* Calculated by the formula given in API* Spec 5 DP

Mechanical properties of tool joints as per GOST 27834-95

Steel grade	Ultimate tensile strength σ_u , N/mm ² (kgf/mm ²), min	Yield strength σ_y , N/mm ² (kgf/mm ²), min	Elongation δ_5 , %, min	Percentage reduction of area, ϕ , %, min	Brinell hardness, HB	Impact strength, J/cm ² (kgf*m/cm ²), min	
						KCV	KCU
40HMFA 35HGMA	981 (100)	832 (85)	13	50	300-355	58.9 (6)	88.3 (9)

Table 2 – Size classes. Main dimensions and weights of TMK UP EXD SG tool joints

Joint type	Thread type	Tool joint OD, D2, mm	Tool joint ID, D1, mm	Tool joint length, L1, mm	Tong space length of pin, mm ¹⁾	Tong space length of box, mm ¹⁾	Tool joint weight, kg
1	2	3	4	5	6	7	8
TMK UP EXD SG-80-38	EXD SG 24	79.6	38.1	696	251	318	20.8
TMK UP EXD SG-102-54	EXD SG 31	101.6	54.0	696	251	318	30.1
TMK UP EXD SG-102-51	EXD SG 31	101.6	50.8	696	251	318	31.6
TMK UP EXD SG-105-54	EXD SG 31	104.8	54.0	696	251	318	32.6
TMK UP EXD SG-105-51	EXD SG 31	104.8	50.8	696	251	318	34.1
TMK UP EXD SG-108-51	EXD SG 31	108.0	50.8	696	251	318	36.7
TMK UP EXD SG-111-51	EXD SG 31	111.1	50.8	696	251	318	39.3
TMK UP EXD SG-127-73	EXD SG 39	127.0	73.0	693	248	318	43.4
TMK UP EXD SG-127-71	EXD SG 39	127.0	71.4	693	248	318	44.4
TMK UP EXD SG-127-68	EXD SG 39	127.0	68.3	693	248	318	46.3
TMK UP EXD SG-127-65	EXD SG 39	127.0	65.1	693	248	318	48.2
TMK UP EXD SG-133-76	EXD SG 40	133.4	76.2	677	227	308	47.6
TMK UP EXD SG-133-71	EXD SG 40	133.4	71.4	677	227	308	50.6
TMK UP EXD SG-133-68	EXD SG 40	133.4	68.3	677	227	308	52.4
TMK UP EXD SG-133-65	EXD SG 40	133.4	65.1	677	227	308	54.2
TMK UP EXD SG-140-68	EXD SG 40	139.7	68.3	677	227	308	58.9
TMK UP EXD SG-140-65	EXD SG 40	139.7	65.1	677	227	308	60.7
TMK UP EXD SG-162-95	EXD SG 50	161.9	95.3	677	227	308	65.8
TMK UP EXD SG-162-92	EXD SG 50	161.9	92.1	677	227	308	69.0
TMK UP EXD SG-162-89	EXD SG 50	161.9	88.9	677	227	308	71.4
TMK UP EXD SG-165-95	EXD SG 50	165.1	95.3	677	227	308	70.3
TMK UP EXD SG-165-92	EXD SG 50	165.1	92.1	677	227	308	72.8
TMK UP EXD SG-165-89	EXD SG 50	165.1	88.9	677	227	308	75.2
TMK UP EXD SG-168-95	EXD SG 50	168.3	95.3	677	227	308	74.2
TMK UP EXD SG-168-92	EXD SG 50	168.3	92.1	677	227	308	76.7
TMK UP EXD SG-168-89	EXD SG 50	168.3	88.9	677	227	308	79.1
TMK UP EXD SG-178-108	EXD SG 57	177.8	108.0	710	246	322	82.1
TMK UP EXD SG-178-102	EXD SG 57	177.8	101.6	710	246	322	88.0
TMK UP EXD SG-178-95	EXD SG 57	177.8	95.3	710	246	322	93.5
1	2	3	4	5	6	7	8

1) Joints with other tong space lengths can be supplied at the customer’s request.

OIL AND GAS PIPES MADE OF SPECIAL STEELS AND ALLOYS

TMK Group has developed a wide range of oil and gas linepipes, tubing and casing with special properties for extremely low-temperature and corrosive environments

MANUFACTURERS

VTZ, SinTZ, TAGMET, CHTPZ, PNTZ, STZ

FEATURES

Low-temperature tubing and casing pipes

Pipes designed for Siberian and Far North. The pipe metal has high ductility and impact strength at negative temperatures. Charpy impact test at -60°C with determination of ductile fracture percentage in the test piece is used to evaluate low-temperature performance of pipes metal.

Hydrogen sulfide-resistant pipes (S, SS)

Pipes intended for fields with hydrogen sulfide in produced fluids. The pipe metal has high sulfide stress cracking resistance, which is confirmed by tests in accordance with NACE TM0177. The threshold stress intensity factor for pipes during metal testing is selected depending on applicable pipe standards and H₂S partial pressure. S or SS is added to pipes grade designations of hydrogen sulfide resistant pipes in case of supply as per TU.

Carbon dioxide resistant tubing and casing pipes (13CR, 13CRL)

Pipes intended for fields with carbon dioxide in produced fluids and for CCUS projects. Pipe metal is resistant to local and general CO₂ corrosion. Pipe steel contains 12.0-14.0% of chromium to ensure corrosion resistance. CO₂ resistant pipes can be supplied for standard and low-temperature application.

Carbon dioxide resistant oil and gas line pipes (13CR)

Pipes intended for the construction of pipelines in fields containing carbon dioxide in produced and transported fluids. The metal of the pipes is resistant to local and general carbon dioxide corrosion. To ensure corrosion resistance of pipes, the chromium content in steel is 12.0-14.0%. The pipes are manufactured with steel grade X80 (80 psi). When supplied, oil and gas carbon dioxide resistant line pipes can be equipped with the connecting parts of the same steel grade.

Standards for OCTG made of special steel grades and alloys

Standards	Pipes size			Length, m	Grade	Connection
	Outside diameter		Wall thickness, mm (ppf)			
	inches	mm				
1	2	3	4	5	6	7
API* Specification 5CRA / ISO 13680 Specification for Corrosion-resistant Alloy Seamless Tubes for Use as Casing, Tubing, and Coupling Stock	3 1/2	88.9	6.45 (9.2)	8.0-12.0	UNS N08028 (110 ksi); UNS N08535 (110 ksi)	TMK UP PF
	4 1/2	114.3	6.88 (12.6)			
	4 1/2	114.3	7.37 (13.5)			
	5	127	7.52 (15)			
	6 5/8	168.28	10.59 (28)			
	7	177.8	9.19 (26)			
	7	177.8	10.36 (29)			
GOST 31446-2017 Steel casing and tubing for petroleum and natural gas industries. General specifications (Effective date: July 01, 2018)	73	73.02	5.51	8.0-12.0	L80 type 1; L80 type 13Cr; C90; T95; C110	Plain-end; NKT; NKTv; NKM; TMK FMT; TMK UP PF
		73.02	7.01			PLAIN-END; NKT; NKTv; NKM; TMK FMT; TMK UP PF; TMK UP CENTUM ET
	89	88.90	6.45			TMK UP FMC; TMK UP PF; TMK UP PF ET; TMK UP Centum; TMK UP Centum ET
		88.90	7.34			
114-273	114.3-273.1	7.37-13.06				
TU 14-157-119-2015		114.3	6.88	7.62-10.36	L80 type 1; C90 type 1	TMK UP PF
Hydrogen resistant, hydrogen sulfide resistant and low-temperature seamless steel tubing and couplings		139.7	7.72	7.62-10.36		
TU 14-3R-129-2015 Seamless casing and couplings made of martensitic 13Cr and super 13Cr steels with gas-tight threaded joints		114.3	6.35; 8.56	9.5-13.0	L80 type 13Cr; L80 type 13CrL; R95 type 13Cr; R95 type 13CrL; P110 type 13CrL; P110; P110 type 13Cr	TMK UP FMC; TMK UP PF
		168.3	8.94			
		177.8	9.19; 10.36			
		244.5	11.05; 11.99			
		273.1	11.43			
TU 14-3R-138-2014		73.02	5.51	9.5-12.2	C90SS	TMK UP PF
Hydrogen sulfide resistant seamless steel tubing and couplings of pipes grade C90SS		88.9	9.52			
		114.3	10.92			
TU 14-3R-139-2014 Seamless tubing and couplings made of a corrosion-resistant alloy with TMK UP PF gas-tight threaded connections		88.9	6.45	8.0-12.0	110CrNi	TMK UP PF
		114.3	6.88			
TU 14-3R-168-2019 Seamless casing and couplings made of a corrosion-resistant alloy with gas-tight threaded connections		168.28	10.59	8.0-12.0	110CrNi	TMK UP PF
TS 157-240-2016 Seamless tubing and couplings made of the TMK-C corrosion-resistant alloy of pipes grade 110 with TMK UP PF gas-tight threaded connections		114.3	7.37	8.0-12.0	TMK-C	TMK UP PF
		127	7.52			
		177.8	9.19			
		177.8	10.36			
TS 62T-70-22 Seamless casing pipes and couplings made of corrosion-resistant alloy with TMK UP PF gas-tight threaded connections		114.3-177.8	7.37-10.36	8.0-12.0		TMK UP PF
1	2	3	4	5	6	7

OIL AND GAS LINE PIPES
(SEAMLESS)

Pipes for oil and gas pipelines, including sweet and sour service, for gas-lift systems, reservoir pressure maintenance systems, and field development, including pipes for low temperature application

MANUFACTURERS

VTZ, STZ, SinTZ, STZ
TAGMET, CHTPZ, PNTZ

FEATURES

Oil and gas line pipes are made of TMK’s own metal melted using EAF process, treated in ladle furnace and vacuum degassing station and cast in a continuous casting machine. This method produces pure steel complying with requirements for harmful impurities (sulfur, phosphorus and non-ferrous metals) and non-metalic inclusions ensuring high strength, ductility, viscous properties, and corrosion performance of pipes at high pressures, low temperatures, and in corrosive environments.

During manufacturing process, wall thickness is inspected by full length using ultrasonic automatic gauge, with automated nondestructive electromagnetic or ultrasonic testing for inner and outer surface defects.

At customer’s request, oil and gas line pipes can be produced for subsequent internal and/or external coating.

Tensile, flattening, hydrostatic and impact testing is conducted (if necessary) in accordance with the applicable standards.

At customer’s request, the outer surface of the pipe is coated with paint designed for protection against atmospheric corrosion during transportation and storage.

Pipes are supplied in the bundles with lifting slings.

At customer’s request, pipes can be equipped with protective end caps.

Upon delivery, oil and gas line pipe can be equipped with the necessary connecting parts and valves of the same steel grade for pipeline installation and equipment connection.

Standards

Standards	Pipes dimensions		Steel grade	Pipes grade
	Outside diameter, mm	Wall thickness, mm		
1	2	3	4	5
API* Spec 5L Specification for line pipes	33.4-406.4	3.4-28.6	L175; L175P; L210–L555	A25; A25P; A; B; X42–X80
	168.3-426	7.0-34.8		
CSA Z 245.1-07 Steel pipes	21.3-168.3	2.77-10.97	20; 12GB; 20F; 14G1F; 14G2F; 08HMFChA	Gr.241; Gr.290; Gr.359; Gr. 386; Gr. 414; Gr. 448. Categories I; II and III for ordinary and corrosive environments
Offshore standard DNV-OS-F101. Submarine pipeline systems	219-426	7.0-32.0		250–450 F; D; S; P; U
GOST 30564-98 Seamless hot-worked carbon and alloy steel pipes and tubes with special properties	38.0-426	3.5-32	10; 20; 09G2S and other steel grades; 10G2A; 15HM; 30HMA	
1	2	3	4	5

Pipes as per API* Spec 5L

Nominal size	Outside diameter		Wall thickness		Weight per unit length		Schedule
	mm	inch	mm	inch	kg/m	lb/ft	
1	2	3	4	5	6	7	8
1	33.4	1.315	3.4	0.133	2.50	1.68	STD
1	33.4	1.315	4.5	0.179	3.24	2.17	XS
1 1/4	42.2	1.660	3.6	0.140	3.39	2.27	STD
1 1/4	42.2	1.660	4.9	0.191	4.47	3.00	XS
1 1/2	48.3	1.900	3.7	0.145	4.05	2.72	STD
1 1/2	48.3	1.900	5.1	0.200	5.40	3.63	XS
2 3/8	60.3	2.375	2.1	0.083	3.02	2.03	STD
2 3/8	60.3	2.375	2.8	0.109	3.93	2.64	STD
2 3/8	60.3	2.375	3.2	0.125	4.47	3.00	STD
2 3/8	60.3	2.375	3.6	0.141	5.00	3.36	STD
2 3/8	60.3	2.375	3.9	0.154	5.43	3.65	STD
2 3/8	60.3	2.375	4.4	0.172	6.03	4.05	STD
2 3/8	60.3	2.375	4.8	0.188	6.54	4.39	STD
2 3/8	60.3	2.375	5.5	0.218	7.48	5.02	STD
2 3/8	60.3	2.375	6.4	0.250	8.45	5.76	STD
2 3/8	60.3	2.375	7.1	0.281	9.36	6.28	STD
2 7/8	73.0	2.875	3.6	0.141	6.13	4.12	STD
2 7/8	73.0	2.875	4.0	0.156	6.75	4.53	STD
2 7/8	73.0	2.875	4.4	0.172	7.40	4.97	STD
2 7/8	73.0	2.875	4.8	0.188	8.04	5.4	STD
2 7/8	73.0	2.875	5.2	0.203	8.62	5.79	STD
2 7/8	73.0	2.875	5.5	0.216	9.13	6.13	STD
2 7/8	73.0	2.875	6.4	0.250	10.44	7.01	STD
2 7/8	73.0	2.875	7.0	0.276	11.41	7.66	STD
3 1/2	88.9	3.500	4.0	0.156	8.29	5.57	STD
3 1/2	88.9	3.500	4.4	0.172	9.10	6.11	STD
3 1/2	88.9	3.500	4.8	0.188	9.90	6.65	STD
3 1/2	88.9	3.500	5.5	0.216	11.29	7.58	STD
3 1/2	88.9	3.500	6.4	0.250	12.93	8.68	STD
3 1/2	88.9	3.500	7.1	0.281	14.38	9.66	STD
3 1/2	88.9	3.500	7.6	0.300	15.26	10.25	STD
4	101.6	4.000	5.7	0.226	13.57	9.11	STD
4	101.6	4.000	6.4	0.250	14.91	10.01	STD
4	101.6	4.000	7.1	0.281	16.62	11.16	STD
4	101.6	4.000	8.1	0.318	18.61	12.50	STD
4 1/2	114.3	4.500	5.2	0.203	13.88	9.32	STD
4 1/2	114.3	4.500	5.6	0.219	14.91	10.01	STD
4 1/2	114.3	4.500	6.0	0.237	16.07	10.79	STD
4 1/2	114.3	4.500	6.4	0.250	16.90	11.35	STD
4 1/2	114.3	4.500	7.1	0.281	18.85	12.66	STD
4 1/2	114.3	4.500	7.9	0.312	20.79	13.96	STD
4 1/2	114.3	4.500	8.6	0.337	22.31	14.98	STD
4 1/2	114.3	4.500	11.1	0.438	28.30	19.00	STD
5 9/16	141.3	5.563	5.6	0.219	18.61	12.50	STD
5 9/16	141.3	5.563	6.6	0.258	21.77	14.62	STD
5 9/16	141.3	5.563	7.1	0.281	23.61	15.85	STD
5 9/16	141.3	5.563	7.9	0.312	26.06	17.50	STD
5 9/16	141.3	5.563	8.7	0.344	28.55	19.17	STD
5 9/16	141.3	5.563	9.5	0.375	30.95	20.78	STD
5 9/16	141.3	5.563	12.7	0.500	40.28	27.04	STD
6 5/8	168.3	6.625	6.4	0.250	25.35	17.02	-
6 5/8	168.3	6.625	7.1	0.280	28.22	18.97	STD
6 5/8	168.3	6.625	7.9	0.312	31.25	21.04	
6 5/8	168.3	6.625	8.7	0.344	34.24	23.08	
6 5/8	168.3	6.625	9.5	0.375	37.20	25.03	
6 5/8	168.3	6.625	11.0	0.432	42.67	28.57	XS
6 5/8	168.3	6.625	12.7	0.500	48.73	32.71	
6 5/8	168.3	6.625	14.3	0.562	54.31	36.39	
6 5/8	168.3	6.625	15.9	0.625	59.76	40.05	
6 5/8	168.3	6.625	18.3	0.750	67.69	45.35	
6 5/8	168.3	6.625	19.1	0.864	70.27	47.06	XXS
6 5/8	168.3	6.625	22.2	0.875	79.98	53.73	
8 5/8	219.1	8.625	7.0	0.277	36.61	24.70	
8 5/8	219.1	8.625	7.9	0.312	41.14	27.70	
8 5/8	219.1	8.625	8.18	0.322	42.55	28.58	STD
8 5/8	219.1	8.625	8.74	0.344	45.34	30.45	
8 5/8	219.1	8.625	9.53	0.375	49.25	33.07	
8 5/8	219.1	8.625	11.13	0.438	57.08	38.33	
8 5/8	219.1	8.625	12.70	0.500	64.64	43.43	XS
8 5/8	219.1	8.625	14.27	0.562	72.08	48.44	
8 5/8	219.1	8.625	15.88	0.625	79.59	53.45	
8 5/8	219.1	8.625	18.26	0.719	90.44	60.77	
8 5/8	219.1	8.625	19.05	0.750	93.98	63.14	
8 5/8	219.1	8.625	20.62	0.812	100.93	67.82	
8 5/8	219.1	8.625	22.23	0.875	107.93	72.49	XXS
1	2	3	4	5	6	7	8

Pipes as per API* Spec 5L (continued)

Nominal size	Outside diameter		Wall thickness		Weight per unit length		Schedule
	mm	inch	mm	inch	kg/m	lb/ft	
1	2	3	4	5	6	7	8
8 5/8	219.1	8.625	25.40	1.000	121.33	81.51	
10 3/4	273.0	10.750	7.80	0.307	51.01	34.27	
10 3/4	273.0	10.750	8.74	0.344	56.96	38.27	
10 3/4	273.0	10.750	9.27	0.365	60.29	40.52	STD
10 3/4	273.0	10.750	11.13	0.438	71.88	48.28	
10 3/4	273.0	10.750	12.70	0.500	81.53	54.79	XS
10 3/4	273.0	10.750	14.27	0.562	91.05	61.21	
10 3/4	273.0	10.750	15.88	0.625	100.69	67.65	
10 3/4	273.0	10.750	18.26	0.719	114.71	77.10	
10 3/4	273.0	10.750	20.62	0.812	128.34	86.26	
10 3/4	273.0	10.750	22.23	0.875	137.48	92.37	
10 3/4	273.0	10.750	23.83	0.938	146.43	98.39	
10 3/4	273.0	10.750	25.40	1.000	155.10	104.23	XXS
12 3/4	323.8	12.750	8.74	0.344	67.31	45.62	
12 3/4	323.8	12.750	9.53	0.375	73.86	49.61	STD
12 3/4	323.8	12.750	10.31	0.406	79.71	53.57	
12 3/4	323.8	12.750	11.13	0.438	85.82	57.65	
12 3/4	323.8	12.750	12.70	0.500	97.44	65.48	XS
12 3/4	323.8	12.750	14.27	0.562	108.93	73.22	
12 3/4	323.8	12.750	15.88	0.625	120.53	81.01	
12 3/4	323.8	12.750	17.48	0.688	132.05	88.71	
12 3/4	323.8	12.750	19.05	0.750	143.17	96.21	
12 3/4	323.8	12.750	20.62	0.812	154.17	103.63	
12 3/4	323.8	12.750	22.23	0.875	165.33	111.08	
12 3/4	323.8	12.750	23.83	0.938	176.29	118.44	
12 3/4	323.8	12.750	25.40	1.000	186.92	125.61	XXS
12 3/4	323.8	12.750	26.97	1.062	197.43	132.69	
14	355.6	14.000	9.53	0.375	81.33	54.62	STD
14	355.6	14.000	10.31	0.406	87.79	59.00	
14	355.6	14.000	11.13	0.438	94.55	63.50	
14	355.6	14.000	11.91	0.469	100.95	67.84	
14	355.6	14.000	12.70	0.500	107.40	72.16	XS
14	355.6	14.000	14.27	0.562	120.12	80.73	
14	355.6	14.000	15.88	0.625	133.04	89.36	
14	355.6	14.000	17.48	0.688	145.76	97.91	
14	355.6	14.000	19.05	0.750	158.11	106.23	
14	355.6	14.000	20.62	0.812	170.34	114.48	
14	355.6	14.000	22.23	0.875	182.76	122.77	
14	355.6	14.000	23.83	0.938	194.98	130.98	
14	355.6	14.000	25.40	1.000	206.84	138.97	
14	355.6	14.000	26.97	1.062	218.58	146.88	
16	406.4	16.000	11.91	0.469	115.87	77.87	
16	406.4	16.000	12.70	0.500	123.31	82.85	XS
16	406.4	16.000	14.27	0.562	138.00	92.75	
16	406.4	16.000	15.88	0.625	152.94	102.72	
16	406.4	16.000	17.48	0.688	167.66	112.62	
16	406.4	16.000	19.05	0.750	181.98	122.27	
16	406.4	16.000	20.62	0.812	196.18	131.84	
16	406.4	16.000	22.23	0.875	210.61	141.48	
16	406.4	16.000	23.83	0.938	224.83	151.03	
16	406.4	16.000	25.40	1.000	238.66	160.35	
16	406.4	16.000	26.97	1.062	252.37	169.59	
1	2	3	4	5	6	7	8

Tensile requirements for PSL 1 as per API* Spec 5L

Pipes grade	Seamless or welded pipes body		
	Yield strength R _{10.5} , MPa (psi), minimum	Tensile strength R _m , MPa (psi), minimum	Elongation A _l , %, minimum
L175 or A25	175 (25,400)	310 (45,000)	a
L175P or A25P	175 (25,400)	310 (45,000)	a
L210 or A	210 (30,500)	335 (48,600)	a
L245 or B	245 (35,500)	415 (60,200)	a
L290R or X42R; L290 or X42	290 (42,100)	415 (60,200)	a
L320 or X46	320 (46,400)	435 (63,100)	a
L360 or X52	360 (52,200)	460 (66,700)	a
L390 or X56	390 (56,600)	490 (71,100)	a
L415 or X60	415 (60,200)	520 (75,400)	a
L450 or X65	450 (65,300)	535 (77,600)	a
L485 or X70	485 (70,300)	570 (82,700)	a

Tensile requirements for PSL 2 as per API* Spec 5L

Pipes grade	Seamless and welded pipes body					Elongation, A _n %, minimum
	Yield strength R _{10.8} ^b , MPa (psi)		Tensile strength R _m , MPa (psi)		R _{10.8} ^b /R _m ratio maximum	
	minimum	maximum	minimum	maximum		
L245R or BR L245N or BN	245 (35,500)	450 (65,300)	415 (60,200)	760 (110,200)	0.93	a
L290R or X42R L290N or X42N	290 (42,100)	495 (71,800)	415 (60,200)	760 (110,200)	0.93	a
L320N or X46N	320 (46,400)	525 (76,100)	435 (63,100)	760 (110,200)	0.93	a
L360N or X52N L360Q or X52Q	360 (52,200)	530 (76,900)	460 (66,700)	760 (110,200)	0.93	a
L390Q or X56Q	390 (56,600)	545 (79,000)	490 (71,100)	760 (110,200)	0.93	a
L415Q or X60Q	415 (60,200)	565 (81,900)	520 (75,400)	760 (110,200)	0.93	a
L450Q or X65Q	450 (65,300)	600 (87,000)	535 (77,600)	760 (110,200)	0.93	a
L485Q or X70Q	485 (70,300)	635 (92,100)	570 (82,700)	760 (110,200)	0.93	a
L555Q or X80Q	555 (80,500)	705 (102,300)	625 (90,600)	825 (119,700)	0.93	a

Note: determined by a formula given in API* Spec 5L.

Tensile requirements for PSL 2 for sour service as per API* Spec 5L

Pipes grade	Seamless and welded pipes body					
	Yield strength R _{10.5} ^b , MPa (psi)		Tensile strength R _m , MPa (psi)		R _{10.5} ^b /R _m ratio	Elongation, A _n , %
	max	min	max	min	max	min
L245NS or BNS	245 (35,500)	450 (65,300)	415 (60,200)	760 (110,200)	0.93	a
L290NS or X42NS	290 (42,100)	495 (71,800)	415 (60,200)	760 (110,200)	0.93	a
L360NS or X52NS L360QS or X52QS	360 (52,200)	530 (76,900)	460 (66,700)	760 (110,200)	0.93	a
L390QS or X56QS	390 (56,600)	545 (79,000)	490 (71,100)	760 (110,200)	0.93	a
L415QS or X60QS	415 (60,200)	565 (81,900)	520 (75,400)	760 (110,200)	0.93	a
L450QS or X65QS	450 (65,300)	600 (87,000)	535 (77,600)	760 (110,200)	0.93	a

Tensile requirements for PSL 2 for offshore service as per API* Spec 5L

Pipes grade	Seamless and welded pipes body					
	Yield strength R _{10.5} ^b , MPa (psi)		Tensile strength R _m , MPa (psi)		R _{10.5} ^b /R _m ratio	Elongation, A _n , %
	max	min	max	min	max	min
L245NO or BNO	245 (35,500)	450* (65,300)*	415 (60,200)	760 (110,200)	0.93	a
L290NO or X42NO	290 (42,100)	495 (71,800)	415 (60,200)	760 (110,200)	0.93	a
L360NO or X52NO	360 (52,200)	525 (76,000)	460 (66,700)	760 (110,200)	0.93	a
L390QO or X56QO	390 (56,600)	540 (78,300)	490 (71,100)	760 (110,200)	0.93	a
L415QO or X60QO	415 (60,200)	565 (81,900)	520 (75,400)	760 (110,200)	0.93	a
L450QO or X65QO	450 (65,300)	570 (82,700)	535 (77,600)	760 (110,200)	0.93	a

Note: determined by a formula given in API* Spec 5L.

Requirements for the chemical composition of heats and products in weight percents for PSL 1 as per API* Spec 5L

Steel grade (name of steel)	Mass fraction according to heat and product analysis ^a , %							
	C maximum ^b	Mn maximum ^b	P		S maximum	V maximum	Nb maximum	Ti maximum
			minimum	maximum				
L175 or A25	0.21	0.60	—	0.030	0.030	—	—	—
L175P or A25P	0.21	0.60	0.045	0.080	0.030	—	—	—
L210 or A	0.22	0.90	—	0.030	0.030	—	—	—
L245 or B	0.28	1.20	—	0.030	0.030	c, d	c, d	d
L290 or X42	0.28	1.30	—	0.030	0.030	d	d	d
L320 or X46	0.28	1.40	—	0.030	0.030	d	d	d
L360 or X52	0.28	1.40	—	0.030	0.030	d	d	d
L390 or X56	0.28	1.40	—	0.030	0.030	d	d	d
L415 or X60	0.28 ^a	1.40 ^a	—	0.030	0.030	f	f	f
L450 or X65	0.28 ^a	1.40 ^a	—	0.030	0.030	f	f	f
L485 or X70	0.28 ^a	1.40 ^a	—	0.030	0.030	f	f	f
a – Maximum 0.50% for copper, maximum 0.50% for nickel, maximum 0.50% for chromium, and maximum 0.15% for molybdenum. For steel grades or pipes grades up to and including L360/X52, Cu, Cr and Ni should not be added intentionally. b – For each 0.01% of carbon content reduction below its specified maximum content, manganese content can be increased by 0.05% above its specified maximum content to a maximum of 1.65% for grades ≥ L245 or B, but ≤ L360 or X52; a maximum of 1.75% for grades > L360 or X52, but < L485 or X70; and a maximum of 2.00% for L485 or X70. c – Unless otherwise agreed, total niobium and vanadium content should be ≤ 0.06%. d – Total content of niobium, vanadium and titanium should be ≤ 0.15%. e – Unless otherwise agreed. c – Unless otherwise agreed, total niobium, vanadium and titanium content should be ≤ 0.15%.								

Requirements for the chemical composition of heats and products in weight percents for PSL 2 as per API* Spec 5L

Steel grade (name of steel)	Mass fraction according to heat and product analysis, %, maximum									Carbon equivalent ^a , %, maximum	
	C ^b	Si	Mn ^b	P	S	V	Nb	Ti	Other	CE _{IIW}	CE _{Pcm}
L245R or BR	0.24	0.40	1.20	0.025	0.015	c	c	0.04	e	0.43	0.25
L290R or X42R	0.24	0.40	1.20	0.025	0.015	0.06	0.05	0.04	e	0.43	0.25
L245N or BN	0.24	0.40	1.20	0.025	0.015	c	c	0.04	e	0.43	0.25
L290N or X42N	0.24	0.40	1.20	0.025	0.015	0.06	0.05	0.04	e	0.43	0.25
L320N or X46N	0.24	0.40	1.40	0.025	0.015	0.07	0.05	0.04	d, e	0.43	0.25
L360N or X52N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04	d, e	0.43	0.25
L360Q or X52Q	0.18	0.45	1.50	0.025	0.05	0.05	0.05	0.04	e	0.43	0.25
L390Q or X56Q	0.18	0.45	1.50	0.025	0.015	0.07	0.05	0.04	d, e	0.43	0.25
L415Q or X60Q	0.18 ⁱ	0.45 ⁱ	1.70 ⁱ	0.025	0.015	g	g	g	h	0.43	0.25
L450Q or X65Q	0.18 ⁱ	0.45 ⁱ	1.70 ⁱ	0.025	0.015	g	g	g	h	0.43	0.25
L485Q or X70Q	0.18 ⁱ	0.45 ⁱ	1.80 ⁱ	0.025	0.015	g	g	g	h	0.43	0.25
L555Q or X80Q	0.18 ⁱ	0.45 ⁱ	1.90 ⁱ	0.025	0.015	g	g	g	i, j	As agreed	

a – According to the product analysis results. Maximum carbon equivalent for seamless pipes with t > 20,0 mm (0,787 in.) is subject to agreement. The CEIIW limit value applies if C > 0,12%. The CEPcm limit value applies if the mass fraction of C ≤ 0,12%.

b – For each 0,01% of carbon content reduction below its specified maximum content, manganese content can be increased by 0,05% above its specified maximum content to a maximum of 1,65% for grades ≥ L245 or B, but ≤ L360 or X52; a maximum of 1,75% for grades > L360 or X52, but < L485 or X70; a maximum of 2,00% for grades ≥ L485 or X70, but ≤ L555 or X80; and a maximum of 2,20% for grades > L555 or X80.

c – Unless otherwise agreed, total niobium and vanadium content should be ≤ 0,06%.

d – Total content of niobium, vanadium and titanium should be ≤ 0,15%.

e – Unless otherwise agreed, maximum 0,50% for copper, maximum 0,30% for nickel, maximum 0,30% for chromium and maximum 0,15% for molybdenum.

f – Unless otherwise agreed.

g – Unless otherwise agreed, total niobium, vanadium and titanium content should be ≤ 0,15%.

h – Unless otherwise agreed, maximum 0,50% for copper, maximum 0,50% for nickel, maximum 0,50% for chromium, and maximum 0,50% for molybdenum.

i – Unless otherwise agreed, maximum 0,50% for copper, maximum 1,00% for nickel, maximum 0,50% for chromium, and maximum 0,50% for molybdenum.

j – Maximum 0,004 0% for boron.

Requirements for the chemical composition of heats and products in weight percents
for PSL 2 sour service pipes, as per API* Spec 5L

Steel grade	Mass fraction according to heat and product analysis, %, maximum									Carbon equivalent ^a , %. maximum	
	C ^a	Si	Mn ^b	P	S	V	Nb	Ti	Other ^{c d}	CE _{IIW}	CE _{Epcm}
L245NS or BNS	0.14	0.40	1.35	0.020	0.003 ^a	f	f	0.04	g	0.36	0.19 ^h
L290NS or X42NS	0.14	0.40	1.35	0.020	0.003 ^e	0.05	0.05	0.04	—	0.36	0.19 ^h
L360NS or X52NS	0.16	0.45	1.65	0.020	0.003 ^a	0.10	0.05	0.04	g	0.43	0.22 ^h
L360QS or X52QS	0.16	0.45	1.65	0.020	0.003 ^a	0.07	0.05	0.04	g	0.39	0.20 ^h
L390QS or X56QS	0.16	0.45	1.65	0.020	0.003 ^a	0.07	0.05	0.04	g	0.40	0.21 ^h
L415QS or X60QS	0.16	0.45	1.65	0.020	0.003 ^a	0.08	0.05	0.04	g, i, k	0.41	0.22 ^h
L450QS or X65QS	0.16	0.45	1.65	0.020	0.003 ^a	0.09	0.05	0.06	g, i, k	0.42	0.22 ^h
a – According to the product analysis results (see 9.2.4 and 9.2.5). CEIIW limit values apply to carbon mass content > 0,12%, CEpcm limit values apply to carbon mass content ≤ 0,12%. b – For each 0,01% of carbon content reduction below its specified maximum content, manganese content can be increased by 0,05% above its specified maximum content but no more than by 0,20%. c – Total aluminum ≤ 0,060%, nitrogen ≤ 0,012%, AL/N ≥ 2:1 (not applicable to steels deoxidized with titanium or treated with titanium); Cu 0,35% (if agreed, Cu ≤ 0,10%); Ni ≤ 0,30%; Cr ≤ 0,30%; Mo ≤ 0,15%; B ≤ 0,0005%. d – Unless otherwise agreed, in case of welded pipes with Ca intentionally added to steel, Ca/S ≥ 1,5 if S > 0,0015%. For seamless and welded pipes, Ca content ≤ 0,006%. e – Maximum S content may be increased for seamless pipes to ≤ 0,008% and for welded pipes, by agreement, to ≤ 0,006%. In this case, a lower Ca/S ratio can be agreed for welded pipes. f – Unless otherwise agreed, total niobium and vanadium content should be ≤ 0,06%. g – Total content of niobium, vanadium and titanium should be ≤ 0,15%. h – For seamless pipes, this value may be increased by 0,03%. i – Subject to agreement, molybdenum content should be ≤ 0,35%. j – Subject to agreement, chromium content should be ≤ 0,45%. k – Subject to agreement, Cr content should be ≤ 0,45%, Ni ≤ 0,50%.											

Requirements for the chemical composition of heats and products in weight percents
for PSL 2 offshore pipes, as per API* Spec 5L

Steel grade	Mass fraction according to heat and product analysis, %, maximum									Carbon equivalent ^a , %, maximum	
	C ^a	Si	Mn ^b	P	S	V	Nb	Ti	Other ^c	CE _{IIW}	CE _{Epcm}
L245NO or BNO	0.14	0.40	1.35	0.020	0.010	d	d	0.04	e, f	0.36	0.19 ^h
L290NO or X42NO	0.14	0.40	1.35	0.020	0.010	0.05	0.05	0.04	f	0.36	0.19 ^h
L360NO or X52NO	0.16	0.45	1.65	0.020	0.010	0.10	0.05	0.04	e	0.43	0.22 ^h
L390QO or X56QO	0.16	0.45	1.65	0.020	0.010	0.07	0.05	0.04	e, h	0.40	0.21 ^h
L415QO or X60QO	0.16	0.45	1.65	0.020	0.010	0.08	0.05	0.04	e, h	0.41	0.22 ^h
L450QO or X65QO	0.16	0.45	1.65	0.020	0.010	0.09	0.05	0.06	e, h	0.42	0.22 ^h
a – According to the product analysis results (see 9.2.4 and 9.2.5). CEIIW limit values apply to carbon mass content > 0,12%, CEpcm limit values apply to carbon mass content ≤ 0,12%. b – For each 0,01% of carbon content reduction below its specified maximum content, manganese content can be increased by 0,05% above its specified maximum content but no more than by 0,20%. c – Total AL ≤ 0,060%, N ≤ 0,012%, AL/N ≥ 2:1 (does not apply to steels deoxidized with titanium or treated with titanium). d – Unless otherwise agreed, total niobium and vanadium content should be ≤ 0,06%. e – Total content of niobium, vanadium and titanium should be ≤ 0,15%. f – Cu ≤ 0,30%, Ni ≤ 0,30%, Cr ≤ 0,30%, Mo ≤ 0,10%, B ≤ 0,0005%. g – For seamless pipes, this value may be increased by 0,03% to a maximum of 0,25%. h – Cu ≤ 0,50 %, Ni ≤ 0,50%, Cr ≤ 0,50%, Mo ≤ 0,50%, B ≤ 0,0005%.											

PIPES FOR UNDERWATER PIPELINES

Such pipes are intended for the construction of underwater crossings and offshore pipelines for the transportation of liquid and gaseous hydrocarbons and other media

MANUFACTURERS

VTZ, TAGMET, TMK PS

FEATURES

Seamless steel pipes for offshore subsea pipelines are manufactured at VTZ and TAGMET.

Manufacturing method includes hot forming (rolling) of steel billet according to the technology that provides a fine-grained steel structure, required purity of steel for harmful impurities and non-metallic inclusions. Pipes undergo volumetric heat treatment according to the established manufacturing procedures for obtaining final operating characteristics.

Longitudinal electric-welded steel pipes are manufactured at TMK PS in Volzhsky and Chelyabinsk using electric arc welding.

Distinctive features of such products are strict requirements for geometric parameters (outer diameter, wall thickness, ovality, curvature), as well as requirements for the quality of the outer and inner surface of pipes.

By agreement with the Customer, pipes can be supplied with an external anti-corrosion and inner flow coating and weighted concrete covering, applied in accordance with additional technical requirements.

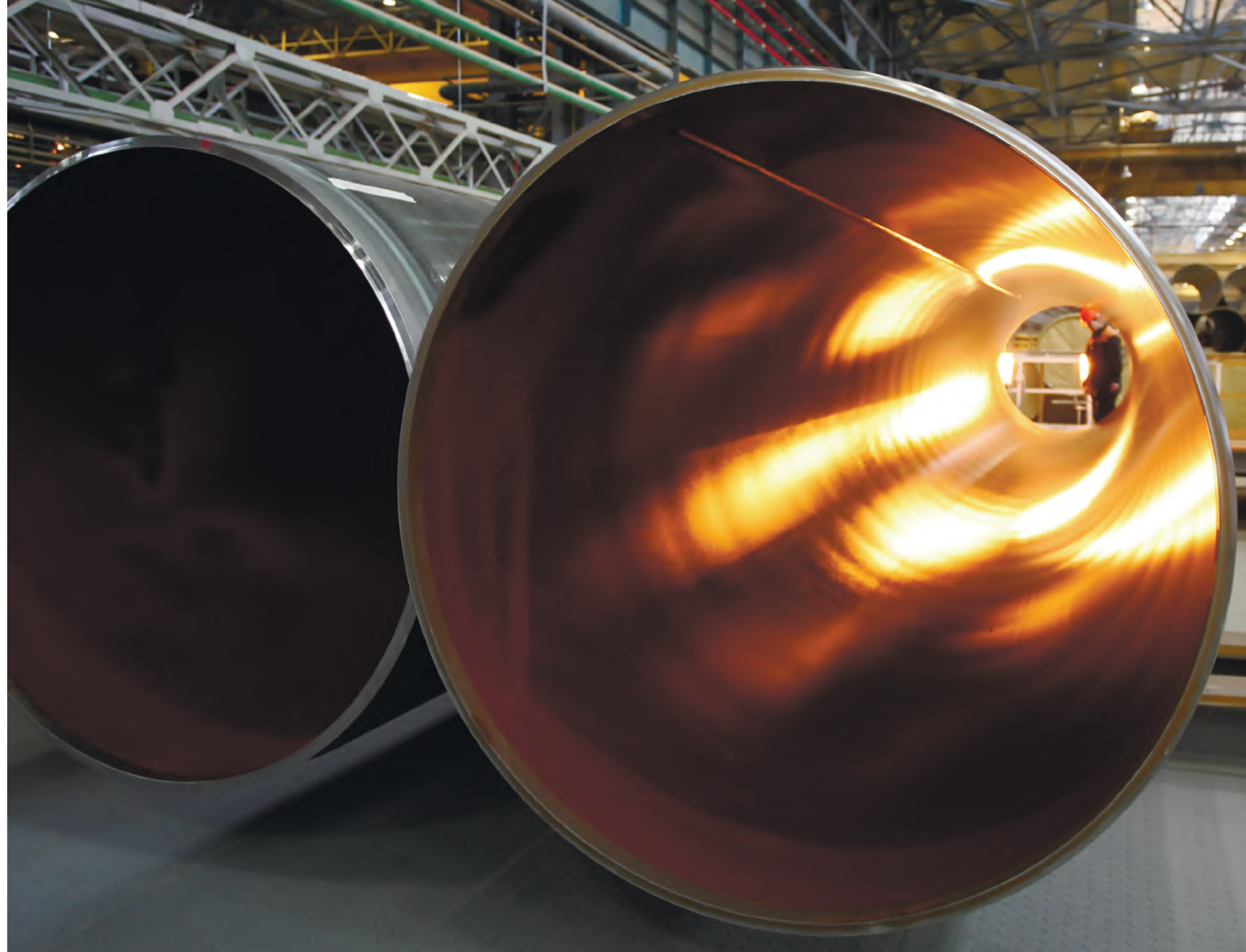
Nominal sizes of underwater pipelines shall be in accordance with requirements in Table 3.

Table 3. Standards

Standards	Pipe dimensions			Steel grade, category
	Outside diameter, mm	Wall thickness,mm	Length, mm	
1	2	3	4	5
TU 14-156-93-2012 Seamless steel pipes for offshore subsea pipelines	114-426	6.0-26.0	10.5-12.5	Categories PCT36; PCT40; PCT420; PCT500; PCT550 or steel grades X52; X60; X65; X70; X80
TU 14-3P-156-2021 Seamless steel pipes resistant to local elevated deformations for pipeline construction	114-355	10.0-25.0	8.0-12.2	X65Q; X65QO
TU 14-3P-176-2021 Seamless steel pipes resistant to local elevated deformations for pipeline construction	57-426	4.5-36.0	10.5-12.6	Steel grades K52; K56; K60 and L390; L415; L450; L485; X56; X60; X65; X70
TU 24.20.21-205-57357928-2022 Longitudinal electric-welded steel pipes with outer diameter from 530 mm to 1220 mm for offshore gas pipeline construction	530-1 220	8.0-14.0	20ΦA; 13XΦA	245-485 Mpa (SMYS)
TU 24.20.21-213-57357928-2022 Longitudinal electric-welded steel pipes for offshore subsea pipelines (PMPC)	530-820	15.0-27.0	10.5-12.35	X60; X65; X70; SAWL 415 IFD; SAWL 450 IFD; SAWL 485 IFD
TU 24.20.21-021-57357928-2022 Longitudinal electric-welded steel pipes for coastal (land) and offshore field pipelines	508; 514; 813; 820	27.0; 30.1; 30.2; 32.2; 38.7; 40.8; 45.8; 46.8	6.0-12.6	K60; X65; 450 IFD
TU 24.20.21-039-57357928-2022 Longitudinal electric-welded steel pipes for offshore pipelines	508-1 220	8.0-41.0	10.5-12.2	X60; X65; X70; SAWL 415 IFD; SAWL 450 IFD; SAWL 485 IFD
API* Spec 5L Seamless pipes LSAW pipes	168.3-426	7.1-34.8	7.5-12.5	B (L245); X42 (L290); X46 (L320); X52 (L360); X56 (L390); X60 (L415); X65 (L450); X70 (L485); X80 (L555)
	508.0-1 422.4	7.0-46.0	10.0-18.3	
DNV-ST-F101 Submarine pipeline systems (seamless)	219.0-426.0	7.0-31.0	8.0-12.5	250-450
DNV-OS-F101 Submarine pipeline systems (LSAW)	508-1 422	8.0-45.0	10.5-12.5	245-555 (F; D; I)
1	2	3	4	5

02.

Pipes for trunk pipelines



Large diameter pipes 32

Pipes with thermal insulation and waterproof coating 35

LARGE DIAMETER PIPES

Submerged arc longitudinal welded large diameter pipes are used in oil and gas trunk pipelines, including submarine pipelines, oil gathering pipelines, general purpose pipelines, thermal power plant pipelines, water pipelines, and in steel structures

MANUFACTURERS

TMK PS

FEATURES

TMK PS produces both single-seam longitudinal welded pipes at the Vysota 239 electric-weld pipe shop (Chelyabinsk), Electric-Weld Pipe Shop No. 6 (Chelyabinsk), and Electric-Weld Pipe Shop No. 1 (Volzhsky) and 1,020–1,220 mm double-seam longitudinal welded pipes made from two half-cylinders at Electric-Weld Pipe Shop No. 6 (Chelyabinsk). Electric-Weld Pipe Shop No. 6 has a section producing double-seam pipes ranging from 1,520 mm to 2,520 mm in diameter for general purposes, construction, etc. In its production, TMK PS uses all three pipe forming processes used globally to manufacture large-diameter longitudinal welded pipes: three-roll bending (TRB), press forming (UO), and step-by-step forming (JCO). The plant's production lines can produce pipes with lengths of up to 18 m and in grades up to K80 (Russian classification) and up to X100 (L690) (ISO and API classification). The site uses the most advanced technologies and highly automated processes to produce state-of-the-art pipe. The technology solutions are continuously improved, along with product quality. The hybrid laser-arc welding technology implemented and used at TMK PS to weld longitudinal pipe seams is unique in the industry.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
API* Spec 5L Specification for line pipes	508-1,422	7.1-48.0	B; X42–X80 or L245–L555
GOST 10706-76 / GOST 10704-91 Electric welded longitudinal steel pipes	508-1,420	7.0-48.0	St2kp; St2ps; St2sp; St3kp; St3ps; St3sp; low-alloy steel (Ce < 0.48%)
GOST 20295-85 Steel welded pipes for main gas-and-oil pipelines	508-1,420	7.0-48.0	K34; K38; K42; K50; K52; K54; K55; K56; K60
GOST 31447-2012 Steel welded pipes for trunk gas pipelines, oil pipelines and oil products pipelines	530-1,420	7.0-48.0	K34; K38; K42; K48; K50; K52; K54; K55; K56; K60
GOST 33228-2015 Steel welded pipes for general purposes	508-2,520	7.0-34.0	KP175–KP460
GOST R 58064-2018 Steel welded pipes for building structure	508-1,420	8.0-48.0	C245 - C440
GOST 3183-2015 Steel pipes for pipelines of petroleum and natural gas industries	508-1,422	7.0-48.0	A; B; X42; X46; X52; X56; X60; X65; X70; X80; L245; L290; L320; L360; L390; L415; L450; L485; L555
BS EN 10217-1:2002 Welded steel tubes for pressure purposes. Part 1. Non-alloy steel tubes with specified room temperature properties	508-1,422	8.0-40.0	P195TR1; P235TR1; P265TR1 P195TR2; P235TR2; P265TR2
DIN EN 10208-1 Steel pipes for pipelines for combustible fluids	508-1,422	7.9-42.0	L210GA - L300GA
DIN EN 10217-3:2019 Welded steel tubes for pressure purposes. Part 3. Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties	508-1,422	8.0-40.0	P275-P460 (N; NH; NL1; NL2)
Offshore standard DNV-OS-F101. Submarine pipeline systems	508-1,422	7.9-45.0	250 - 485
ISO 3183-2019 Petroleum and natural gas industries. Steel pipes for pipeline transportation systems	508-1,422	7.0-48.0	B; X42–X80 or L245–L555
ÖNORM EN 10219-1:2006 / ÖNORM EN 10219-2:2019 Cold formed welded structural hollow sections of non-alloy and fine grain steels. Part 1. Technical delivery conditions	508-1,422	7.0-48.0	Non-alloy steels: S235JRH; S275J0H; S275J2H; S355J0H; S355J2H; S355K2H. Fine grain steels: S275MH–S460MLH; S275NH–S460NLH
1	2	3	4

Longitudinal welded double-seam LDP product range with diameters over 1,420 mm as per GOST and TU

Outside diameter, mm	Wall thickness, mm																			
	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0
1,520																				
1,620																				
1,720																				
1,820																				
2,020																				
2,220																				
2,420																				
2,520																				

Longitudinal welded LDP product range as per GOST and TU

Outside diameter, mm	Wall thickness, mm																			
	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	27.0
530																				
630																				
720																				
820																				
1,020																				
1,220																				
1,420																				

Outside diameter, mm	Wall thickness, mm																			
	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0	45.0	46.0	48.0
530																				
630																				
720																				
820																				
1,020																				
1,220																				
1,420																				

PIPES WITH THERMAL INSULATION AND WATERPROOF COATING

Pipes with thermal insulation and waterproof coating and connecting parts are designed for construction and repair of gas pipelines, oil pipelines, water pipelines, technological and field pipelines, heating networks of underground and aboveground pipelines

MANUFACTURERS

Uralchermet, TMK-PS

FEATURES

Thermal insulation is produced by pouring mixture of polyurethane components into free space between the pipe or connecting part and protective shell which provides thermal insulation layer protection against mechanical damage, ultraviolet radiation and moisture.

Depending on the pipe laying method, protective shell is manufactured from galvanized steel for aboveground pipeline sections; from polyethylene or steel with anti-corrosion coating made of extruded polyethylene for underground pipeline sections.

At the request of the customer, pipes with thermal insulation and waterproof coating and connecting parts can be equipped with:

- conductors of the operational remote control system
- satellite tubes for heating the transported product in aboveground and underground pipelines
- barrier-type inserts made of non-combustible materials to prevent the spread of fire.

At the request of the customer, pipes and connecting parts can be treated with an anti-corrosion coating before thermal insulation is applied. Construction and type of the anti-corrosion coating is determined by the project and depends on the operating conditions of the section of the pipeline (method pipeline laying, temperature of the transported product, presence of a line heating system, etc.). As anti-corrosion coating for thermal insulation of pipes and connecting parts, extruded polyethylene coatings or epoxy powder paints should be used.

Recommended outside diameter of products with thermal insulation and waterproof coating in polyethylene shell, thickness of thermal insulation layer and thickness of polyethylene shell wall

Size

Outside diameter of steel pipe*	Outside diameter of products with thermal insulation and waterproof coating in polyethylene shell*				Nominal thickness of thermal insulation layer**		Nominal thickness of polyethylene shell wall	
	Nominal		(+) - Limit deviation					
	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
32	125	-	3,7	-	44	-	2,5	-
38	125	-	3,7	-	41		2,5	-
45	125	-	3,7	-	37,5		2,5	-
57	125	140	3,7	4,1	31,5	38,5	2,5	3,0
76	140	160	4,1	4,7	29,0	39,0	3,0	3,0
89	160	180	4,7	5,4	32,5	42,5	3,0	3,0
108	180	200	5,4	5,9	33,0	43,0	3,0	3,2
114	200	-	6,3	-	40	-	3,2	-
133	225	250	6,6	7,4	42,5	54,5	3,5	3,9
159	250	280	7,4	8,3	41,6	56,1	3,9	4,4
219	315	355	9,8	10,4	43,1	62,4	4,9	4,9
273	400	450	11,7	13,2	57,9	82,9	5,6	5,6
325	450	500	13,2	14,6	56,9	81,3	5,6	5,6
377	500	560	14,6	16,3	55,3	84,5	6,2	6,2
426	560	600; 630	16,3	16,3	60,0	79,1; 94,1	7,0	7,9
530	710	-	20,4	-	81,1	-	8,9	-
630	800	-	23,4	-	75,0	-	10,0	-
720	900	-	26,3	-	78,8	-	11,2	-
820	1000	1100	29,2	32,1	77,6	126,2	12,4	12,4
920	1100	1200	32,1	35,1	76,2	125,1	13,8	14,9
1020	1200	-	35,1	-	75,1	-	14,9	-
1220	1425	-	38,2	-	85,2	-	17,3	-
1420	1600	-	41,2	-	70,4	-	19,6	-

* In agreement with the project organization, products of alternative diameters can be used.
** Thermal insulation layer thickness is stated without taking into account the thickness of anti-corrosion coating, tolerances for deviations of the axial lines of products from the axes of protective shells and deviations of the geometric dimensions of polyethylene shells.

Recommended outside diameter of products with thermal insulation and waterproof coating in shells made of galvanized steel or steel with anti-corrosion coating made of extruded polyethylene. Thickness of thermal insulation layer.

Size

Outside diameter of steel pipe*	Size of galvanized steel shell		Size of steel shell with anti-corrosion coating made of extruded polyethylene***		Nominal thickness of thermal insulation layer**
	Outside diameter	Wall thickness****	Outside diameter	Wall thickness****	
32	125 ⁺⁵	0,55	125 ⁺⁵	0,55	45,9
38	125 ⁺⁵	0,55	125 ⁺⁵	0,55	42,9
45	125 ⁺⁵	0,55	125 ⁺⁵	0,55	39,4
57	125 ⁺⁵ ; 140 ⁺⁵	0,55	125 ⁺⁵ ; 140 ⁺⁵	1,0	33,4; 40,9
76	140 ⁺⁵ ; 160 ⁺⁵	0,55	140 ⁺⁵ ; 160 ⁺⁵	1,0	31,4; 41,4
89	160 ⁺⁵ ; 180 ⁺⁵	0,6	160 ⁺⁵ ; 180 ⁺⁵	1,0	34,9; 44,9
108	180 ⁺⁵ ; 200 ⁺⁵	0,6	180 ⁺⁵ ; 200 ⁺⁵	1,0	35,4; 45,4
133	225 ⁺⁵ ; 250 ⁺⁵	0,6	225 ⁺⁵ ; 250 ⁺⁵	1,0	45,4; 57,9
159	250 ⁺⁵ ; 280 ⁺⁵	0,7	250 ⁺⁵ ; 280 ⁺⁵	1,0	44,8; 59,8
219	315 ⁺⁵ ; 355 ⁺⁵	0,7	315 ⁺⁵ ; 355 ⁺⁵	1,0	47,3; 67,3
273	400 ⁺⁵ ; 450 ⁺⁵	0,8	400 ⁺⁵ ; 450 ⁺⁵	1,0	62,7; 87,7
325	450 ⁺⁵ ; 500 ⁺⁵	0,8	450 ⁺⁵ ; 500 ⁺⁵	1,0	61,7; 86,7
377	500 ⁺⁵ ; 560 ⁺⁵	1,0	500 ⁺⁵ ; 560 ⁺⁵	1,0	60,5; 90,5
426	560 ⁺⁵ ; 630 ⁺⁵	1,0	560 ⁺⁵ ; 630 ⁺⁵	1,0	66,0; 101,0
530	710 ⁺⁵	1,0	710 ⁺⁵	1,0	89,0
630	800 ⁺⁵	1,0	800 ⁺⁵	1,0	84,0
720	900 ⁺⁵	1,0	900 ⁺⁵	1,0	89,0
820	1000 ⁺⁵ ; 1100 ⁺⁵	1,0	1100 ⁺⁵ ; 1100 ⁺⁵	1,0	89,0; 139,0
920	1100 ⁺⁵ ; 1200 ⁺⁵	1,0	1100 ⁺⁵ ; 1200 ⁺⁵	1,0	89,0; 139,0
1020	1200 ⁺⁵	1,0	1200 ⁺⁵	1,0	89,0
1220	1425 ⁺⁵	1,0	1425 ⁺⁵	1,0	101,5
1420	1600 ⁺⁵	1,0	1600 ⁺⁵	1,0	89

* Wall thickness of the steel pipe is determined in the project. In agreement with the project organization, products of alternative diameters can be used.
** Thermal insulation layer thickness is stated without taking into account the thickness of anti-corrosion coating, tolerances for deviations of the axial lines of products from the axes of protective shells and deviations of the geometric dimensions of shells made of galvanized steel and steel with anti-corrosion extruded polyethylene coating.
*** Sizes are stated without taking into account the thickness of polyethylene of shells made of steel with anti-corrosion extruded polyethylene coating.
**** In agreement with the customer shells with alternative wall thickness can be used.

03.

Industrial pipes



General purpose seamless pipes (hot and cold-formed pipes)	40
General purpose welded pipes (pipes for water and gas supply, hollow sections and galvanized pipes)	45
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GENERAL PURPOSE SEAMLESS PIPES

(HOT AND COLD-FORMED PIPES)

Pipes for the manufacture of machine parts in the automotive, drilling, oil production, mining, crane and other machine-building sub-industries

MANUFACTURERS

VTZ, STZ, SinTZ,
TAGMET, TMK-INOX,
CHTPZ, PNTZ

FEATURES

Pipes are produced by hot, cold or warm rolling on cold pillgers or by drawing (with or without a plug). Pipes meet different requirements for dimensions, steel grades, manufacturing tolerances, mechanical properties, and surface quality, depending on the production technique and the requirements of applicable standards.

Random length pipes are manufactured with lengths between 1.5 m and 12.5 m; cut length pipes – between 4.5 m and 9 m. Cut length pipes may be produced with a length of more than 12.5 m by agreement between the parties.

Pipes are made of the following steels: 10, 20, 35, 45, 09G2S (by agreement between parties, pipes may be made of other steel grades as per GOST 1050, GOST 4543, GOST 19281, and DIN 17100).

Pipes undergo mandatory tensile testing and, if requested by the customer, hardness testing, bend, flattening, and drift-expanding.

Pipes can be made to customer specifications for dimensions and tolerances, including improved precision of wall thickness (+/-6%) and outside diameter (+/-0.5%), as well as extremely thick-walled pipes with a D/S ratio of up to 2.2 mm and a wall thickness of up to 67 mm.

Isothermal annealing and outside surface machining are available.

SPECIAL CAPABILITIES

- cold-finished pipe diameter range: 0.8 mm–180 mm; wall thickness: 0.16 mm–12.0 mm
- manufacture of pipes with non-standard dimensions
- manufacture of pipes with non-standard tolerances
- outer surface grinding
- pipes heat treatment in furnaces with oxidizing or non-oxidizing atmospheres
- manufacture of capillary tubes
- nondestructive testing of pipes
- hydraulic and pneumatic testing of pipes
- protective coating of pipes.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
ASTM A 53/A53M Standard Specification for Pipes, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	10.3-508	1.73-50	A; B; C
ASTM A106/A106M Standard Specification for Seamless Carbon Steel Pipes for High-Temperature Service	219.1-323.8	7.8-25.4	A; B; C
ASTM A179/A179M Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes	19.05-31.75	2.11-3.05	Low carbon
ASTM A210/A210M Seamless Medium-Carbon Steel Boiler and Superheater Tubes	57-127	4.0-28.0	A-1; C
ASTM A333/A333M Standard Specifications for Seamless and Welded Steel Pipes for Low-Temperature Service and Other Applications with Required Notch Toughness	33.4-323.8	1.65-19.05	Group 6
	48.3-168.3	5-22.2	1; 6
	219.1	8.18-30.4	
	273.0	7.08-34.9	
	323.8	9.53-33.32	
	355.6	9.53-27.79	
	406.4	9.53; 10.31-28.58	
ASTM A335/335M Standard Specification for Seamless Ferritic Alloy-Steel Pipes for High-Temperature Service	26.7-60.3	3.18-5.54	P-5
ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes	23.0-76.0	2.0-10.0	A; B; C
ASTM A519/A519M Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing	21.3-73	2.77-9.53	1010
DIN EN 10210 (DIN 2448) Hot finished structural hollow sections of non-alloy and fine grain steels (circular)	10.2-108*	1.6-12.0	S235JRH; S355J2H S275J0H; S275J2H; S355J0H
DIN EN 10210-1/2 Hot finished steel structural hollow sections. Part 1. Technical delivery conditions. Part 2. Tolerances, dimensions and sectional properties	33.7-323.9	3.2-25	S355J2H; S235JRH; S275J0H; S275J2H; S355J0H; S355K2H; S355J2H
DIN EN 10216-1 (DIN 1629, DIN 1630) Seamless steel tubes for pressure purposes. Technical delivery conditions	32-426	2.9-55.0	St. 37.0; St. 44.0; St. 52.0; St.37.4; St. 44.4; St. 52.4
DIN 2448 Seamless Steel Pipes and Tubes. Dimensions, Conventional Masses per Unit Length	10.2-108*	1.6-12.0	
DIN 10216-1:2004 Seamless steel tubes for pressure purposes	10.2-273.0	1.6-25.0	P195TR1; P235TR1; P265TR1; P195TR2; P235TR2; P265TR2
DIN EN 10224 (DIN 2460) Non-alloy steel tubes and fittings for the conveyance of water and other aqueous liquids. Technical delivery conditions	219.1-323.9	8.0-25.0	St 37.4; St 44.4; St 52.4
DIN EN 10255 (DIN 2440) Non-alloy steel tubes suitable for welding and threading. Technical delivery conditions	10.2-76.1	2.0-3.65	St 33.2
DIN EN 10255 (DIN 2441) Non-alloy steel tubes suitable for welding and threading. Technical delivery conditions	10.2-76.1	2.65-4.5	St 33.2; S195T
DIN 17121 Seamless circular steel tubes for structural steelwork	10.2-76.1	1.0-6.3	St 37.2; St 44.2; St 52.3; St 37.3; St 44.3
DIN 17175 Seamless tubes of heat-resistant steels	10-88.9	2-10	St 35.8; St 45.8
DIN 2440/2441 Steel tubes medium-weight suitable for screwing. Steel tubes heavy-weight suitable for screwing	26.9-76.1*	2.65-4.5	St 33
EN 10305-4 Seamless cold drawn tubes for hydraulic and pneumatic power systems	6.0-90.0*	0.5-6.0	E235; E355; C45E
GOST 14162-79 Steel tubes of small dimensions (capillary)	0.8-5.0	0.1-1.6	Corrosion-resistant steels and alloys according to GOST 5632-72; GOST 10994-74
GOST 8645-68/13663-86 Rectangular steel tubes	30x20-150x100*	2.5-10	10; 20; 35; 45; 09G2; 09G2S; 10G2
GOST 8732-78, GOST 8731-74 Seamless hot-formed steel pipes	38-550	3.5-90	10–70; 10Kh–45Kh; 18KhGT; 30KhGSA; etc. by agreement
	32-219	2.9-50	10; 20; 35; 45; 09G2S; 10G2; D; 13KhFA; 30KhGSA; 30KhMA; 40Kh; etc. by agreement
GOST 8733-74 Seamless cold and hot-formed pipes. Specifications GOST 8734-75 Seamless steel tubes cold-formed GOST 32678-2014 Seamless and welded cold-formed steel pipes for general purposes. Specifications	4.0-426	0.4-40	10; 20; 35; 45; 10G2; 20H; 40Kh; 30KhGSA; 15KhM and others by agreement
1	2	3	4

Standards (continued)

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
GOST 11017-80 Steel seamless tubes for high pressure service*	6–10 (Group A)	1.6–3 (Group A)	20
	6–25 (Group B)	2–10 (Group B)	
GOST 12132-66 Electrically welded and seamless steel tubes for automotive and bicycle industries	6-57*	0.8-5.0	10; 20; 15Kh; 35; 45; 30KhGSA; 30KhMA
GOST 19277-2016 Seamless steel tubes for oil and fuel lines. Technical requirements.	5-60*	0.8-3	20A; 30KhGSA; 30KhGSA-VD
GOST 21729-76 Cold-formed and hot-formed structural carbon and alloyed steel tubes	4.0-159.0	0.4-12	20A; 45; 38KhA; 30KhGSA; 38Kh2MYuA; 12KhN3A; 12Kh2NVFA (EI-712); 30KhGSA-VD; 30KhGSN2A
GOST 22897-2023 Seamless cold-formed pipes from alloys based on titanium TU 14-3-615-77 Cold-formed seamless pipes from PT-1M and PT-7M alloys TU 14-3-820-79 Seamless cold-formed pipes from alloys based on titanium TU 14-3-843-79 Seamless extremely thin-walled pipes from PT-1M and PT-7M alloys	5.0-50	1.0-5.5	VT1-0; PT-1M; PT-7M
GOST 23270-89 Tubes-billets for mechanical treatment. Specifications	38-426	3.5-55	10; 20; 35; 45; 2 OKh; 40Kh; 30KhGSA and other steel grades
GOST 30563-98 Seamless cold-formed carbon and alloy steel tubes for special purposes	100-220	2.5-18	10; 20; 10G2A; 15KhM; 30KhMA; 09G2S
GOST 30564-98 Seamless hot-formed carbon and alloy steel tubes with special properties	38-426	3.5-55	10; 20; 09G2S and other steel grades
GOST 32528-2013 Seamless hot-formed steel pipes	38-550	3.5-90	10; 20; 35; 45; 20Kh; 40Kh; 30KhGSA; 05G2S and other steel grades
	32-219	2.9-50	10; 20; 35; 45; 09G2S; 10G2; D; 13KhFA; 30KhGSA; 30KhMA; 40Kh; etc. by agreement
1	2	3	4

* Cold-formed.

Mechanical properties of seamless standard pipes

Standards	Steel grade (pipes grade)	Ultimate tensile strength σ_u , N/mm ²	Yield strength, σ_y , N/mm ²	Yield strength, δ , %
		min		
GOST 8731-74	10	353	216	24
	20	412	245	21
	35	510	294	17
	45	588	323	14
	10G2	421	265	21
	20Kh	431	—	16
	40Kh	657	—	9
	30KhGSA	686	—	11
	15KhM	431	225	21
ASTM A53/A53M	A	330	205	ASTM formula
	B	415	240	ASTM formula

Range of seamless hot-formed standard pipes as per GOST 8732-78

Outside diameter, mm	Wall thickness/ mm																													
	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11	12	14	16	17	18	20	22	25	28	30	32	36	40	45	50	55		
	Weight per meter length, kg																													
28*	1.85	2.11	2.37	2.61																										
32*	2.15	2.46	2.76	3.05	3.33																									
38	2.59	2.98	3.35	3.72	4.07	4.41	4.74				6.91	7.32	7.69																	
42	2.89	3.32	3.75	4.16	4.56	4.95	5.33	6.04	6.71	7.32	7.89	8.41																		
45	3.11	3.58	4.04	4.49	4.93	5.36	5.77	6.56	7.30	7.99	8.63	9.22	9.77																	
50	3.48	4.01	4.54	5.05	5.55	6.04	6.51	7.42	8.29	9.10	9.86	10.60	11.20	12.40																
54	3.77	4.36	4.93	5.49	6.04	6.58	7.10	8.11	9.07	9.99	10.90	11.70	12.40	13.80	15.00	15.50														
57	4.00	4.62	5.23	5.83	6.41	6.99	7.55	8.63	9.67	10.70	11.60	12.50	13.30	14.90	16.20	16.80	17.30													
60	4.22	4.88	5.52	6.16	6.78	7.39	7.99	9.15	10.30	11.30	12.30	13.30	14.20	15.90	17.40	18.00	18.60	19.70												
63	4.44	5.14	5.82	6.49	7.15	7.80	8.43	9.67	10.90	12.00	13.10	14.10	15.10	16.90	18.50	19.30	20.00	21.20												
68	4.81	5.57	6.31	7.05	7.77	8.48	9.17	10.50	11.80	13.10	14.30	15.50	16.60	18.60	20.50	21.40	22.20	23.70												
70	4.96	5.74	6.51	7.27	8.01	8.75	9.47	10.90	12.20	13.50	14.80	16.00	17.20	19.30	21.30	22.20	23.10	24.70												
73		6.00	6.81	7.60	8.38	9.16	9.91	11.40	12.80	14.20	15.50	16.80	18.10	20.40	22.50	23.50	24.40	26.10												
76		6.26	7.10	7.93	8.75	9.56	10.40	11.90	13.40	14.90	16.30	17.60	18.90	21.40	23.70	24.70	25.80	27.60												
83			7.79	8.71	9.62	10.50	11.40	13.10	14.80	16.40	18.00	19.50	21.00	23.80	26.40	27.70	28.90	31.10	33.10											
89			8.38	9.38	10.40	11.30	12.30	14.20	16.00	17.80	19.50	21.20	22.80	25.90	28.80	30.20	31.50	34.00	36.40											
95			8.98	10.04	11.10	12.10	13.20	15.20	17.20	19.10	21.00	22.80	24.60	28.00	31.20	32.70	34.20	37.00	39.60	43.20	46.26									
102			9.67	10.82	12.00	13.10	14.20	16.40	18.50	20.60	22.70	24.70	26.60	30.40	33.90	35.60	37.30	40.40	43.40	47.50	51.10	53.30								
108			10.26	11.49	12.70	13.90	15.10	17.40	19.70	22.00	24.20	26.30	28.40	32.50	36.30	38.20	40.00	43.40	46.70	51.20	55.20	57.70								
114					13.40	14.70	16.00	18.50	20.90	23.30	25.70	27.90	30.20	34.50	38.70	40.70	42.60	46.40	49.90	54.90	59.40	62.10								
121					14.30	15.70	17.00	19.70	22.30	24.90	27.40	29.80	32.30	36.90	41.40	43.60	45.70	49.80	53.70	59.20	64.20	67.30	70.20							
127					15.00	16.50	17.90	20.70	23.50	26.20	28.90	31.50	34.00	39.00	43.80	46.10	48.40	52.80	57.00	62.90	68.40	71.80	75.00							
133					15.80	17.30	18.80	21.80	24.70	27.50	30.30	33.10	35.80	41.10	46.20	48.60	51.10	55.70	60.20	66.60	72.50	76.20	79.70	86.10						
140					16.60	18.20	19.80	23.00	26.00	29.10	32.10	35.00	37.90	43.50	48.90	51.60	54.20	59.20	64.00	70.90	77.30	81.80	85.20	92.30						
146					17.40	19.10	20.70	24.00	27.20	30.40	33.50	36.60	39.70	45.60	51.30	54.10	56.80	62.10	67.30	74.60	81.50	85.80	90.00	97.70	104.60					
152					18.10	19.90	21.60	25.00	28.40	31.70	35.00	38.30	41.40	47.60	53.70	56.50	59.50	65.10	70.50	78.30	85.60	90.30	94.70	103.00	110.50					
159					19.00	20.80	22.60	26.20	29.80	33.30	36.70	40.20	43.60	50.10	56.40	59.50	62.60	68.60	74.30	82.60	90.50	95.40	100.20	109.20	117.40					
168							24.00	27.80	31.60	35.30	39.00	42.60	46.20	53.20	60.00	63.30	66.60	73.00	79.20	88.20	96.70	102.10	107.30	117.20	126.30	136.50				
180							29.87	33.90	38.00	41.90	45.80	49.70	57.30	64.70	68.30	71.90	78.90	85.70	95.60	105.00	111.00	116.80	127.80	138.10	149.80					
194							27.82	32.28	36.70	41.10	45.40	49.60	53.90	62.10	70.20	74.20	78.10	85.80	93.30	104.20	114.90	121.30	127.80	140.30	151.90	165.40	177.60			
203							29.15	33.84	38.50	43.10	47.60	52.10	56.50	65.30	73.80	78.00	82.10	90.30	98.20	109.70	120.80	128.00	134.90	148.30	160.80	175.30	188.70	200.74		
219							31.50	36.60	41.60	46.60	51.50	56.40	61.30	70.80	80.10	84.70	89.20	98.20	106.90	119.60	131.90	139.80	147.60	162.50	176.60	193.10	208.40	222.45		
245								46.80	52.40	58.00	63.50	69.00	79.80	90.40	95.60	100.80	111.00	121.00	135.60	149.80	159.10	168.10	185.60	202.20	222.00	240.50				
273							45.92	52.30	58.60	64.90	71.10	77.20	89.40	101.40	107.30	113.20	124.80	136.20	152.90	169.18	179.78									
325								62.50	70.10	77.70	85.20	92.60	107.40	121.90	129.10	129.10	150.40	164.40	185.00											
351										84.10	92.20	100.30	116.40	132.20	140.00	147.80	163.30	178.50	201.00											
426											102.59	112.58	122.50	142.20	161.80	171.50	181.10	200.20	219.20	247.20										

Size range

Outside diameter, mm	Wall thickness, mm																		
	0.8	1.0	1.2	1.4	1.5	1.6	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.5	4.0	4.5	5.0	5.5	6.0
	Weight per meter length, kg																		
5	0.083	0.099	0.112	0.124	0.129														
6	0.103	0.123	0.142	0.159	0.166	0.174	0.186	0.197											
7	0.122	0.148	0.172	0.193	0.203	0.213	0.231	0.247	0.260	0.277									
8	0.142	0.173	0.201	0.228	0.240	0.253	0.275	0.296	0.315	0.339									
9	0.162	0.197	0.231	0.262	0.277	0.292	0.320	0.345	0.369	0.401									
10	0.182	0.222	0.260	0.297	0.314	0.332	0.364	0.395	0.426	0.462	0.497	0.518	0.537	0.561					
11	0.201	0.247	0.290	0.331	0.351	0.371	0.408	0.444	0.477	0.524	0.566	0.592	0.616	0.647					
12	0.221	0.271	0.320	0.366	0.388	0.410	0.453	0.532	0.586	0.635	0.666	0.694	0.734						
13	0.241	0.296	0.349	0.401	0.425	0.450	0.497	0.543	0.586	0.647	0.704	0.740	0.773	0.820	0.888				
14	0.260	0.321	0.379	0.435	0.462	0.489	0.542	0.592	0.640	0.709	0.773	0.814	0.852	0.906	0.986				
15	0.280	0.345	0.408	0.470	0.499	0.529	0.586	0.641	0.694	0.771	0.842	0.888	0.931	0.993	1.085				
16	0.300	0.370	0.438	0.504	0.536	0.568	0.630	0.691	0.749	0.832	0.911	0.962	1.010	1.079	1.184	1.276	1.356		
17	0.320	0.395	0.468	0.539	0.573	0.608	0.675	0.740	0.803	0.894	0.981	1.036	1.089	1.165	1.282	1.387	1.480		
18	0.339	0.419	0.497	0.573	0.610	0.647	0.719	0.789	0.857	0.956	1.050	1.110	1.168	1.252	1.381	1.498	1.603		
19	0.359	0.444	0.527	0.608	0.647	0.687	0.764	0.838	0.911	1.017	1.119	1.184	1.247	1.338	1.480	1.609	1.726		
20	0.379	0.469	0.556	0.642	0.684	0.726	0.808	0.888	0.966	1.079	1.188	1.258	1.326	1.424	1.578	1.720	1.850	1.967	2.072
21	0.399	0.493	0.586	0.677	0.721	0.765	0.852	0.937	1.020	1.141	1.257	1.332	1.405	1.511	1.677	1.831	1.973	2.102	2.220
22	0.418	0.518	0.616	0.711	0.758	0.805	0.897	0.986	1.074	1.202	1.326	1.406	1.484	1.597	1.776	1.942	2.096	2.238	2.368
23	0.438	0.543	0.645	0.746	0.795	0.844	0.941	1.036	1.129	1.264	1.395	1.480	1.563	1.683	1.874	2.053	2.220	2.374	2.515
24	0.458	0.567	0.675	0.780	0.832	0.884	0.985	1.085	1.183	1.326	1.464	1.554	1.641	1.769	1.973	2.164	2.343	2.509	2.663
25	0.477	0.592	0.704	0.815	0.869	0.923	1.030	1.134	1.237	1.387	1.533	1.628	1.720	1.856	2.072	2.275	2.466	2.645	2.811
26	0.497	0.617	0.734	0.849	0.906	0.963	1.074	1.184	1.291	1.449	1.602	1.702	1.800	1.942	2.170	2.386	2.589	2.781	2.959
27	0.517	0.641	0.764	0.884	0.943	1.002	1.119	1.233	1.346	1.511	1.671	1.776	1.878	2.208	2.269	2.497	2.713	2.916	3.107
28	0.537	0.666	0.793	0.918	0.980	1.042	1.163	1.282	1.400	1.572	1.740	1.850	1.957	2.115	2.368	2.608	2.836	3.052	3.255
30	0.576	0.715	0.852	0.987	1.054	1.121	1.252	1.381	1.508	1.695	1.878	1.998	2.115	2.287	2.565	2.830	3.083	3.323	3.551
32	0.616	0.764	0.911	1.056	1.128	1.200	1.341	1.480	1.617	1.819	2.016	2.146	2.273	2.460	2.762	3.052	3.329	3.594	3.847
34	0.655	0.814	0.971	1.126	1.202	1.278	1.429	1.578	1.725	1.942	2.154	2.294	2.430	2.633	2.959	3.274	3.576	3.866	4.143
35	0.675	0.838	1.000	1.160	1.239	1.318	1.474	1.628	1.780	2.004	2.223	2.367	2.510	2.719	3.058	3.385	3.699	4.001	4.291
36	0.694	0.863	1.030	1.195	1.276	1.357	1.518	1.677	1.834	2.065	2.293	2.441	2.588	2.805	3.157	3.496	3.822	4.137	4.439
38	0.734	0.912	1.089	1.264	1.350	1.436	1.607	1.776	1.942	2.189	2.431	2.589	2.746	2.978	3.354	3.718	4.069	4.408	4.735
40	0.773	0.962	1.148	1.333	1.424	1.515	1.696	1.874	2.051	2.312	2.569	2.737	2.904	3.150	3.551	3.940	4.316	4.680	5.031
42		1.011	1.207	1.402	1.498	1.594	1.785	1.973	2.159	2.435	2.707	2.885	3.062	3.323	3.749	4.162	4.562	4.951	5.327
45		1.085	1.296	1.505	1.609	1.712	1.918	2.121	2.322	2.620	2.914	3.107	3.299	3.582	4.044	4.495	4.932	5.358	5.771
48		1.159	1.395	1.609	1.720	1.831	2.051	2.269	2.435	2.805	3.121	3.329	3.535	3.841	4.340	4.827	5.302	5.765	6.215
50		1.208	1.444	1.678	1.794	1.910	2.140	2.368	2.594	2.929	3.259	3.477	3.693	4.014	4.538	5.049	5.549	6.036	6.511
51				1.712	1.831	1.949	2.184	2.417	2.648	2.990	3.328	3.551	3.772	4.100	4.636	5.160	5.672	6.172	6.659
53				1.782	1.905	2.028	2.273	2.515	2.756	3.114	3.466	3.699	3.930	4.273	4.834	5.382	5.919	6.443	6.955
54				1.816	1.942	2.068	2.317	2.565	2.810	3.175	3.535	3.773	4.009	4.359	4.932	5.493	6.042	6.578	7.103
56				1.885	2.016	2.147	2.406	2.663	2.919	3.298	3.674	3.921	4.167	4.532	5.130	5.715	6.289	6.850	7.398
57				1.920	2.053	2.186	2.450	2.713	2.973	3.360	3.743	3.995	4.246	4.618	5.228	5.826	6.412	6.985	7.546
60				2.023	2.164	2.304	2.584	2.861	3.136	3.545	3.950	4.217	4.482	4.877	5.524	6.159	6.782	7.392	7.990
63				2.127	2.275	2.423	2.717	3.009	3.499	3.730	4.157	4.439	4.719	5.136	5.820	6.492	7.152	7.799	8.434
65				2.196	2.349	2.502	2.806	3.107	3.407	3.853	4.295	4.587	4.877	5.308	6.017	6.714	7.398	8.070	8.730
68				2.299	2.460	2.620	2.939	3.255	3.570	4.038	4.502	4.809	5.113	5.567	6.313	7.047	7.768	8.477	9.174
70				2.368	2.534	2.699	3.027	3.354	3.673	4.162	4.640	4.957	5.271	5.740	6.511	7.269	8.015	8.749	9.470
73				2.472	2.645	2.817	3.161	3.502	3.841	4.347	4.847	5.179	5.508	5.999	6.807	7.602	8.385	9.156	9.914
75												5.327	5.666	6.172	7.004	7.824	8.631	9.427	10.210
76												5.401	5.745	6.258	7.103	7.935	8.755	9.562	10.358
80												5.697	6.060	6.603	7.497	8.379	9.248	10.105	10.950

GENERAL PURPOSE WELDED PIPES

(PIPES FOR WATER AND GAS SUPPLY, HOLLOW SECTIONS AND GALVANIZED PIPES)

General purpose welded pipes for water and gas supply and hollow sections are designed for use in the machine building, utility, construction, and other industries

MANUFACTURERS

STZ, TMK-CPW, TAGMET, PNTZ

FEATURES

Welded pipes are made by induction seam welding or furnace welding, with or without normalization of the whole pipes volume, local heat treatment of weld seams and hot reduction.

Such normalization, local heat treatment of weld seams and hot reduction result in uniform properties of the parent and weld metal as well as high strength and toughness characteristics.

Pipes welding with oxygen supplied to strip edges improves weld seam quality.

Pipes are supplied with outer and inner surfaces galvanized or non-galvanized, depending on the customer’s requirements. Pipes are galvanized by hot dipping in zinc melt, with the resulting zinc coating thickness of no less than 30 mm.

Strength properties are controlled by bend, cold drift-expanding, and flattening testing.

Water and gas line pipes with sizes between 15 mm and 50 mm can be supplied with plain ends or with thread and couplings, or with plain ends and with couplings. Anti-corrosion coating can be applied to non-galvanized pipes at the customer’s request.

At the customer’s request, all welded pipes can be supplied with caps protecting pipes ends against damage and corrosion.

Pipes can be supplied with removed internal flash. Welded pipes is delivered in carloads or in small batches by truck.

SPECIAL CAPABILITIES

Wide range of pipes with diameters from 3.2 mm to 530 mm inclusive.

Equipment for the following operations:

- galvanizing of outer and inner surface of pipe
- pipe heat treatment (normalization)
- local heat treatment of welded seams
- hydrostatic testing of pipes
- nondestructive testing of welded seams and pipes body
- application of protective coating to pipe surface
- pipe bundling.

Standards

Standards	Dimensions of pipes and sections		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
API* Spec 5CT/ISO 11960 Specification for Casing and Tubing	168.28-508	10.3-12	N-80; J-55; K55
API* Spec 5L Specification for Line Pipes	88.9-219.1	3.96-6.35	A25; A; B; X42
GOST 3262-75 Water-supply and gas-supply steel pipes	17.0-114.0	2.5-4.5	as per GOST 380-2005 and GOST 1050-2013
	21.3-114	4-11.5	
GOST 5005-82 Steel electrical welded cold-formed tubes for cardan shafts	ins. 45 ins. 46 ins. 55 ins. 66	2.5 2.5 2.0; 2.5 1.6	08kp; 08ps; 10; 10ps; 15; 15ps; 20; 20ps
GOST 8639-82 Square steel tubes	40x40	2	2ps
GOST 8645-68 Rectangular steel tubes	60x40	2	2ps
GOST 10704-91 (GOST 10705-80) Electric welded longitudinal steel pipes	12-70	0.8-3.0	08; 08kp; 08ps; 08Yu; 10; 10kp; 10ps; 15; 15kp; 15ps; 20; 20kp; 20ps; St1sp; St1kp; St1ps; St2sp; St2kp; St2ps; St3sp; St3kp; St3ps; St4sp; St4kp; St4ps; 09G2S
GOST 10705-80 Electrically welded steel tubes. Range as per GOST 10704-91. For pipelines and various structures	16-530	2-12	08kp; 08ps; 08Yu; 08; 10kp; 10ps; 10; 15kp; 15ps; 15; 20kp; 20ps; 20; St2kp; St2ps; St2sp; St3kp; St3ps; St3sp; St4kp; St4ps; St4sp; 22GYu; 09G2S; 17G1S; 13KhFA; 17G1S-U
GOST 10707-80 Steel cold formed electrically welded tubes	16-30 32-60	1.0-1.5 1.0-2.5	08; 08kp; 08ps; 10; 10kp; 10ps; 15; 15kp; 15ps; 20; 20kp; 20ps; St1sp; St1kp; St1ps; St2sp; St2kp; St2ps; St3sp; St3kp; St3ps; St4sp; St4kp; St4ps
GOST 32678-2014 Seamless and welded cold-formed steel pipes for general purposes	6 6-12	1.0 0.7-1.0	08Yu
GOST 13663-86 Shaped steel tubes. Technical requirements. Range as per GOST 8639-82, GOST 8645-68	15x15; 20x20; 25x25; 28x25; 30x15; 30x20; 30x30; 35x15; 30x60; 20x40; 40x40; 40x25; 50x20; 50x25; 40x28; 50x50; 60x30; 60x40; 60x60; 80x40	1-4	St2; St3; 08; 08kp; 08ps; 10ps; 10; 20
GOST 20295-85 Steel welded pipes for main gas-and-oil pipelines Specifications	114; 127; 133; 146; 530; 159; 168; 219; 245; 273; 325; 377; 426; 530	3.5-12	K34-K60
GOST 30245-2003 Steel bent closed welded square and rectangular section for building Specifications	40-60x25-60; 80x40; 150x150; 120x60; 140x60; 100-250x80-200; 80-120x80-120; 120x60; 120x80; 140x60; 140x100; 150x100; 160x80	3-5	St2; St3; 10; 20; 22GYu; 09G2S
	100x100; 120x120; 140x140; 160x160	3.5-6.0	
DIN 1626 Welded circular unalloyed steel tubes subject to special requirements (DIN EN 10296-1 Welded circular steel tubes for mechanical and general engineering purposes)	12-63.5	0.8-3.2	St 37;0; USt 37;0; St 44;0
DIN EN 10208-1 Steel pipes for pipelines for combustible fluids. Technical delivery conditions	21.3-219.1	6-11.5	L210GA; L235GA; L245GA; L290GA; L360GA
DIN EN 10217-1 Welded steel tubes for pressure purposes. Technical delivery conditions	21.3-508	6-11.5	P195TR1; P195TR2; P235TR1; P235TR2; P265TR1; P265TR2
DIN EN 10219-1/2 Cold formed welded structural hollow sections of non-alloy and fine grain steels	76.1-508.0; 100x100; 120x60; 120x80; 120x120; 150x100; 160x80; 180x180; 200x200; 250x150	6.0-12.0	S235JRH; S275J0H; S275J2H; S355J0H; S355J2H
DIN EN 10224 Non-alloy steel tubes and fittings for the conveyance of water and other aqueous liquids	21.3-219.1	6-11.5	L235; L275; L355
DIN EN 10255 Non-alloy steel tubes suitable for welding and threading. Technical delivery conditions	21.3-114.3	2.3-4.5	S195T
	17.0-114.3	2.3-4.5	
DIN EN 10296-1 Welded circular steel tubes for mechanical and general engineering purposes	12-63.5	0.8-3.0	RS1 34-2; RS1 37-2; St 44-2; E195; E235; E275; E355
	21.3-219.1	6-11.5	E155; E190; E195; E220; E235; E260; E275; E320; E355; E370
EN 10305-2 Steel tubes for precision applications. Technical delivery conditions. Welded cold drawn tubes	16-30	1.0-1.5	E195; E235; E275; E355
	32-60	1.0-2.5	
1	2	3	4

Welded pipes range

Outside diameter, mm	Wall thickness, mm																												
	0.8	1.0	1.2	1.5	1.8	1.9	2.0	2.2	2.3	2.5	2.65	2.8	3.0	3.2	3.5	3.65	3.8	4.0	4.5	5.0	5.5	6.0	7.0	8.0					
	Weight per meter length, kg																												
10		0.222	0.260																										
12		0.271	0.320	0.388																									
16	0.300	0.370	0.438	0.536			0.691																						
18		0.419	0.497	0.610	0.719		0.789																						
19	0.359	0.444	0.527	0.647	0.764		0.838																						
20	0.379	0.469	0.556	0.684	0.808		0.888																						
21.3									1.08	1.16		1.28		1.43															
22	0.418	0.518	0.616	0.758			0.986	1.07																					
25		0.592	0.704	0.869	1.03		1.13			1.39																			
28			0.793	0.980	1.16		1.28	1.40		1.57		1.66																	
30		0.715	0.852	1.05	1.25		1.38			1.70	1.79	1.88	2.00	2.11	2.29														
32		0.764	0.911	1.13	1.34		1.48			1.82	1.92	2.02	2.15	2.27	2.46														
33										1.88		2.09	2.22																
33.7										1.92		2.13	2.27																
37		0.838		1.24								2.12																	
38			1.09	1.35	1.61		1.78			2.19																			
40			1.15	1.42	1.70		1.87	2.05		2.31		2.57	2.74																
42										2.44	2.57	2.71	2.89	3.06	3.32	3.45	3.58	3.75											
43				1.54								2.73																	
45			1.30	1.61	1.92		2.12			2.62																			
48				1.72						2.81	2.96	3.12	3.33	3.54	3.84	3.99	4.14	4.34											
51				1.83	2.18		2.42			2.99			3.55																
57				2.05	2.45		2.71			3.36	3.55	3.74	4.00	4.25	4.62	4.80	4.99	5.23	5.83	6.41									
60				2.16	2.58		2.86			3.55	3.75	3.95	4.22	4.48	4.88	4.88	5.27	5.52	6.16	6.78									
63.5				2.29	2.74	2.89	3.03			3.76			4.48		5.18		5.87												
73										4.35		4.85	5.18	5.51	6.00		6.48	6.81											
76				2.76	3.29		3.65	4.00		4.53		5.05	5.40	5.75	6.26	6.51	6.77	7.10	7.93	8.75									
80				2.90	3.47	3.66	3.85	4.22				5.33	5.70																
89							4.29			5.33		5.95	6.36	6.77	7.38	7.68	7.98	8.38	9.38	10.36	11.33	12.28							
89.3																7.38													
90																		8.48											
102							4.93	5.41		6.13		6.85	7.32	7.80	8.50	8.85	9.20	9.67	10.82	11.96	13.09	14.21							
108										6.50		7.26	7.77	8.27	9.02	9.39	9.76	10.26	11.49	12.70	13.90	15.09							
114										6.87		7.68	8.21	8.74	9.54	9.93	10.33	10.85	12.15	13.44	14.72	15.98	18.47						
127													9.18	9.77	10.66	11.10	11.55	12.13	13.60	15.04	16.48	17.90							
133										8.05		8.99	9.62	10.24	11.18	11.64	12.11	12.73	14.26	15.78	17.29	18.79							
146													10.58		12.30			14.01	15.71	17.39	19.06	20.72	24.00	27.23					
152														11.02	11.74	12.82	13.35	13.89	14.60	16.37	18.13	19.87	21.60	25.03	28.41				
152.4											9.79		11.05																
159										9.65		10.79	11.54	12.30	13.42	13.98	14.52	15.29	17.15	18.99	20.82	22.64	26.24	26.24					
168													12.21	13.01				16.18	18.14	20.10	22.04	23.97	27.79	31.57					
177.8																				21.31	23.27	25/2	29.49	33.50					
193.7																				23.27	25.53	27.77	32.23	36.64					
219															18.60		20.17	21.21	23.80	26.39	28.96	31.52	36.60	41.63					

Welded pipes range

Outside diameter, mm	Wall thickness, mm									
	5.0	5.5	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
	Weight per meter length, kg									
244.5	29.53	32.42	35.42	41.00	46.66	52.27				
273	32.05	36.28	39.51	45.92	52.28	58.60	64.86			
325	39.46	43.38	47.20	54.90	62.54	70.14	77.68			
355.6			51.73	60.18	68.58	76.93	85.23			
377			54.90	63.87	72.80	81.68	90.51			
406.4			59.25	68.95	78.60	88.20	97.76	107.72	116.72	
426			62.15	72.33	82.47	92.55	102.59	112.58	122.52	
530			77.54	90.29	102.99	115.64	128.24	140.79	153.30	165.75

Welded hollow section range

Size, mm	Wall thickness, mm																			
	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.5	3.8	4.0	4.2	4.5	5.0	7.0	8.0	9.0	10.0
	Weight per meter length, kg																			
15 x 15	0.426	0.501	0.605																	
20 x 20	0.583	0.689	0.841	0.985	1.08															
25 x 25	0.740	0.877	1.07	1.27	1.39	1.48	1.68	1.79	1.95											
28 x 25*			1.15	1.33	1.49	1.58	1.80		2.09											
30 x 15	0.661	0.783	0.959	1.13	1.23															
30 x 20	0.740	0.877	1.08	1.27	1.39															
30 x 30	0.897	1.07	1.31	1.55	1.70															
35 x 15	0.740	0.877	1.08	1.13	1.39															
40 x 20	0.897	1.07	1.31	1.55	1.70		2.07													
40 x 25		1.16	1.43	1.69	1.86	2.00	2.27	2.45	2.66	2.81	3.02									
40 x 28			1.50	1.78	1.95	2.13	2.39	2.64	2.80	2.96	3.19									
40 x 40		1.44	1.78	2.12	2.33	2.51	2.85	3.11	3.36	3.49	3.85	4.03	4.30	4.36	4.61					
50 x 20		1.25	1.55	1.83	2.02	2.20	2.47													
50 x 25*		1.35	1.67	1.97	2.17	2.37	2.66	2.94	3.13	3.31	3.57									
50 x 30							2.86	3.11	3.36	3.49	3.85	4.03	4.30	4.36	4.61					
50 x 50					2.96	3.24	3.64	3.99	4.31	4.50	4.94	5.22	5.56	5.68	6.02					
60 x 40			2.02	2.40	2.65	2.89	3.25	3.60	3.83	4.06	4.40	4.72	4.93							
60 x 60					2.96	3.24	3.64	3.99	4.31	4.50	4.94	5.22	5.56	5.68	6.02					
80 x 60					3.59	3.93	4.43	4.87	5.25	5.50	6.04	6.41	6.82							
100 x 100					3.59	3.93	4.43	4.87	5.25	5.50	6.04	6.41	6.82							
120 x 80							5.17	5.75	6.13	6.50	7.14	7.61	8.07	8.32	8.85					
120 x 120									7.07	7.51	8.16	8.80	9.22	9.64	10.26	11.27				
140 x 100									8.96	9.52	10.36	11.19	11.73	12.28	13.08	14.41				
150 x 100									8.01	8.51	9.26	9.99	10.48	10.96	11.67	12.84				
160 x 80									8.96	9.52	10.36	11.19	11.73	12.28	13.08	14.41				
180 x 180									10.84	11.53	12.56	13.57	14.25	14.91	15.91	17.55				
200 x 160									8.96	9.52	10.36	11.19	11.73	12.28	13.08	14.41				
200 x 200									10.84	11.53	12.56	13.57	14.25	14.91	15.91	17.55				
250 x 150									11.31	12.03	13.10	14.17	14.87	15.57	16.62	18.33				
240 x 160									10.84	11.53	12.56	13.57	14.25	14.91	15.91	17.55				
350 x 250																	36.70	41.48	46.14	50.68
																	36.70	41.48	46.14	50.68
																	41.10	46.51	51.79	56.96
																	41.10	46.51	51.79	56.96
																	41.10	46.51	51.79	56.96
																	63.08	71.63	80.05	88.36

Welded water and gas line pipes as per GOST 3262-75

Nominal bore	Outside diameter, mm	Wall thickness, mm													
		1.8	2.0	2.2	2.35	2.50	2.8	3.0	3.2	3.5	4.0	4.5	5.0	5.5	
		Weight per meter length, kg													
6	10.2	0.37	0.40			0.47									
8	13.5		0.57	0.61			0.74								
10	16.0		0.69												
10	17.0		0.74	0.80			0.98								
15	20.0					1.08									
15	21.3				1.10	1.16	1.28	1.35	1.43						
20	26.0					1.45									
20	26.8				1.42	1.50	1.66	1.76	1.86						
25	32.0						2.02								
25	33.5					1.91	2.12	2.26	2.39	2.59	2.91				
32	41.0						2.64								
32	42.3					2.45	2.73	2.91	3.09	3.35	3.78				
40	47.0							3.26							
40	48.0					2.74	3.05	3.33	3.46	3.84	4.34				
50	59.0							4.14							
50	60.0					3.48	3.88	4.22	4.40	4.88	5.43	6.16			
65	74.0								5.59						
65	75.5								5.71	6.21	7.05	7.88			
80	88.5									7.34	8.34	9.32			
90	101.3									8.44	9.60	10.74			
100	114.0										10.85	12.15	13.44		
125	140.0										13.42	15.04	13.44	18.24	
150	165.0										15.88	17.81		21.63	

- Light. standard and extra strong.
- At the customer's request.

Standard galvanized welded pipes range

Outside diameter, mm	Wall thickness, mm											
	2.0	2.2	2.5	2.8	3.0	3.2	3.5	3.8	4.0	4.5	5.0	6.0
	Weight per meter length, kg											
33			1.94	2.15	2.29							
33.7			1.98	2.19	2.34							
35				2.18								
38	1.83		2.25									
40	1.93		2.38	2.65	2.82							
42			2.51	2.79	2.98							
43				2.81								
45	2.18		2.70									
48			2.89	3.21	3.43	3.65	3.96		4.47			
51	2.49		3.08		3.66							
57	2.79		3.46	3.85	4.11	4.38	4.76		5.39	6.00		
60	2.95		3.66	4.07	4.35	4.61	5.03	5.43	5.69			
63.5	3.12		3.87		4.61		5.34		6.05			
73*			4.48	5.00	5.34	5.68	6.18	6.67	7.01			
76	3.76	4.12	4.67	5.20	5.56	5.92	6.45	6.97	7.31	8.17	9.01	
80	3.97	4.35		5.49	5.87							
89	4.42		5.49	6.13	6.55	6.97	7.60	8.22	8.63	9.66	10.67	
90									8.73			
102	5.08	5.57	6.31	7.06	7.54	8.03	8.76	9.48	9.96	11.14	12.32	14.64
108			6.70	7.48	8.00	8.52	9.29	10.05	10.57	11.83	13.08	15.54
114			7.08	7.91	8.46	9.00	9.82	10.64	11.18	12.51	13.84	16.46
127					9.46		10.98		12.49	14.01	15.49	18.44
133			8.29	9.26	9.91	10.55	11.52	12.47	13.11	14.69	16.25	
146					10.90		12.67		14.43	16.18	17.91	21.34
152					11.35	12.09			15.04			22.25
159			9.94	11.11	11.89	12.67	13.82	14.96	15.75	17.66	19.56	23.32

Mechanical properties of welded pipes as per GOST 10705-80

Steel grade	Ultimate tensile strength σ_u , N/mm ² (kgf/mm ²) for pipes outside diameter D, mm					Yield strength, σ_y , N/mm ² (kgf/mm ²)		Elongation δ_s , % for pipes outside diameter D, mm					
	8-19	20 to 60 for wall thickness		63-152	159-245			8-19	20 to 60 for wall thickness		63-152	159-245	
		greater than 0.06 D	0.06 D or less			greater than 0.06 D	0.06 D or less		greater than 0.06 D	0.06 D or less			
08Yu	314 (32)	314 (32)	294 (30)	—	—	174 (18)	—	7	7	16	—	—	—
08PS.08KP	372 (38)	372 (38)	314 (32)	294 (30)	314 (32)	174 (18)	196 (20)	6	6	15	23	15	18
08	372 (38)	372 (38)	314 (32)	294 (30)	314 (32)	186 (19)	196(20)	6	6	15	23	15	18
10KP. ST2KP	372 (38)	372 (38)	333 (34)	314 (32)	314 (32)	174 (18)	196(20)	6	6	15	23	15	18
10PS	372 (38)	372 (38)	333 (34)	314 (32)	314 (32)	186 (19)	196(20)	6	6	15	23	15	18
St2ps	372 (38)	372 (38)	333 (34)	314 (32)	333 (34)	186 (19)	206 (21)	6	6	15	23	15	17
10	372 (38)	372 (38)	333 (34)	314 (32)	314 (32)	196 (20)	196(20)	6	6	15	23	15	18
St2sp	372 (38)	372 (38)	333 (34)	314 (32)	333 (34)	196 (20)	206 (21)	6	6	15	23	14	17
15	441 (45)	441 (45)	372 (38)	353 (36)	353 (36)	206 (21)	216 (22)	5	5	14	21	14	17
20	441 (45)	441 (45)	372 (38)	353 (36)	353 (36)	216 (22)	216 (22)	5	5	14	21	14	17
St3kp	441 (45)	441 (45)	392 (40)	372 (38)	353 (36)	196 (20)	216 (22)	5	5	13	20	14	17
St3ps	441 (45)	441 (45)	392 (40)	372 (38)	353 (36)	206 (21)	216 (22)	5	5	13	20	14	17
St3sp	441 (45)	441 (45)	392 (40)	372 (38)	353 (36)	216 (22)	216 (22)	5	5	13	20	14	17

PRECISION PIPES

Pipes for the manufacture of machine parts in the automotive, drilling, oil production, mining, crane, and other industries, including the manufacture of electric submersible pump housings, hydraulic cylinders, shock absorbers, as well as cardan shafts

MANUFACTURERS

VTZ, SinTZ, TMK-INOX, PNTZ, CHTPZ

FEATURES

Precision steel pipes are manufactured with higher accuracy. Pipes are produced by hot or cold rolling (on cold pilgers), or by drawing (with or without a plug). Pipes meet different requirements for dimensions, steel grades, manufacturing tolerances, mechanical properties, and surface quality, depending on the production technique and the requirements of applicable standards.

Pipes are made of carbon, alloy and stainless steels to Russian and foreign standards as well as to manufacturer’s specifications designed to meet the technical requirements of specific customers.

Mandatory tests and examinations are performed in full compliance with applicable standards.

Pipes can be made to customer specifications for dimensions and tolerances, including improved precision of wall thickness (+/-6%) and outside diameter (+/-0.5%), as well as extremely thick-walled pipes with a D/S ratio of up to 2.2 mm and a wall thickness of up to 67 mm. Isothermal annealing and outside surface machining services are available.

Random length pipes are manufactured with lengths between 1.5 m and 12.5 m; cut length pipes – between 4.5 mm and 9 m. Cut length pipes may be produced with a length of more than 12.5 m by agreement between the parties.

TMK-INOX produces high-tech cold-formed pipes made of stainless steels and alloys with controlled nanostructure and improved properties to meet the current and future requirements of various industries. Available equipment can produce pipes with diameters from 1.5 mm to 102 mm, wall thickness from 0.12 mm to 10 mm and length up to 30 m. The plant can produce pipes with a high quality of inner and outer surfaces, including electrochemical polishing.

SPECIAL CAPABILITIES

- cold-formed pipe diameter range: 0.8 mm–426 mm; wall thickness: 0.16 mm–24.0 mm
- manufacture of pipes with non-standard dimensions and tolerances
- outer surface grinding
- pipe heat treatment in furnaces with oxidizing or non-oxidizing atmospheres
- manufacture of capillary tubes
- nondestructive testing, hydraulic and pneumatic testing of pipes
- protective coating of pipes.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
DIN EN 10305-1 Steel tubes for precision applications. Technical delivery conditions. Seamless cold drawn tubes	6.0-110.0	0.5-10.0	E235; E355; C45E
	95-300	7.5-25	
DIN 2391 Seamless precision steel tubes	32-100*	2.5-8.0	St 35; St 45; St 52.0; St 52.3
DIN 2393-94 Welded precision steel tubes (cold-formed) (DIN EN 10305-2 Steel tubes for precision applications)	By agreement with the customer		RSt 34-2; RSt 37-2; St 44-2
DIN 2394 As-welded and sized precision steel tubes	12-63.5	0.8-3.0	RSt 34-2; RSt 37-2; St 44-2; E195; E235; E275; E355
EN 10305-3 Steel tubes for precision applications. Welded cold sized tubes	15x15-60x40	1.0-3.0	RSt 34-2; RSt 37-2; St 44-2
DIN 2395, part 1, 2 Rectangular and square welded precision steel tubes (for general use) EN 10305-5 Steel tubes for precision applications. Technical delivery conditions. Welded cold sized square and rectangular tubes			
GOST 9567-75 Precision steel tubes	5.0-80.0 70-203	0.5-10.0 9-50	10; 20; 35; 45; 15KhM; 30KhGSA; 10G2; etc.
	5.0-426	0.8-40	
TU 14-159-263-2006 (TU 14-159-292-2005) Cold-formed electric-welded precision steel pipes for the automotive industry	16-58	1.0-2.5	10; 10ps; 10kp; 20; 08; 08kp; 08ps; 09G2S
1	2	3	4

STAINLESS STEEL PIPES

Corrosion-resistant pipes are used in the machine building, chemical, oil refining, and food industries

MANUFACTURERS

VTZ, TMK-INOX, CHTPZ, TMK-PS

FEATURES

Hot-formed stainless steel pipes are produced at Volzhsky Pipe Plant by extrusion. Two extrusion lines with 2,000-tonne and 5,500-tonne extruders have no analogues in Russia and can manufacture pipes with diameters from 42 mm to 273 mm, wall thicknesses from 3.5 mm to 30 mm and lengths from 2 m to 12.5 m, with a high quality of inner and outer surfaces. The mechanical properties of produced pipes are close to those of cold-formed pipes and have improved performance characteristics compared to rolled pipes. The employed production method allows making pipes of steel grades, that are hardly formable, such as 06KhN28MDT, 10KhN28MDT, 10Kh17N13M2T, 15Kh25T, 20-30Kh13, as well as 10Kh23N18 creep resistant steel grades and 08Kh22N6T duplex steel grades.

TMK-INOX produces high-tech cold-formed pipes made of stainless steels and alloys with controlled nanostructure and improved properties to meet current and future requirements of various industries. Available equipment can produce pipes with diameters from 1.5 mm to 114 mm, wall thicknesses from 0.12 mm to 10 mm and lengths up to 32.5 m. The plant can produce pipes with a high quality of inner and outer surfaces, including electrochemical polishing.

Hot-formed stainless steel pipes are produced at Chelyabinsk Pipe Plant on pilger mills. These mills are unique in that they can produce pipes with a diameter up to 630 mm. Pipes are supplied after machining to ensure high surface quality.

Cold-formed stainless steel pipes are produced at Chelyabinsk Pipe Plant on cold pilgers. These mills can produce pipes with diameters from 90 mm to 426 mm and wall thicknesses from 2 mm to 40 mm. CHTPZ is the only manufacturer of cold-formed pipes with diameters over 120 mm in Russia and other CIS countries.

Large-diameter stainless steel electric-welded pipes are manufactured at TMK PS (Chelyabinsk) from rolled sheets; the equipment allows the production of pipes with a diameter from 377 mm to 1620 mm with wall thicknesses from 6.0 mm to 50.0 mm.

Before shipment to the customer, pipes undergo finishing and quality control at the manufacturer’s facilities.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
ASTM A 312/A 312M Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes	5.0-219.1	0.4-28	TP304; TP304L; TP316; TP316L; TP316Ti; TP321; TP 304H; TP 347; TP 347H
DIN EN 10216-5 (DIN 17458) Seamless steel tubes for pressure purposes. Technical delivery conditions. Stainless steel tubes	5.0-219.1 42-273	0.5-28 4-30	1.4501; 1.4307; 1.4571; 1.4401; 1.4404; 1.4306; 1.4435; X6CrNiTi181
GOST 9940-81 Seamless hot formed tubes made of corrosion resistant steel	42-273	3-36	08-40Kh13; 08-12Kh18N10T; 08-10Kh17N13M2T; 10-20Kh23N18; 06Kh28MDT; 08Kh22N6T; 08-12Kh17; 15Kh25T; 08Kh17N15M3T; 03Kh17N14M3 and other grades by agreement
GOST 9941-2022 Seamless cold- and warm-formed tubes of corrosion-resistant steel	5-426	0.2-40	08Kh13; 12Kh13; 20Kh13; 12Kh17; 12Kh17T; 08-12Kh18N10T; 10Kh17N13M2T; 06KhN28MDT; 10Kh23 N 18; 08Kh2 2 N6T
GOST 10498-82 Especially thin-walled seamless tubes of corrosion-resistant steel	4-75	0.2-1.0	06Kh18NYuT; 08Kh18NYuT; 09Kh18NYuT
GOST 14162-79 Steel tubes of small dimensions (capillary)	2-6	0.2-1.6	12Kh18N9; 08Kh18N1 OT; 12Kh18N10T; 08Kh18N12T; 12Kh18N12T; KhN78T
GOST 19277-73 Seamless steel tubes for oil and fuel lines	4-70	0.5-3.0	12Kh18N10T; 08Kh18N10T; 08Kh18N10T-VD; 12Kh18N10T-VD
GOST 22897-2023 Seamless cold-formed pipes from alloys based on titanium	6-89	0.5-8	VT1-0; PT-1M; PT-7M
TU 24.20.21-022-57357928-2024 Longitudinal electric-welded pipes made of high-alloyed corrosion-resistant steel grades	377-1620	6.0-50.0	03Kh18N11; 04Kh18N10; 08 Kh18N10;08Kh18N10T; 08Kh18N12T; 08Kh18N125;12Kh18N9; 12Kh18N9T; 12Kh18N10T;12Kh18N12T; 03Kh17Sh4M3; 08Kh17N13M2T; 08Kh17N15M3T; 10Kh17N13M2T; 20Kh23N13; 10Kh; 10Kh17N13M2T; 20Kh23N13; 10Kh23N18; 20Kh23N18; 03Kh22N5AM3; 03Kh22N6M2; 08Kh22N6T; 08Kh21N6M2T; 05KhN32T (KhN32T); 06KhN28MDT; AISI 304; 304N; 304L; 304LN; 304H; 309S; 310S; 316; 316N; 316L; 316LN; 316H; 316Ti; 317; 321; 321H; 347; 347H; 904L; 800; 318
1	2	3	4

Range of hot-finished stainless steel pipes

Outside diameter, mm	Wall thickness, mm																											
	3.5	4	4.5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	25	28	30					
	Weight per meter length, kg																											
42	3.34	3.77	4.19	4.59	5.36	6.08	6.75	7.37	7.94	8.46																		
45	3.60	4.07	4.52	4.96	5.81	6.60	7.35	8.04	8.69	9.28	9.83																	
48	3.87	4.37	4.86	5.34	6.25	7.12	7.94	8.71	9.43	10.10	10.72	11.29	11.81															
50	4.04	4.57	5.08	5.58	6.55	7.47	8.34	9.16	9.93	10.65	11.32	11.94	12.51	13.03														
53	4.30	4.86	5.42	5.96	7.00	7.99	8.93	9.83	10.67	11.47	12.21	12.91	13.55	14.15	14.69													
54	4.39	4.96	5.53	6.08	7.15	8.17	9.13	10.05	10.92	11.74	12.51	13.23	13.90	14.52	15.09													
57	4.65	5.26	5.86	6.45	7.59	8.69	9.73	10.72	11.66	12.56	13.40	14.20	14.94	15.64	16.28													
60	4.91	5.56	6.20	6.83	8.04	9.21	10.32	11.39	12.41	13.38	14.30	15.16	15.98	16.75	17.47													
68	5.60	6.35	7.09	7.82	9.23	10.60	11.91	13.18	14.39	15.56	16.68	17.75	18.76	19.73	20.65	21.52	22.34	23.11	23.83									
73	6.04	6.85	7.65	8.44	9.98	11.47	12.91	14.30	15.64	16.93	18.17	19.36	20.50	21.59	22.63	23.63	24.57	25.46										
76	6.30	7.15	7.99	8.81	10.42	11.99	13.50	14.97	16.38	17.75	19.06	20.33	21.54	22.71	23.83	24.89	25.91											
83	6.91	7.84	8.77	9.68	11.47	13.20	14.89	16.53	18.12	19.66	21.15	22.58	23.97	25.31	26.61	27.85												
89	7.43	8.44	9.44	10.42	12.36	14.25	16.08	17.87	19.61	21.29	22.93	24.52	26.06	27.55	28.99	30.38	31.72	33.01	34.25									
95		9.03	10.11	11.17	13.25	15.29	17.27	19.21	21.10	22.93	24.72	26.46	28.14	29.78	31.37	32.91												
102		9.73	10.89	12.04	14.30	16.50	18.66	20.77	22.83	24.84	26.80	28.72	30.58	32.39	34.15	35.86	37.53	39.14	40.70	43.68								
108		10.32	11.56	12.78	15.19	17.55	19.85	22.11	24.32	26.48	28.59	30.65	32.66	34.62	36.53	38.39	40.21	41.97	43.68	46.96								
114				13.53	16.08	18.59	21.05	23.45	25.81	28.12	30.38	32.59	34.75	36.86	38.92	40.93	42.89	44.80	46.66	50.23	55.22							
121				14.39	17.12	19.81	22.44	25.02	27.55	30.03	32.46	34.85	37.18	39.46	41.70	43.88	46.01	48.10	50.13	54.05	59.56	64.63						
127					18.02	20.85	23.63	26.36	29.04	31.67	34.25	36.78	39.26	41.70	44.08	46.41	48.69	50.93	53.11	57.33	63.29	68.80						
133			14.35	15.88	18.91	21.89	24.82	27.70	30.53	33.31	36.04	38.72	41.35	43.93	46.46	48.94	51.37	53.76	56.09	60.61	67.01	72.97						
140					19.95	23.11	26.21	29.26	32.26	35.22	38.12	40.98	43.78	46.53	49.24	51.90	54.50	57.06	59.56	64.43	71.35	77.83						
146					20.85	24.15	27.40	30.60	33.75	36.86	39.91	42.91	45.86	48.77	51.62	54.43	57.18	59.89	62.54	67.71	75.08	82.00						
152					21.74	25.19	28.59	31.94	35.24	38.49	41.70	44.85	47.95	51.00	54.01	56.96	59.86	62.72	65.52	70.98	78.80	86.17	90.84					
159			17.26	19.11	22.78	26.41	29.98	33.51	36.98	40.40	43.78	47.11	50.38	53.61	56.78	59.91	62.99	66.02	69.00	74.80	83.14	91.03						
168					24.12	27.97	31.77	35.52	39.21	42.86	46.46	50.01	53.51	56.96	60.36	63.71	67.01	70.26	73.46	79.72	88.73	97.29	102.75					
180						34.15	38.20	42.19	46.14	50.03	53.88	57.68	61.43	65.12	68.77	72.37	75.92	79.42	86.27	96.17	105.63	111.68						
194						36.93	41.32	45.67	49.96	54.20	58.40	62.54	66.64	70.68	74.68	78.63	82.52	86.37	93.91	104.86	115.36							
219						36.83	41.89	46.91	51.87	56.78	61.65	66.46	71.23	75.94	80.61	85.23	89.79	94.31	98.78	107.56	120.37	132.73						
245							52.71	58.32	63.88	69.39	74.85	80.26	85.62	90.94	96.20	101.41	106.57	111.68	121.76	136.50	150.80							
273							52.62	58.97	65.27	71.53	77.73	83.89	89.99	96.05	102.05	108.01	113.92	119.77	125.58									

Pipes can be ordered to dimensions not specified in the table.
* Pipes is delivered under an additional technical agreement. The table shows weight per meter length of pipes made of 08Kh18N10T steel.

Mechanical properties of seamless standard pipes as per GOST 9940-81, GOST 9941-81

Steel grade	Ultimate tensile strength σ_r , kgf/mm ² (N/mm ²)		Elongation δ_5 , %		Density, ρ , g/cm ³	
	Hot-formed	Cold-formed	Hot-formed	Cold-formed	Hot-formed	Cold-formed
08Kh13	372 (38)	372 (38)	22	22	7.70	7.70
08Kh17T	372 (38)	372 (38)	17	17	7.70	7.70
12Kh13	392 (40)	392 (40)	21	22	7.70	7.70
12Kh17	441 (45)	441 (45)	17	17	7.70	7.70
15Kh25T	441 (45)	461 (47)	17	17	7.60	7.60
04Kh18N10	441 (45)	490 (50)	40	45	7.90	7.90
10Kh23N18	491 (50)	529 (54)	37	35	7.95	7.95
08Kh17N15M3T	510 (52)	549 (56)	35	35	8.10	8.10
08Kh18N10	510 (52)	529 (54)	40	37	7.90	7.90
08Kh18N10T	510 (52)	529 (56)	40	37	7.90	7.90
08Kh18N10T	510 (52)	549 (56)	38	37	7.90	7.90
08Kh18N12B	510 (52)	529 (54)	40	37	7.90	7.90
08Kh18N12T	510 (52)	549 (56)	40	37	8.10	7.95
08Kh20N14C2	510 (52)	510 (52)	35	35	7.70	7.70
10Kh17N13M2T	529 (54)	529 (54)	35	35	8.00	8.00
12Kh18N9	529 (54)	549 (56)	40	37	7.90	7.90
12Kh18N10T	529 (54)	549 (56)	40	35	7.90	7.95
12Kh18N12T	529 (54)	549 (56)	40	35	7.95	7.90
17Kh18N9	568 (58)	568 (58)	40	35	7.90	7.90
08Kh22N6T	588 (60)	588 (60)	24	20	7.70	7.60
08KhN28MDT	490 (50)	490 (50)	30	30	7.96	7.96

PETROLEUM CRACKING PIPES

This type of pipes is used in petroleum cracking and chemical synthesis units

MANUFACTURERS

VTZ, SinTZ, TAGMET, CHTPZ, PNTZ

FEATURES

Cold-formed pipe petroleum cracking pipes are produced at Sinarsky Pipe Plant (SinTZ) from billets supplied from steel mills or from semi-finished hot-extruded pipes produced by Volzhsky Pipe Plant.

Hot-formed petroleum cracking pipes are produced at Volzhsky and Sinarsky Pipe Plants from billets supplied from steel mills or from continuous cast billets made by the Company.

Cracking pipe length varies from 4 m to 12.1 m. In agreement with the customer, petroleum cracking pipes can be manufactured with lengths over 12.1 meters.

Volzhsky Pipe Plant makes pipes by hot extrusion. Research identified the following advantages of this method over conventional hot rolling*:

- pressure loss per unit of nominal length in pipeline made from extruded pipes is 40% less than in pipeline made from rolled pipes
- pipes made by hot extrusion have higher average strength (by 5%–7%) and ductility (by 10%–14%) than rolled pipes, the probability of extruded pipe failure is five times less than in case of rolled pipes.

Hot-formed petroleum cracking pipes are produced at Chelyabinsk Pipe Plant in pilger mills from forged billets. These mills are unique in that they can extruded pipe with a diameter up to 550 mm.

Standards

Standards	Pipes dimensions		Steel grade	Pipes type
	Outside diameter, mm	Wall thickness, mm		
GOST 550-2020 Seamless steel tubes for petroleum processing and petrochemical industry	10-108	1.5-12.0	10; 10G2; 20; 15Kh5M; 12Kh8; 09G2S	cold-finished
	32-168 273-426	2.8-16.0 7.0-18.0	10; 20 10G2; 13Kh9M1	hot-finished
	38-245	4.0-32.0	10; 20; 10G2;12KhM; 12Kh8; 15Kh5M; 13Kh9M1	hot-finished
TU 14-3R-62-2001 Seamless hot-formed pipes made of 15Kh5M steel for the oil refining industry	273-426	10-36	15Kh5M	hot-finished
	550	25		

Range of cold-finished petroleum cracking pipes

Outside diameter, mm	Wall thickness, mm										
	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5	5,5	6
	Weight per meter length, kg										
16			0.69								
19		0.65	0.84								
20	0.47		0.89	1.08							
25			1.13	1.39	1.63		2.07	2.28			
28			1.28	1.57					2.84		
32										3.59	3.85
38			1.78	2.19	2.59	2.98					
48							4.34	4.83			

* Based on the results of tests conducted by TMK Group.

Range of seamless hot-finished petroleum cracking pipes

Outside diameter, mm	Wall thickness, mm																								
	2.8	3.0	3.2	3.5	4.0	4.5	5	6	7	8	9	10	11	12	14	15	16	17	18	20	22	23	25	28	30
	Weight per meter length, kg																								
32	–	–	–	–	–	–																			
33.7	–	–	–	–	–	–																			
38	–	–	–	–	–	–	–																		
42	–	–	–	–	3.75	4.16	4.56	5.33	6.04	6.71	7.32	7.89	8.41	8.88	9.67										
42.4	–	–	–	–	–																				
45		–	–	–	4.04	4.49	4.93	5.77	6.56	7.30	7.99	8.63	9.22	9.77	10.70										
48.3		–	–	–	4.34	4.83	5.30	6.21	7.08	7.89	8.66	9.37	10.04	10.65	11.74										
50		–	–	–	4.54	5.05	5.55	6.51	7.42	8.29	9.10	9.86	10.58	11.24	12.43	12.95									
54			–	–	4.93	5.49	6.04	7.10	8.11	9.08	9.99	10.85	11.67	12.43	13.81	14.43	14.99	15.51							
57					5.23	5.83	6.41	7.55	8.63	9.67	10.65	11.59	12.48	13.32	14.85	15.54	16.18	16.77	17.31						
60			–	–	5.52	6.16	6.78	7.99	9.15	10.26	11.32	12.33	13.29	14.20	15.88	16.65	17.36	18.03	18.64	19.73					
60.3			–	–	–																				
63.5				–	5.87	6.55	7.21	8.51	9.75	10.95	12.10	13.19	14.24	15.24	17.09	17.94	18.74	19.49	20.20	21.45					
68				–	–	7.05	7.77	9.17	10.53	11.84	13.09	14.30	15.46	16.57	18.64	19.61	20.52	21.38	22.19	23.67					
70			–	–	–	7.27	8.01	9.47	10.88	12.23	13.54	14.80	16.00	17.16	19.33	20.35	21.31	22.22	23.08	24.66					
73				–	–	7.60	8.38	9.91	11.39	12.82	14.20	15.54	16.82	18.05	20.37	21.46	22.49	23.18	24.41	26.14					
76				–	–	7.93	8.75	10.36	11.91	13.42	14.87	16.28	17.63	18.94	21.40	22.57	23.67	24.74	25.75	27.62					
83					–	8.71	9.62	11.39	13.12	14.80	16.42	18.00	19.53	21.01	23.82	25.16	26.44	27.66	28.85	31.07					
89				–	–	9.38	10.36	12.28	14.15	15.98	17.76	19.48	21.16	22.79	25.89	27.37	28.80	30.19	31.52	34.03	35.21				
95							11.10	13.17	15.19	17.16	19.09	20.96	22.79	24.56	27.96	29.59	31.17	32.70	34.18	36.99					
102							11.96	14.20	16.40	18.54	20.64	22.69	24.68	26.63	30.38	32.18	33.93	35.64	37.29	40.44	41.95	43.40	47.47	51.10	53.27
108							12.70	15.09	17.43	19.73	21.97	24.17	26.31	28.41	32.45	34.40	36.30	38.15	39.95	43.40	45.05	46.66	51.17	55.24	57.70
114							13.44	15.98	18.47	20.91	23.30	25.65	27.94	30.18	34.52	36.62	38.67	40.67	42.61	46.36	48.16	49.91	54.87	59.38	62.14
121							14.30	17.02	19.68	22.29	24.86	27.37	29.84	32.26	36.94	39.21	41.43	43.60	45.72	49.81	51.79	53.71	59.18	64.21	67.32
127							15.04	17.90	20.71	23.48	26.19	28.85	31.47	34.03	39.01	41.43	43.80	46.12	48.38	52.77	54.89	56.96	62.88	68.36	71.77
133							15.78	18.79	21.75	24.66	27.52	30.33	33.09	35.81	41.08	43.65	46.16	48.63	51.05	55.73	58.00	60.22	66.58	72.50	76.20
140							–	19.83	22.96	26.04	29.07	32.06	34.99	37.88	43.50	46.24	48.93	51.57	54.15	59.18	61.63	64.02	70.90	77.33	81.38
146							–	20.71	23.99	27.22	30/41	33.54	36.62	39.65	45.57	48.46	51.29	54.08	56.82	62.14	64.73	67.27	74.60	81.48	85.82
152							–	21.60	25.03	28.41	31.74	35.02	38.25	41.43	47.64	50.68	53.66	56.60	59.48	65.10	67.84	70.53	78.30	85.62	90.26
159							–	22.64	26.24	29.79	33.29	36.74	40.15	43.50	50.06	53.27	56.42	59.53	62.59	68.55	71.46	74.33	82.61	90.45	95.44
168							–		27.79	31.56	35.29	38.96	42.59	46.16	53.17	56.60	59.97	63.31	66.58	72.99	76.13	79.21	88.16	96.67	102.10
180									29.87	33.93	37.95	41.92	45.84	49.71	57.31	61.04	64.71	68.34	71.91	78.91	82.34	85.72	95.56	104.95	110.98
194										36.69	41.06	45.37	49.64	53.86	62.14	66.22	70.23	74.21	78.12	85.82	89.59	93.31	104.19	114.62	121.34
203										38.47	43.06	47.59	52.08	56.52	65.25	69.55	73.78	77.98	82.12	90.26	94.25	98.20	109.74	120.83	127.99
219										36.60	41.63	46.61	51.54	56/42	61.26	70.77	75.46	80.10	84.69	89.22	98.15	102.54	106.88	119.60	131.88
245															79.76	85.08	90.36	95.59	100.76	110.97	116.00	120.98	135.63	149.83	159.07

Mechanical properties of petroleum cracking pipes

Steel grade	Ultimate tensile strength σ _u , kgf/mm ² (MN/m ²)	Yield strength, σ _s , kgf/mm ² (MN/m ²)	Elongation δ, %	Percentage reduction of area, ψ, %	Impact strength KCU, J/ cm ² (kgf/cm ²)	Hardness, HB
	min					max
COLD-FORMED						
10	34 (333)	21 (206)	26	–	–	137
20	42 (412)	25 (245)	23	–	–	156
15Kh5M	40 (392)	22 (216)	22	–	–	170
12Kh8	40 (392)	22 (216)	22	–	–	170
10G2*	43 (421)	27 (265)	21	–	–	197
HOT-FORMED						
10	36 (353)	22 (216)	25	50	78(8)	137
20	44 (431)	26 (255)	22	50	78(8)	156
10G2	43 (421)	27 (265)	21	50	118 (12)	197
12KhM	42 (412)	25 (245)	21	45	69 (7)	156
13Kh9M1	392	216	22	50	98	197
	569**	412**	16**	50**	98**	235**
15Kh5	40 (392)	22 (216)	24	50	98 (10)	170
15Kh5M	40 (392)	22 (216)	22	50	118 (12)	170
15Kh5M-U (normalization and tempering)	60 (588)	42 (412)	16	65	98 (10)	235

* For steel grade 10G2, percentage reduction of area is 50%, impact strength is 118 (12) as per GOST 550-75.

** Afternormalization and tempering if requested by customer.

PIPES FOR POWER GENERATION

Power-generation pipes are used in steam boilers and pipelines with high and supercritical steam parameters

MANUFACTURERS

VTZ, SinTZ, TAGMET,
PNTZ, CHTPZ, TMK-INOX

FEATURES

Cold-formed pipes for power generation are produced at Sinarsky Pipe Plant from billets supplied from steel mills or from semi-finished hot-extruded pipes produced by Volzhsky Pipe Plant.
Pipe length: up to 24 m.

Hot-formed pipes for power generation produced at Volzhsky and Sinarsky Pipe Plants from billets supplied from steel mills or from continuous cast billets.

Hot-formed pipes for power generation are manufactured at Volzhsky Pipe Plant by hot extrusion.

Research identified the following advantages of this method over conventional hot rolling*:

- pipes made by hot extrusion have higher average strength (by 5%–7%) and ductility (by 10%–14%) than rolled pipes, the probability of extruded pipe failure is five times less than in case of rolled pipes.

Hot-formed pipes for power generation are produced at Chelyabinsk Pipe Plant on pilger mills. These mills are unique in that they can produce pipes with a wall thickness up to 90 mm.

Cold-formed pipes for power generation are produced at Chelyabinsk Pipe Plant on cold pilgers. These mills can produce pipes with diameters from 90 mm to 426 mm and wall thicknesses from 2 mm to 40 mm. CHTPZ and PNTZ are the only manufacturer of cold-formed pipes with diameters over 120 mm in Russia and other CIS countries.

* Based on the results of tests conducted by TMK Group.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter. mm	Wall thickness. mm	
1	2	3	4
ASTM A53/A53M Standard Specification for Seamless Carbon Steel Pipes for High-Temperature Service ASTM A106/A106M Standard Specification for Pipes, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless ASME SA-53/SA-53M Specification for Pipes, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless ASME SA-106/SA-106M Standard Specification for Seamless Carbon Steel Pipes for High-Temperature Service	168.3-406.4	7.1-34.9	A; B; C
	10.3-88.9	1.73-11.13	
	10.3-73.0*	1.73-10.15	
	33.4-219.1	2.90-25.40	Gr A; Gr B; Gr C
ASTM A106/A106M Standard Specification for Seamless Carbon Steel Pipes for High-Temperature Service	10.3-127	1.73-12.7	A-1; C
	10.3-73.0**	1.73-10.15	Gr A; Gr B; Gr C
	33.4-219.1	2.90-25.40	
	60.3-406.4	4-34.9	A-1; C
ASTM A192/A192M Standard Specification for Seamless Carbon Steel Boiler Tubes for High-Pressure Service ASME SA-192/SA-192M Seamless Carbon Steel Boiler Tubes for High-Pressure Service. Specifications	19.05-76.2	2.11-5.0	Low carbon
	19.05*	2.11	
ASTM A335/A335M Seamless Ferritic Alloy-Steel Pipes for High-Temperature Service	26.7-406.4	2.11-25.4	P5; P9; P11; P12; T11; T12; P22; P91; etc.
	219.1	8.18-27.79	
ASTM A 213/A213M Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes Specifications ASME SA-213/SA-213M Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes	26.7-60.3	2.11-5.54	T5
	48-127; 141.3	4-12.7	
	31.75**	6.1-6.6	T22
DIN EN 10216-1 Seamless steel tubes for pressure purposes. Technical delivery conditions. Non-alloy steel tubes with specified room temperature properties	10.2-168.3	1.6-16	P235TR1; P235TR2; 34CrMo4 to DIN EN 10297-1 (up to 76.1 mm)
	10.2-88.9**	1.8-7.1	P195TR1; P195TR2; P235TR1 P235TR2; P265TR1; P265TR2
	32-219	2.9-45.0	
	38.0-426.0	6-32	P235TR1; P235TR2; 34CrMo4 to DIN EN 10297-1 (up to 76.1 mm)
DIN EN 10216-2 (DIN 17175) Seamless steel tubes for pressure purposes. Technical delivery conditions. Non-alloy and alloy steel tubes with specified elevated temperature properties	13.5-88.9**	1.8-12.0	P235GH; 16Mo3; 13CrMo4-5; 10CrMo9-10
	21.3-245.9	2.9-55.0	P195GH; P235GH; P265GH; 16MoZ; 13CrMo4-5
DIN EN 10216-3 Seamless steel tubes for pressure purposes. Technical delivery conditions. Alloy fine grain steel tubes	33.7-168.3	2.9-16	P355N; P355NH
	32.0-219.1	2.9-40.0	P355N
GOST 33229-2015 Tubes for boiler and heat exchanging equipment. Technical specifications. Part 1. Seamless steel pipes to work under pressure not more than 6,4 MPa and at temperatures not exceeding 400°C	6-168	0.8-16	10; 20; 09G2S; 10G2
	10-180**	2.5-12.0	10; 20; 09G2S; 10G2
TU 14-ZR-55-2001 Seamless steel pipes for steam boilers and pipelines	10-550	2.0-90	20; 15GS; 20PV; 15KhM; 12Kh1MF-PV; 12Kh18N12T; 15Kh1M1F; 12Kh1MF; 12Kh2MFSR; 12Kh1MF-Sh; 10Kh9MFB; 10Kh9MFB-Sh; 10Kh9V2MFBR-Sh; 12Kh11V2MF; 08Kh16N9M2; 10Kh13G12BS2N2D2
1	2	3	4

* Dimensions of pipes for power generation to TU 14-3-190-2004 comply with GOST 8732-78 and GOST 8734-75.

** Pipes are manufactured in a cold-formed condition.

Mechanical properties

Steel grade	Yield strength, σ _{0.2} ^a kgf/mm ² (MN/m ²)			Long-term strength, N/mm ² (kgf/mm ²)									
	at a test temperature of, °C			at a test temperature of, °C and a test time of, h									
	250	400	450	450		500		550		600		650	
				10 ⁵ h	2x10 ⁵ h	10 ⁵ h	2x10 ⁵ h	10 ⁵ h	2x10 ⁵ h	10 ⁵ h	2x10 ⁵ h	10 ⁵ h	2x10 ⁵ h
20	196 (20)	137 (14)	127 (13)	78 (8.0)	56 (5.7)	38 (3.9)	—	—	—	—	—	—	—
15GS	245 (25)	167 (17)	127 (13)	98 (10.0)	56 (5.7)	—	—	—	—	—	—	—	—
15KhM	225 (23)	196 (20)	191 (19.5)	—	—	127 (13.0)	118 (11.5)	51 (5.2)	38 (3.9)	—	—	—	—
12Kh1MF	—	216 (22)	206 (21)	—	—	167 (17.0)	135 (13.8)	97 (9.9)	82 (8.4)	55 (5.6)	45 (4.6)	—	—
15Kh1M1F	—	235 (24)	225 (23)	—	—	176 (18.0)	147 (15.0)	104 (10.6)	93 (9.5)	63 (6.4)	56 (5.7)	—	—
12Kh18N12T	—	—	—	—	—	—	—	147 (15.0)	135 (13.8)	108 (11.0)	90 (9.9)	69 (7.0)	61 (6.2)
16Mo3	205 (20.5)	160 (16)	155 (15.5)	245 (24.5)	228 (22.8)	93 (9.3)	75 (7.5)	31 (3.1)	25 (2.5)	—	—	—	—
13CrMo41-5	230 (23)	190 (19)	180 (18)	285 (28.5)	260 (26)	137 (13.7)	115 (11.5)	49 (4.9)	39 (3.9)	—	—	—	—
St 35.8	160* (16)	110 (11)	105 (10.5)	69 (7)	57 (5.7)	—	—	—	—	—	—	—	—
St 45.8	180 (18)	130 (13)	125 (12.5)	69 (7)	57 (5.7)	—	—	—	—	—	—	—	—

* These values are guaranteed.

Mechanical properties of power-generation pipes metal

Steel grade	Test piece orientation	Ultimate tensile strength σ _{b,2} , MN/mm ² (kgf/mm ²)	Yield strength σ _{0.2} , MN/mm ² (kgf/mm ²)	Elongation δ, %	Percentage reduction of area, ψ, %	Hardness, HB	Impact strength KCU, J/cm ² (kgf/cm ²)
		min					
20	longitudinal	412-549 (42-56)	216 (22)	24	45	—	49 (5)
	transverse	412-549 (42-56)	216 (22)	22	40	—	39 (4)
15GS	longitudinal	at least 490 (50)	294 (30)	18	45	—	59 (6)
	transverse	at least 490 (50)	294 (30)	16	40	—	49 (5)
15KhM	longitudinal	441-637 (45-65)	235 (24)	21	50	—	59 (6)
	transverse	441-637 (45-65)	225 (23)	20	45	—	49 (5)
12Kh1MF	longitudinal	441-637 (45-65)	274 (28)	21	55	—	59 (6)
	transverse	441-637 (45-65)	274 (28)	19	50	—	49 (5)
15Kh1M1F	longitudinal	490-686 (50-70)	314 (32)	18	50	—	49 (5)
	transverse	490-686 (50-70)	314 (32)	16	45	—	39 (4)
12Kh18N12T	longitudinal	539-686 (55-70)	216-392 (22-40)	35	55	190	—
	transverse	—	—	—	—	—	—
16Mo3	longitudinal	450-600 (45-60)	260-270 (26-27)	22	—	—	—
	transverse	450-600 (45-60)	260-270 (26-27)	20	—	—	34 (3)
13CrM 041-5	longitudinal	440-590 (44-59)	280-290 (28-29)	22	—	—	—
	transverse	440-590 (44-59)	280-290 (28-29)	20	—	—	34 (3)
St 35.8	longitudinal	360-480	at least 235	25	—	—	—
	transverse	360-480	at least 235	23	—	—	34 (3)
St 45.8	longitudinal	410-530	235-25	21	—	—	—
	transverse	410-530	235-25	19	—	—	27 (3)
P235GH	longitudinal	360-500	at least 235	25	—	—	40 28
	transverse	360-500	at least 235	23	—	—	27
A	longitudinal	330	205	28	—	—	—
B	longitudinal	415	240	22	—	—	—
C	longitudinal	485	275	20	—	—	—
A-1	longitudinal	415	255	30	—	—	—
Low carbon	longitudinal	325 (47)	180 (26)	35	—	—	—

Range of seamless pipes made of carbon and alloy steel

Outside diameter, mm	Wall thickness, mm																								
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6	7	8	9	10	11	12	14	16	18	20	22	24	28	30	32	36
	Weight per meter length, kg																								
10	0.39	0.46																							
12	0.49	0.59	0.67																						
16	0.69	0.83	0.96	1.08	1.18																				
20	0.89	1.08	1.26	1.42	1.58	1.72	1.85																		
22	0.99	1.20	1.41	1.60	1.78	1.94	2.10																		
25	1.13	1.39	1.63	1.86	2.07	2.28	2.47	2.64	2.81																
28	1.28	1.57	1.85	2.11	2.37	2.61	2.84	3.05	3.26																
30	1.38	1.70	2.00	2.29	2.56	2.83	3.08	3.32	3.55																
32	1.48	1.82	2.15	2.46	2.76	3.05	3.33	3.59	3.85	4.32															
36	1.68	2.07	2.44	2.81	3.16	3.50	3.82	4.14	4.44	5.01															
38	1.78	2.19	2.59	2.98	3.35	3.72	4.07	4.41	4.74	5.35															
40		2.31	2.74	3.15	3.55	3.94	4.32	4.68	5.03																
42		2.44	2.89	3.32	3.75	4.16	4.56	4.95	5.33	6.04	6.71	7.32	7.89	8.41											
45		2.62	3.11	3.58	4.04	4.49	4.93	5.36	5.77	6.56	7.30	7.99	8.63	9.22											
50		2.93	3.48	4.01	4.54	5.05	5.55	6.04	6.51	7.42	8.29	9.10	9.86	10.58											
57					5.35	5.96	6.56	7.15	7.71	8.81	9.87	10.87	11.82	12.71	13.56	15.17	16.53	17.69							
60					5.65	6.30	6.94	7.56	8.17	9.35	10.47	11.55	12.58	13.55	14.47	16.23	17.74	19.05	20.16						
76						8.12	8.96	9.78	10.59	12.18	13.71	15.19	16.62	18.00	19.32	21.82	24.10	26.18	28.06						
83						8.92	9.84	10.75	11.65	13.42	15.12	16.78	18.39	19.94	21.44	24.29	26.93	29.37	31.59	33.82					
89							10.60	11.59	12.56	14.48	16.33	18.15	19.90	21.61	23.26	26.42	29.36	32.10	34.64	37.14	39.31				
102							12.24	13.39	14.54	16.78	18.97	21.10	23.19	25.22	27.21	31.02	34.62	38.01	41.20	44.18	47.17	52.21	54.43		
108							13.00	14.22	15.45	17.84	20.18	22.47	24.71	26.89	29.03	33.14	37.04	40.74	44.23	47.52	50.59	56.45	58.97		
114							14.40	15.06	17.11	19.76	22.35	24.89	27.37	29.79	32.16	36.72	41.06	45.16	49.04	52.69	56.12	60.68	63.50		
121							15.32	16.03	18.22	21.06	23.84	26.56	29.23	31.84	34.39	39.32	44.08	48.50	52.75	56.78	60.57	65.62	68.80	70.24	
133								20.13	23.28	26.38	29.42	32.41	35.34	38.20	41.08	45.92	50.75	55.12	59.12	63.77	68.20	73.38	78.10	83.64	89.99
140								21.24	24.58	27.87	31.09	34.26	37.38	40.43	43.37	48.08	52.75	57.57	62.83	67.86	72.66	78.10	83.64	89.99	96.67
146								22.20	25.70	29.14	32.52	35.85	39.13	42.34	45.44	50.83	55.64	60.48	66.01	71.36	76.47	82.03	87.59	94.67	102.40
152								23.15	26.81	30.41	33.96	37.44	40.88	44.25	47.44	52.34	57.18	62.03	66.99	72.03	77.24	82.64	88.24	94.03	100.13
159								24.26	28.11	31.90	35.63	39.30	42.92	46.48	49.94	54.32	58.64	63.04	67.44	71.84	76.24	80.64	85.04	90.44	96.84
168									29.78	33.80	37.77	41.69	45.54	49.34	53.12	57.61	62.03	66.44	70.84	75.24	79.64	84.04	88.44	93.84	100.24
194									34.60	39.32	43.98	48.58	53.12	57.61	62.03	66.44	70.84	75.24	79.64	84.04	88.44	93.84	98.24	103.64	110.04
219										44.62	49.94	55.21	60.41	65.56	70.64	75.64	80.54	85.34	90.14	94.94	99.74	104.54	109.34	114.14	120.54
245											47.78	56.14	62.10	67.99	73.83	79.54	85.24	90.84	96.44	102.04	107.64	113.24	118.84	124.44	131.84
273*											52.28	58.60	64.86	71.07	77.24	83.34	89.34	95.24	101.14	107.04	112.84	118.64	124.44	130.24	137.64
325*												70.14	77.68	85.18	92.63	100.08	107.53	114.98	122.43	129.88	137.33	144.78	152.23	159.68	167.13
426*													102.59	112.58	122.52	132.46	142.40	152.34	162.28	172.22	182.16	192.10	202.04	211.98	221.92

* Pipes manufactured by agreement.
Cold-formed pipes for high pressure boilers
Hot-formed pipes for high pressure boilers

Range of seamless high alloy steel pipes for power generation (as per TU 14-ZR-55-2001)

Outside diameter, mm	Wall thickness, mm																			
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6	7	8	9	10	11	12	14	15	16	18	20
	Weight per meter length, kg																			
10	0.39	0.46																		
12	0.49	0.59	0.67																	
16	0.69	0.83	0.96	1.08	1.18															
20	0.89	1.08	1.26	1.42	1.58	1.72	1.85													
22	0.99	1.20	1.41	1.60	1.78	1.94	2.10													
25	1.13	1.39	1.63	1.86	2.07	2.28	2.47	2.64	2.81											
28	1.28	1.57	1.85	2.11	2.37	2.61	2.84	3.05	3.26											
30	1.38	1.70	2.00	2.29	2.56	2.83	3.08	3.32	3.55											
32	1.48	1.82	2.15	2.46	2.76	3.05	3.33	3.59	3.85	4.32										
36	1.68	2.07	2.44	2.81	3.16	3.50	3.82	4.14	4.44	5.01										
38	1.78	2.19	2.59	2.98	3.35	3.72	4.07	4.41	4.74	5.35										
40		2.31	2.74	3.15	3.55	3.94	4.32	4.68	5.03		6.71									
42		2.44	2.89	3.32	3.75	4.16	4.56	4.95	5.33											
45		2.62	3.11	3.58	4.04	4.49	4.93	5.36	5.77											
50		2.93	3.48	4.01	4.54	5.05	5.55	6.04	6.51											
57					5.35	5.96	6.56	7.15	7.71	8.81	9.87	10.87	11.82	12.71	13.56	15.17	16.53	17.69		
60					5.65	6.30	6.94	7.56	8.17	9.35	10.47	11.55	12.58	13.55	14.47	16.23	17.74	19.05	20.16	
76						8.22	9.07	9.91	10.73	12.33	13.88	15.38	16.83	18.22	19.56					
83						9.03	9.96	10.90	11.8	13.58	15.32	16.99	18.62	20.19	21.71	24.6	25.96			
89						9.72	10.73	11.74	12.72	14.66	16.54	18.38	20.16	21.88	23.56	26.75	28.26			
102							12.4	13.57	14.72	16.99	19.21	21.37	23.48	25.54	27.55	31.41	33.26	35.05	38.49	40.72
108							13.17	14.41	15.64	18.06	20.43	22.75	25.02	27.23	29.39	33.56	35.56	37.51	41.26	44.79
114							13.93	15.25	16.56	19.14	21.66	24.13	26.55	28.92	31.24	35.71	37.86	39.97	44.02	47.86
121							14.83	16.24	17.64	20.39	23.1	25.75	28.35	30.89	33.39	39.21	40.55	42.83	47.24	51.44
133							16.36	17.93	19.48	22.54	25.55	28.51	31.42	34.27	37.07	42.51	45.16	47.75	52.77	57.59
140									20.55	23.8	26.99	30.12	33.21	36.24	39.22	45.02	47.84	50.62	56	61.17
146									22.48	26.02	29.51	32.93	36.3	39.62	42.87	49.21	52.29	55.32	61.19	66.13
152									23.44	27.15	30.79	34.38	37.92	41.39	44.81	51.47	54.71	57.89	64.09	70.06
159									24.57	28.46	32.3	36.07	39.79	43.46	47.06	54.1	57.53	60.9	67.47	73.82
168										29.78	34.23	38.25	42.21	46.11	49.96	57.48	61.15	64.77	71.82	78.65
194										34.6		44.53	49.19	53.79	58.33	67.25	71.62	75.93	84.39	92.61
219													55.9	61.17	66.39	76.64	81.69	86.67	96.46	106.03

Cold-formed pipes for high pressure boilers
Hot-formed pipes for high pressure boilers

PIPES FOR THE NUCLEAR INDUSTRY

Seamless hot-formed and cold-formed pipe is a critical element of nuclear power plant equipment. Pipes are used in pipelines, steam generators, condensers, and as fuel element cladding

MANUFACTURERS

TMK-INOX, CHTPZ, PNTZ

FEATURES

TMK-INOX manufactures pipes by cold-forming, cold rolling (on cold pilgers) or by drawing.

Hot-formed stainless steel pipes for the nuclear industry are produced at Chelyabinsk Pipe Plant on pilger mills. These mills are unique in that they can produce pipes with a diameter of up to 630 mm. Pipes are supplied after machining to ensure high surface quality.

Cold-formed stainless steel pipes for the nuclear industry are produced at Chelyabinsk Pipe Plant on cold pilgers. These mills can produce pipes with diameters from 90 mm to 426 mm and wall thicknesses from 2 mm to 40 mm.

The existing product quality control and traceability system ensures compliance of manufactured products with the following standards:

- TU 14-3R-197
- GOST 24030
- GOST 9941
- PNST 453
- TU 1.1.3.20.1433
- GOST R 70731.1
- additional technical requirements agreed with the customer.

The following types of pipes are available:

- with etched surface
- with electrochemically polished surface
- with ground surface
- with surface heat treated in a protective atmosphere
- with combined surface types.

Size range

Standards	Steel grade	Pipes dimensions	
		Outside diameter, mm	Wall thickness, mm
1	2	3	4
GOST 9941-2022	08Kh18N10T; 12Kh18N10T; 10Kh17N13M2T; 10Kh23N18; 06Kh28MDT; 08Kh22N6T	5.0	0.2-1.0
		5.0-426.0	0.2-40.0
		6.0-7.0	0.2-1.5
		8.0-9.0	0.2-2.0
		10.0-13.0	0.2-2.5
		14.0-17.0	0.2-3.0
		18.0-19.0	0.2-3.5
		20.0	0.2-4.0
		21.0-24.0	0.3-4.0
		25.0-28.0	0.3-4.5
		30.0-38.0	0.3-5.5
		40.0	0.3-6.0
		42.0	0.3-6.0; 8.0; 9.0
		45.0-50.0	0.3-9.0
		51.0-56.0	0.5-9.0
		57.0-60.0	0.5-10.0
		63.0-73.0	1.8-10.0
		76.0-83.0	2.8-10.0
		85.0	3.2-10.0
		89.0	2.8-10.0
		95.0	2.0-10.0
		100.0; 102.0	1.8-3.0
		114.0	6.0
GOST 10498	06Kh18N10T; 08Kh18N10T; 09Kh18N10T	4.0-6.0	0.2-0.5
		from 6.0 to 10	0.12-0.70
		from 10 to 25	0.12-1.0
		from 25 to 75	0.3-1.0
GOST 24030	08Kh18N10T	6.0; 7.0;	1.0-1.5
		8.0; 9.0	1.0-2.0
		10.0-13.0	1.0-2.5
		14.0-17.0	1.0-3.0
		18.0; 19.0	1.0-3.5
		20.0-24.0	1.0-4.0
		25.0-28.0	1.0-4.5
		30.0-36.0	1.0-5.5
		38.0	1.0-6.0
		40.0-45.0	1.2-6.0
		48.0-54. 0	1.4-7.5
		56.0; 57.0	1.5-7.5
		60.0-75.0	1.8-7.5
		76.0-83.0	3.0-7.5
		114-508	4.5-28
GOST R 70731.1-2023	20; 15KhM; 15Kh1M1F	88.9-426	3-28
GOST R 70731.2-2023	08Kh18N10T; 08Kh18N10T-Sh	6.0-10.0	1.0-2.0
TU 1;1;3;20;1433-2018	08Kh18N10T; 08Kh18N12T; 12Kh18N10T; 12Kh18N12T	11.0-13.0	1.0-2.5
		14.0-21.0	1.0-4.0
		22.0-28.0	1.0-4.5
		30.0-38.0	1.0-6.0
		40.0-45.0	1.2-7.0
		48.0-54.0	1.4-7.0
		56.0-76.0	1.5-7.0
		83; 89	3.5-7.0
		102; 114	5.0-7.0
		355-1620	6-14
1	2	3	4

Range (continued)

Standards	Steel grade	Pipes dimensions	
		Outside diameter, mm	Wall thickness, mm
1	2	3	4
TU 1.1.3.20.1433-2018 Steel pipes for nuclear power plants. Seamless steel pipes of austenitic stainless steels for equipment and pipelines of groups B and C. General specifications PNST 453-2020 Steel pipes for the manufacture of equipment and pipelines for nuclear power plants. General specifications. Part 2. Seamless austenitic pipes of steel grades 08Kh18N10T and 08Kh18N10T-Sh	08Kh18N10T	60.3	6.3
		76.1	4.0
		88.9	4-8
		114.3	5-14.2
		139.7	14.2-16.0
		168.3	8.8-11
		219.1	8.8-12.5
TU 1.1.3.20.1432-2018 Steel pipes for nuclear power plants. Seamless steel pipes of non-alloy and alloy ferritic steels for equipment and pipelines of groups B and C. General specifications	20. 15KhM	25-219	2.5-14
TU 13.03-011-00212179-2003 Spirall electric-welded pipes of grade 20 carbon steel for pipelines of nuclear power plants	20	530-1420	8-14
TU 95.349.2000 Longitudinal electric-welded pipes of steel grades 08Kh18N10T, 12Kh18N10T for nuclear and thermal power plants	08Kh18N10T; 12Kh18N10T	377-1220	6-14
TU 95.499-00 Longitudinal electric-welded pipes of steel grades 20 and 16GS for nuclear and thermal power plants	20 and 16GS		
TU 14-3-1070-81	09Kh18N10T; 06Kh18N10T	from 4.0 to 6.0 incl.	0.2-0.5 incl.
		from 6.2 to 10.0 incl.	0.2-0.7 incl.
		from 10.2 to 25.0 incl.	0.2-1.0 incl.
		from 25.2 to 60.0 incl.	0.3-1.0 incl.
TU 14-3-1109-82	08Kh18N10T; 08Kh18N12T; 12Kh18N10T; 12Kh18N12T; 10Kh17N13M2T	5.0	0.2-1.0
		6.0; 7.0	0.2-1.5
		8.0; 9.0	0.2-2.0
		10.0- 13.0	0.2-2.5
		14.0-17.0	0.2-3.0
		18.0; 19.0	0.2-3.5
		20.0	0.2-4.0
		21.0-24.0	0.3-4.0
		25.0-28.0	0.3-4.5
		30.0-35.0	0.3-5.5
		36.0	0.4-5.5
		38.0-45.0	0.4-6.0
		48.0-50.0	0.4-7.0
		51.0-60.0	0.5-7.0
		63.0-75.0	1.5-7.0
TU 14-161-216-2003	09Kh18N9	16.0	1.5-2.5
TU 14-161-242-2012	03Kh18N13S2AM2VFBR-Sh	18.0	3.0
1	2	3	4

Range (continued)

Standards	Steel grade	Pipes dimensions	
		Outside diameter, mm	Wall thickness, mm
1	2	3	4
TU 1361-023-00212179-2005	08Kh14MF 08Kh14MF-Sh	6; 7	1.0-1.5
		8; 9	1.0-2.0
		10; 11;12;13	1.0-2.5
		14; 15; 16; 17	1.0-3.0
		18; 19	1.0-3.5
		20; 21; 22; 23; 24	1.0-4.0
		25; 27; 28	1.0-4.5
		30; 32; 34;35;36	1.0-5.5
		38	1.0-6.0
		40; 42;45	1.2-6.0
		48; 50; 51; 53; 54	1.4-8.0
		57	1.5-8.5
		60; 63; 65;68	1.8-9.0
		6.0; 7.0	1.0-1.5
		8.0; 9.0	1.0-2.0
TU 14-3R-197-2001	08Kh18N10T 08Kh18N10T-U	10.0-13.0	1.0-2.5
		14.0-17.0	1.0-3.0
		18.0; 19.0	1.0-3.5
		20.0-24.0	1.0-4.0
		25.0-28.0	1.0-4.5
		30.0-36.0	1.0-5.5
		38.0	1.0-6.0
		40.0-45.0	1.2-6.0
		42.0-630.0	4.0-28.0
		48.0-54.0	1.4-7.5
		56.0; 57.0	1.5-7.5
		60	5.5
		63	6.5-7.0
		68	2.0
		76	3.0-7.0
		83	3.5
		89	5.0
		114	5.0-7.0
		16	1.5
		95-426	2-40
1	2	3	4

SPECIAL PIPES

Pipes for various industries: power, chemical, construction, machine building, automotive, food, medical and other industries.

This pipes are used in high-reliability high-pressure pipelines

MANUFACTURERS

VTZ, SinTZ, TMK-INOX,
PNTZ, CHTPZ

FEATURES

Pipes manufactured by hot rolling with or without mechanical machining, cold rolling and drawing. Pipes meet different requirements for dimensions, steel grades, manufacturing tolerances, mechanical properties, and surface quality, depending on the production technique and the requirements of applicable standards.

Pipes are made of carbon and alloy steels to Russian and foreign standards as well as to manufacturer’s specifications designed to meet the technical requirements of specific customers.

Mandatory testing and quality control is performed in full compliance with product standards and specific customer requirements.

SPECIAL CAPABILITIES

- wide range of pipes (diameters from 1.5 mm to 630 mm, wall thicknesses from 0.25 mm to 70 mm)
- manufacture of capillary pipes of minimal size (diameter from 1.5 mm)
- manufacture of pipes with variable section.

TYPES OF ACCEPTANCE

- acceptance by customer
- acceptance by relevant authorities.

Standards

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
ASTM A 213/A 213M Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes	6.35-168.3	0.4-28	TP304; TP304L; TP316; TP316L; TP316Ti; TP321; TP304H; TP347; TP 347H
DIN EN 10297–1 Seamless circular steel tubes for mechanical and general engineering purposes Technical delivery conditions. Part 1. Non-alloy and alloy steel tubes	26.9-108*	2.6-11	34CrMo4; E355
	32-219.1	2.9-40.0	
	219.1	17.5	
	244.5	17.5	
	273.1	8-9	
	355.6	7.4-10	
	355.6	12.7	
	406.4	8; 8.3; 11.5	
	413	10	
DIN EN 10297-2 (DIN 17456) Seamless circular steel tubes for mechanical and general engineering purposes. Part 1. Technical delivery conditions. Part 2. Stainless steel	6-88.9	0.8-8	X6CrNiTi1810
GOST 800-78 Bearing tubes	23.0-81.2*	4.0-12.0	ShKh15; ShKh15-V; ShKh15SG; ShKh15-Sh; ShKh15SG-Sh; 100Cr6; 100CrMnSi6-4; ShKh15SG-V
	53.4-200.0	6.4-29.2	
GOST 1060-83 Cold-formed seamless steel tubes for shipbuilding	17-60	2.0-3.75	10
GOST 24030-80 Corrosion-resistant steel seamless tubes for power engineering industry	6-83	1-7.5	08Kh18 N YuT
TU 14-3-292-74 Semi-finished rectangular pipes for cotton harvesters	120x60*	5.5	20; 35
TU 14-3-335-75 Seamless hot-rolled pipes of ShKh-15 steel grade	83.0-219.0	7.0-42.0	ShKh15; ShKh15-Sh; ShKh15CG; ShKh15CG-Sh
TU 14-3-367-75 Seamless hot-rolled pipes for aircraft equipment	70-219	16-30	12Kh2N4A-VD; 18Kh2N4MA-Sh; 12Kh2N4-VD
TU 14-3-474-76 Seamless cold-drawn pipes for the manufacture of absorption refrigerators	6-63*	0.6-1.3	10; 20
TU 14-3-675-78 Seamless hot-rolled steel pipes for aircraft equipment	38-450	3.5-55.0	10–45; 38KhA; 30KhGSA; 30KhGSN2A; 12KhNZA; 38Kh2 MYuA; 30KhGSNMA
TU 14-3-730-78 Seamless cold-drawn pipes for monopole antenna rods	6-12	1.2	30KhGSA
TU 14-3-772-78 Seamless hot-formed steel pipes	78-121	12.0-21.0	35; 45; 15Kh; 40Kh
TU 14-156-89-2010 Seamless hot-formed high-precision steel pipes for submersible motor and pump housings	92.3-125.0	int. 78-107	33; 35; 35G
TU 14-156-53-2005 Seamless hot-formed pipes of steel grade ShKh4	70.0–171.0	7.1–28.0	ShKh4; ShKh4-V
TU 14-157-53-2000 Square hot-rolled steel pipes for structures and machine parts and for other technical purposes	112x112	19	St. YuA; st. 20A
TU 14-159-161-90 Cold-formed seamless steel pipes for vehicle parts	45*	8.5	35; 45
TU 14-159-195-90 Hot-formed pipes of steel grades 15KhM and 30KhMA for the bushings of chain links of heavy industrial tractor tracks	83-92	12.0-23.0	15KhM; 30KhMA
TU 14-3R-579-2007 Thick-walled steel pipes for diesel engines	146-219	18.0-42.0	38Kh2MYuA
TU 14-3R-773-2007 Cold-formed seamless steel pipes	4-83*	0.5-12	10; 20; 30; 35; 45; 15H; 20H; 40H; 30KhGSA
TU 14-156-117-2022 Seamless hot-formed steel pipes of SP-28 steel grade	245-325	16-20	SP-28 (28Kh3SNM1FA)
1	2	3	4

* Cold-formed.

Microstructure of bearing tube metal (after isothermal spheroidizing annealing)

Steel grade	Micropores, points	Microstructure	Remaining carbide network, points	Carbide segregation, points	Micropores, points	Non-metallic inclusions, points	Hardness, HB
			max				
ShKh15, ShKh-15V	2.0	fine-grained perlite	3	1.5	2.0	2.5*	207–255 cold-def. pipes 207–187 hot-def. pipes
ShKh15SG	2.0	fine-grained perlite	3	1.5	2.0	2.5	217 - 197

* Acceptable score for oxides, sulfides and non-deformable globules

Bearing tube range

Outside diameter, mm	Wall thickness, mm										
	3.0 - 6.9	7.0 - 9.0	9.1 - 10.0	10.1 - 11.0	11.1 - 13.0	13.1 - 15.0	15.1 - 17.0	17.1 - 19.0	19.1 - 21.0	21.1 - 23.0	23.1 25.0
20.0-83.0*											
56.0-60.0											
60.1-70.0											
70.1-80.0											
80.1-90.0											
90.1-100.0											
100.1-110.0											
110.1-120.0											
120.1-130.0											
130.1-140.0											
140.1-150.0											
150.1-160.0											
160.1-170.0											
170.1-180.0											

Range by agreement

Cold-formed bearing tube

Hot-formed bearing tube

Bearing tube range is limited by the ratio of outside diameter to wall thickness D/S = 4–15. Minimum ID of hot-rolled bearing tube is 48 mm.
Pipes lengths: 2.0 m to 5.0 m (hot-rolled) or 2.5 m to 4.5 m (cold-rolled).
Limit deviations of pipes dimensions:
a) OD
+0.2 mm for hot-rolled bearing tube
+0.4 mm for 20.0 mm–60 mm cold-rolled bearing tube+0.5 mm for 60.1 mm–83.0 mm cold-rolled bearing tube

b) Wall thickness
for hot-rolled pipes:

4.0 < D/S ≤ 11 +15%
11.0 < D/S ≤ 12.5 +20%
12.5 < D/S ≤ 15 +25%

for cold-rolled pipes:
+12%
c) Curvature
1.0 mm per meter length

04.

Products for infrastructural projects



Pipes for pile foundations and hydraulic structures
(tubular sheet piles)

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PIPES FOR PILE FOUNDATIONS AND HYDRAULIC STRUCTURES

(TUBULAR SHEET PILES)

Piles and tubular welded sheet piles are used across all climatic regions in the sheet piling of permanent and temporary structures in hydraulic, transport, industrial, and civil engineering

MANUFACTURERS

CHTPZ, SOT, TMK-PS
TMK Steel Technologies

FEATURES

Piles and tubular sheet piles are made from longitudinal electric welded large diameter steel pipes produced by TMK-PS, of various steel grades, with diameters from 508 mm to 1,422 mm, 2,020 mm and 2,520 mm, and wall thicknesses from 7 mm to 50 mm. Single-segment piles and welded tubular sheet piles are available in lengths up to 18.3 m. Butt-weld piles and tubular sheet piles can be supplied with lengths up to 24 m. Tubular sheet piles can be manufactured with different types of interlocks depending on the customer requirements. If and when necessary, piles and sheet piles can be supplied with reinforcing pads at the top and bottom ends. Anti-corrosion coating can be applied on request.

Piles

Standards	Pipes dimensions		Steel grade
	Outside diameter, mm	Wall thickness, mm	
1	2	3	4
EN 10219-1:2006 Cold formed welded structural hollow sections of non-alloy and fine grain steels	508-1,422	7-48	S235JRH; S275J0H; S275J2H; S275NH; S275MH; S275NLH; S275MLH; S355NH; S355J0H; S355K2H; S355J2H; S355MH; S355NLH; S355MLH; S420MH; S420MLH; S460NH; S460MH; S460NLH; 460MLH
	2,020; 2,520*	20-40	
GOST 10706-76 Electric welded longitudinal steel pipes	508-1,422	7-48	St3; steel 20; 17G1S; 17G1SU; 13GS; 13GSU; 13GS1SU; 08GBYu; 09GBYu; 12GSB; 12GS2SB; 08G1NFB; 10G2FBYu; 09GSF; 13KhFA
	2,020	20-40	
GOST 20295-85 Steel welded pipes for main gas-and-oil pipelines	508-1,422	7-48	KZ4; K38; K42; K50; K52; K54; K55; K56; K60
GOST 33228-2015 Steel welded pipes for general purposes	508-1,422	7-48	KP175; KP185; KP195; KP205; KP235; KP245; KP265; KP345; KP355; KP380; KP390; KP410; KP460
TU 1381-020-00186654-2011 Longitudinally electric-welded steel pipes with diameters from 530 to 1,420 mm with improved weldability and for low-temperature service for use in steel structures of buildings	508-1,422	7-48	K52; K54; K56; K60; Kh56; Kh60; Kh65; Kh70
TU 1381-042-00186654-2012 Longitudinally electric-welded steel pipes with diameters from 530 to 1,420 mm with improved weldability and for low-temperature service for use in steel structures of buildings	508-1,422	7-48	S345; S375; S390; S440
TU 14-3R-124-2017 Seamless steel pipes with improved corrosion resistance for the development	76-426	6-22 6.0-28.0 6.5-28.0 7.0-32.0	13KhFA; 08KhMChA 20A; 20S; 20FA
	108-168		
	168-426		
Other customer-specified standards	508-1,422	7-48	
	2,020; 2,520*	20-40	
1	2	3	4

* Preparation of production.

Pipes sheet pile

Standards	Pipes dimensions		Steel grade	Shaped steel sections for tong-and-groove joints
	Outside diameter, mm	Wall thickness, mm		
1	2	3	4	5
GOST R 52664-2010 Welded pipes sheet piles	508-1,422	7-48	Depending on the pipes specifications and customer requirements	ZSG1; ZZSG1*; SG2; Larsen 4; Larsen 5; GU16-400; ShK-1; UT; FL-510; FL-511; FL-512; AS 500-9-5; AS500-11;0; AS 500-12;0; GR; OB; UG; UE; PB; other interlocks of various shapes available on demand
	2,020; 2,520*	20-40		

05.

CONTINUOUS CAST BILLET



Round billets

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Square billets

78

CONTINUOUS CAST BILLET

ROUND BILLETS. SQUARE BILLETS

Continuous cast square and round billets of carbon and alloy steels with special properties are used in the production of pipes, long products and special products

MANUFACTURERS

VTZ, STZ, TAGMET, PNTZ

FEATURES

- steel melting in electric arc furnaces, secondary steelmaking with vacuum degassing (as and when required by applicable standards) and continuous casting
- tight tolerances on alloying element content
- ultrapure metal with low content of harmful impurities (maximum 0.005% sulfur and maximum 0.010% phosphorus)
- supply of machined billets
- obtaining a fine-grain structure.

SIZE RANGE

Square billets with the following side lengths:*

- 360 (360), 300 (300), 240 (240) mm.

Round billets with the following diameters:*

- 145, 150, 156 (150), 196 (190), 210, 228 (220), 250, 290, 340 (330), 360 (350), 400, 410, 550, 600 mm.

* Dimensions in parentheses are for machined billets.

Standards

Standards	Billet dimensions		
	Cross-section dimensions,* mm		Length, m
1	2	3	4
STO VTZ 53570464-10-2021 Continuous cast billet made in EAF	Cast round bar	150	8.4-11.5
		156	8.4-11.5
		196	8.0-11.5
		228	6.0-11.5
		260	6.0-11.5
		340	4.0-11.0
		360	4.0-11.0
		410	4.0-8.50
	Square	240	4.0-9.0
		300	
		360	
STO STS 22.03-2021 Continuous cast steel billets for the manufacture of hot-formed seamless pipes	Round	290	3.0-12.0
		360	
STO TAGMET 00186602-003 Continuous cast round billet for the manufacture of seamless pipes	Round	150	5.16-12.0
		210	4.5-12.0
		250	3.75-12.0
		300	3.6-12.0
		340	3.6-12.0
		400	3.6-12.0
STO TMK 56601056-008-2006 Continuous cast round steel billet for the manufacture of seamless pipes	Unmachined round	156	5.8-11.3
	Round	150-156 (150-145)	
	Machined round	150; 145	
TU 14-1-4944-2003 Continuous cast square billets for pipes and long products	Square	240	4.0-8.7
		300	
		360	
GOST 10791, GOST R 51220, DIN EN 13262 Continuous cast round steel billet for the manufacture of rail wheels	Round	400; 460	5.0-10.0
EN 10083-2 Continuous cast square steel billet for quenching and tempering	Square	360x360	8.0
GOST 4728 Continuous cast round steel axle billets for railway rolling stock as per GOST 33200, DIN EN 13261	Round	400	4.0-6.0
SAE 1006, SAE 1008 Continuous cast square steel billet for wire rod manufacture	Square	150x150	10.0-12.0
GOST 380 Continuously cast square steel billet for the manufacture of reinforcing steel	Square	125x125	3.0-4.0
1	2	3	4

* Dimensions in parentheses are for machined billets.
Steel grades as per GOST 380, 1050, etc.
Billets may be accepted in accordance with OST 14-21-77 and STP 156.02.03-2004 by agreement with the customer

06.

Anti-corrosion pipe
coating



ANTI-CORROSION PIPE COATING

MANUFACTURERS

Truboplast,
TMK NGS-Nizhnevartovsk,
TMK PS, "Uralchermet"

Truboplast applies the following types of coatings:

- external anti-corrosion single layer epoxy coating
- external anti-corrosion two layer polyethylene coating
- external anti-corrosion three layer polyethylene coating
- external anti-corrosion monolayer polyethylene coating
- outside thermoinsulation coating based on rigid polyurethane foam with anticorrosion coating of steel pipe and outside protective hydroinsulation layer (polyurethane, zinc, metal-polymeric).

A range of coatings and materials for the corrosion protection of the external surface of weld joints by Truboplast provide complete corrosion protection of steel pipes.

TMK NGS-Nizhnevartovsk applies the following types of anti-corrosion coatings to pipes:

- external anti-corrosion epoxy coating
- external two and three-layer anti-corrosion extruded polyethylene coating,
- internal two-layer anti-corrosion coating for pipeline, tubing and drill pipes.

Additionally, TMK NGS-Nizhnevartovsk applies external and internal anti-corrosion coatings on pipeline connection elements

TMK PS applies the following types of anti-corrosion coatings to pipes:

- external single-layer anti-corrosion epoxy coating
- external two-layer anti-corrosion epoxy coating
- external two-layer anti-corrosion PE coating
- external three-layer anti-corrosion PE coating
- external single-layer anti-corrosion PE coating
- external three-layer anti-corrosion PP coating
- external protective coating
- internal flow coating
- internal anti-corrosion coating (including for water pipelines).

Uralchermet applies the following types of anti-corrosion coatings to pipes:

- external single-layer anti-corrosion epoxy coating
- external two-layer anti-corrosion extruded polyethylene based coating
- external three-layer anti-corrosion extruded polyethylene based coating
- external single-layer anti-corrosion polyethylene coating
- external thermal insulation and waterproofing consisting of a layer of rigid polyurethane foam,with an anti-corrosion coating of steel pipes and an outer protective waterproof sheath
- external thermal insulation coating (including for connecting parts) with polyethylene, galvanized or metal-polymer shells.

Standards. Intended use

Standards	Intended use of coated pipes
1	2
CAN CSA Z245.21-14 Factory-Made External Polyethylene Coating for Steel Pipes	For buried or submerged pipelines in oil or gas transportation systems
DIN 30670:2012 Polyethylene coatings on steel pipes and fittings. Requirements and testing	Protection of buried or submerged steel pipelines
DIN 30678:2013 Polypropylene coatings on steel pipes and fittings. Requirements and testing	Corrosion protection of buried or submerged steel pipes and fittings used to convey liquids and gases
DIN EN ISO 21809-1:2011 Petroleum and natural gas industries – External coatings for buried or submerged pipelines used in pipeline transportation systems. Part 1. Polyolefin coatings (3-layer PE and 3-layer PP)	Corrosion protection of welded and seamless pipes used in pipeline transportation systems in the oil and gas industry
ISO 21809-1-2018 Petroleum and natural gas industries – External coatings for buried or submerged pipelines used in pipeline transportation systems. Part 1. Polyolefin coatings (3-layer PE and 3-layer PP)	Corrosion protection of welded and seamless steel pipes for transportation systems in the oil and gas industry
GOST R 51164-98 Steel pipes mains. General requirements for corrosion protection	Trunk pipelines transporting natural gas, oil and petroleum products; other pipelines
GOST 9.602-2016 Underground constructions. General requirements for corrosion protection	Corrosion protection of the outer surfaces of steel structures below grade or in an embankment: pipelines transporting natural gas (trunk or distribution pipelines), crude oil or petroleum products, and their branch lines; water pipelines; piles, sheet piles, columns, and other load-bearing below-grade steel structures
GOST 31448-2012 Steel pipes with defensive coverings for main gas and oil pipelines	Construction and repair of trunk gas, oil pipelines and petroleum product pipelines
1	2

Size range

Coated pipes diameter, mm	Length, m	Wall thickness, mm
EXTERNAL COATING		
114-426	8-12.5	6-36
508-1422	9-18.3	7-45
INTERNAL COATING		
508-1422	9-18.3	7-42
THERMAL INSULATION OF PIPES		
530-1020	10.5-12.2	8 -19
THERMAL INSULATION OF CONNECTION ELEMENTS		
426-1220	4-12.2	8-24

Properties of two and three-layer extruded polyethylene based coatings

Property	Requirement	
	two-layer coating	three-layer coating
1. Appearance	Coating must be continuous with black smooth uniform surface, without visually detectable peeling, bubbles or gaps	
2. Minimum coating thickness, mm	High type according to GOST R 51164-98	
	Up to 273 incl. 2.0	
	From 273 to 530 incl. 2.2	
	From 530 to 720 incl. 2.5	
	Very High type according to GOST R 9.602-2005	
	From 57 to 89 incl. 2.2	
	102 to 259 2.5	
	273 to 426 3.0	
	530 to 720 3.5	
3. Dielectric continuity	Ability to withstand a voltage of no less than 5 kV per 1 mm of coating thickness + 5 kV without breakdown	
4. Minimum contact resistance of coating in a 3% NaCl solution at (20±5)°C, Ω·m²: – initial – after 100 days in the solution	10 ¹⁰ 10 ⁹	
5. Minimum impact strength, J/mm of coating thickness, at: (50±3)°C (20±5)°C minus (40±3)°C	3 5 6	3 5 6
6. Minimum coating adhesion to steel, N/cm of width, at: (20±5)°C (40±3)°C (60±3)°C	70 50 20	100 70 30
7. Minimum coating adhesion to steel, N/cm of width, after holding for 1,000 h in water at: (20±5)°C (40±3)°C (60±3)°C	50 50 50	– – –
8. Maximum reduction of coating adhesion to steel, % of the initial value, after holding in water for 1,000 h at: (20±5)°C (60±3)°C	– –	30 33
9. Maximum peeling area under cathodic polarization, cm², after 30 days of testing in a 3% NaCl solution at: (20±5)°C (40±3)°C (60±3)°C	5.0 10.0 15.0	4.0 – 10.0
10. Minimum tensile strength of peeled coating, MPa, at: (20±5)°C (60±3)°C	12.0 10.0	12.0 10.0
11. Minimum elongation at break of peeled coating, %, at: (20±5)°C minus (40±3)°C	200 100	350 100
12. Maximum reduction of elongation at break of peeled coating, % of initial value after holding for 1,000 h in air at (110±3)°C	25	25
13. Change in the polyethylene melt flow rate, % from the initial value, after holding for 100 days in air at (110±3)°C	35	35
14 Minimum cracking resistance of coating at (50±3)°C, h	1,000	1,000
15. Minimum resistance to UV radiation with a flux of 600 kW·h/m at (50±3)°C, h	500	500
16. Minimum fungus resistance, points	2	2
17. Minimum penetration (indentation) resistance, mm, at: (20±5)°C (60±3)°C	0.2 0.3	0.2 0.3
18. Minimum coating resistance to thermal cycling; number of cycles without peeling or cracking of the coating at temperatures: from minus (50±3)°C to plus (20±5)°C from minus (60±3)°C to plus (20±5)°C (for Far North environments)	10 –	– 10

Properties of external single-layer anti-corrosion PE pipes coating

Property	Value for coating types:			
	Normal	Special	Heat-resistant	Special heat-resistant
1. Minimal total coating thickness, mm, for pipes of a diameter: up to 273 mm incl. greater than 273 mm to 530 mm 530 mm–820 mm 820 mm–1,420 mm	2.0 2.2 2.5 3.0	2.5 2.7 3.0 3.5	2.0 2.2 2.5 3.0	2.5 2.7 3.0 3.5
2. Dielectric continuity of coating Absence of breakdown at electrical voltage, kV, minimum	20			
3. Minimum elongation at break of PE coating layer at minus 45°C, %	100			
4. Minimum impact resistance of coating, J/mm, at: minus 45°C 60°C	7 (5)2 4 (3) 2	8 5	7 4	8 5
5. Minimum coating adhesion, N/cm, at: 25°C 60°C 80°C	200 (120) 2 80 (50) 2 –	250 100 –	250 100	250 – 100
6. Minimum coating adhesion at 23°C after holding in water for 1,000 h, N/cm, at: 80°C 95°C	100 (70) 2 –	100 –	– 100	– 100
7. Minimum initial contact resistance of coating in a 3% NaCl aqueous solution at 23°C, Ω·m²	1,010			
8. Coating resistance under cathodic polarization. Maximum area of peeling after holding for 30 days, cm², at: 60°C 80°C	10 –	10 –	– 20	– 20
9. PE coating layer resistance to thermal aging. Minimum elongation at break after holding in air for 100 days, %, at: 110°C 120°C	400 (300) 2 –	400 –	– 400	– 400
10. Coating resistance to thermal cycling, maximum number of cycles, for temperature variation between minus 60°C and plus 23°C	10	10	10	10
11. Degree of cure of primer ΔTg, °C	Within a range of minus 3 ≤ ΔTg ≤ plus 2			
12. Maximum PE coating layer shrinkage at 150°C, %	45			

Properties of external three-layer anti-corrosion PP pipes coating

Property	Value for coating types:	
	DIN 30678	ISO 21809-1
1. Minimal total coating thickness, mm, for pipes of diameters: up to 273 incl. greater than 273 to 530 incl. greater than 530 to 820 incl. greater than 820	2.0 2.2 2.5 3.0	Depending on pipes weight and coating class
2. Minimum dielectric continuity of coating, kV	25	10 kV/mm, but no more than 25 kV
3. Minimum coating adhesion, N/cm of width, at testing temperatures of: a) (25±10)°C b) (90±3)°C c) (110±5)°C	250 40 –	250 40 –
4. Minimum impact resistance of coating, J/mm of thickness, at 20°C or 25°C:	10	10
5. Maximum area of cathodic coating peeling, cm², after 30 days of testing at: a) (20±5)°C b) (60±3)°C c) (80±5)°C	7 (28 days) 7 (24 h) 15 (28 days)	7 (28 days) 7 (24 h) 15 (28 days)
6. Coating resistance to thermal cycling; minimum number of cycles without coating peeling or cracking, at temperatures from minus 20°C to plus °C	–	–
7. Minimum resistance of coating to indentation (penetration), mm, at test temperatures of: a) (20±5)°C b) (60±3)°C	0.1 –	0.1 0.4 (at the maximum temperature)

INTERNAL PIPE COATING

Internal coating, depending on its type, is designed to reduce hydraulic resistance of gas pipelines and protect the internal surface of pipes from atmospheric corrosion during pipe transportation, storage and installation.

Internal coating can be applied before or after external coating application. Allowable ambient temperatures for continuous operation of gas pipelines range from –20°C to +80°C.

Standards

Standards	Purpose of coating
1	2
API* 5L2 (RP 5L2)-2015 Recommended Practice for Internal Coating of Line Pipes for Non-corrosive Gas Transmission Service (smooth coating)	For non-corrosive gas transmission. Coating is intended for drag reduction in gas pipelines, as well as for the protection of internal surface of pipes against atmospheric corrosion during transportation, storage and installation
1	2

Properties of internal drag-reduction (smooth) coating

Property	Unit of measurement	Parameters
1. Thickness of cured coating	µm	60 - 150
2. Cross-cut test of coating adhesion	points	1
3. Maximum adhesion of coating after holding for 240 hours in water at (20+5)°C as determined by the cross-cut test	points	2
4. Coating resistance to bending	mm	10
5. Minimum Buchholz hardness	hardness units	94
6. Maximum number of pores in the coating a) uncured b) cured	pores/cm²	0
7. Coating resistance to changes in gas pressure	–	1 No bubbles or damage after the 10 th cycle
8. Coating resistance to changes in hydraulic pressure	–	No bubbles or damage after the 1 st cycle
9. Resistance against exposure to salt spray at (25±5)°C for 240 hours	–	Absence of bubbles and peeling
10. Maximum coating roughness (Rz)	µm	15

Properties of thermal insulation and waterproof coating

Property	Norm
1. Appearance	Fine-cell yellow to dark brown material
2. Minimum density, kg/m³	60
3. Minimum compressive strength at 10% deformation in radial direction, MPa	0.3
4. Minimum volume fraction of closed pores, %	88
5. Use temperature, °C	130
6. Maximum water absorption in a 90-minute boiling test, vol%	10
7. Minimum axial shear strength, MPa, at: (23±2)°C (140±2)°C*	0.12 0.08
8. Minimum tangential shear strength, MPa, at:* (23+2)°C (140±2)°C	0.2 0.13
9. Maximum radial creep at a test temperature of 140°C, mm, after:° 100 h 1,000 h	2.5 4.6
10. Maximum thermal conductivity at an average temperature of 50°C, W/m·°C	0.033

Properties of external epoxy coating

Property	Parameters
	Modification: normal (N)
1. Appearance	Homogeneous, smooth surface without visually detectable gaps, tears, chips, bubbles, or cracks. Separate sags, worn spots, scratches, or traces of repair are allowed
2. Dielectric continuity	Absence of breakdown at 2.5 kV
3. Minimum thickness, mm	0.35
4. Minimum impact resistance at temperatures from minus 40°C to 40°C, J, for pipes diameters: from 57 mm to 273 mm from 325 mm to 530 mm	4.0 6.0
5. Maximum adhesion to steel at 20°C and 80°C, points	1
6. Maximum adhesion to steel after holding in water for 1,000 hours at 20°C and 50°C, points	1
7. Maximum peeling area after holding for 30 days in a 3% NaCl solution at a polarization potential of minus 1.5 V, cm², at: 20°C 80°C	5.0 8.0
8. Minimum contact resistance after holding in a 3% NaCl solution at 20°C for 100 days, Ω·m²	10 ⁷
9. Minimum elongation at break of free film at 20°C, %	5
10. Maximum indentation (penetration) resistance, mm, at: 20°C 80°C	0.2 0.3

THERMAL INSULATION MADE OF POLYURETHANE FOAM

Pipes and connection elements for heating networks and oil and gas pipelines are available with anti-corrosion coatings in thermal insulation made of polyurethane (PU) foam as well as with the following protective sheaths:

- galvanized steel for aboveground and cased underground pipelines
- steel with polymer coating for underground pipelines.

Pipes with PU foam insulation can be provided with inserts preventing spread of fire. Pipes and connection elements can be equipped with sensor wires for surveillance systems and tubes for an induction-resistance heating system (IRHS).

Standards. Intended use

Standards	Purpose of coating
GOST 30732-2020 Steel pipes and shaped products with foamed polyurethane thermal insulation in protective sheath	Pipes and fittings for underground heating networks (uncased, in ducts impassable for people or in crawl space; or, when steel galvanized sheath is provided, in service ducts or tunnels) or aboveground heating networks (hereinafter referred to as insulated pipes and fittings) with the following design parameters of heat transfer medium (superheated water): working pressure according to the design documentation and temperature up to 150°C, with heat supply control range of 150°C to 70°C

Properties of thermal insulation coating

Property	Value
1. Appearance	Rigid cellular plastic of light yellow to light brown color with uniform fine-cell structure
2. Minimum apparent density, kg/m³	60
3. Minimum compressive strength at 10% deformation in radial direction, MPa	0.3
4. Maximum thermal conductivity at (50±3)°C, W/m·K	0.033
5. Maximum water absorption in 90-minute boiling test, vol%	10
6. Minimum axial shear strength at (23±2)°C, MPa	0.12
7. Minimum tangential shear strength at (23±2)°C, MPa	0.2

07.

Cylinders



CYLINDERS

Cylinders are intended for the storage and transportation of various compressed, liquefied and dissolved gases at temperatures from minus 50°C to plus 60°C at a high operating pressure

MANUFACTURERS

PNTZ

FEATURES

Cylinders are all-metal and seamless.

Cylinders are classified by capacity into:

- small capacity, up to 12 L
- medium capacity, up to 50 L
- large capacity, from 50 L to 650 L.

Cylinders are made from seamless pipes of unalloyed or alloyed (including stainless) steel grades. Small- and medium-capacity cylinders can be made with one or two necks, and with a concave base in line with regulatory requirements.

Small- and medium-capacity cylinders can be supplied with valves, rings, caps, and boots in line with regulatory requirements.

Large-capacity cylinders can be made with one or two necks in line with regulatory requirements. Large-capacity cylinders are supplied without valves.

Cylinders are marked and painted in line with the customer’s order and regulatory documentation. Cylinders, other than those listed in the table, can be made to various technical specifications.

Standards number and OKP code	Product name	Capacity, l	Working pressure, MPa (kgf/cm²)	Diameter, mm	Steel grade
1	2	3	4	5	6
GOST 949-73 OKPD2 25.29.12.110	Small- and medium-capacity steel gas cylinders for P _w ≤ 19.6 MPa (200 kgf/cm²). Note: 1. Cylinders with capacities and lengths other than those specified in Table 1 of GOST 949-73, can be manufactured at the customer's request. 2. Cylinders with a concave base can be manufactured by agreement with the customer	0.4; 0.7; 1.0; 1.3; 2.0; 3.0; 4.0; 5.0; 6.0; 7.0; 8.0; 10.0; 12.0	9.8 (100) 14.7 (150) 19.6 (200)	70; 89; 108; 140	Non-alloy steel. 30KhGSA
OKPD2 25.29.12.110	Cylinders with a capacity of 2.0 l or less, with a spherical base only	20; 25; 32; 40; 50		219	
GOST 9731-79 OKPD2 25.29.12.120	Steel seamless cylinders of large capacity for gases for P _w ≤ 24.5 MPa (250 kgf/cm²). Note: 1. Cylinders of modifications 1 and 3 for P _w = 24.5 MPa (250 kgf/cm²) can be made by agreement with the customer	80; 100; 130; 160; 200; 250; 320; 400; 500	9.8 (100) 14.7 (150) 19.6 (200) 24.5 (250)	325; 377; 426; 465	Non-alloy steel
		80; 100; 130; 160; 200; 250; 320; 400; 500	14.7 (150) 19.6 (200) 24.5 (250)	325; 377; 426; 465	
GOST 12247-80 OKPD2 25.29.12.120	Large seamless steel gas cylinders for operating pressure of 31.4 and 39.2 MPa (320 and 400 kgf/cm²). Note: 1. Cylinders of modifications 1 and 3 can be made by agreement with the customer	80; 100; 130; 160; 200; 250; 320; 400; 500	31.4 (320) 39.2 (400)	325; 377; 426; 465	38KhA. 40Kh
TU 1410-007-29416612-2005	Steel cylinders for inert gas storage in gaseous fire extinguishing systems	20; 40; 50; 60; 80; 100	6.0 (61) 6.5 (68) 14.7 (150) 20.0 (204)	227; 317; 320; 322	34CrMo4
TU 1410-007-29416612-2005	Steel cylinders for the transportation and storage of compressed industrial gases	20; 25; 32; 40; 50 80; 97; 100;170	14.7 (150) 19.6 (200) 20.0 (204)	219; 229	34CrMo4
TU 1410-007-29416612-2005	Steel cylinders for the on-board storage of compressed natural gas (methane) as motor fuel for vehicles	18.5; 22.5; 23; 33; 34; 37; 39; 44; 50; 52; 53; 62; 65; 66; 70; 76; 77; 80; 86; 92; 100; 108; 114	20.0 (204)	219; 229; 254; 322; 356; 406	34CrMo4
TU 1410-702-0750107-2011	Large-capacity seamless steel gas cylinders for P _w ≤ 24.5 MPa (250 kgf/cm²)	80; 97; 100	24.5 (250)	329	34CrMo4

Appendix

01.

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02.

CHEMICAL COMPOSITION OF STEEL	Seamless pipes	120
	Welded pipes as per GOST 10704/10706	120
	Bearing tubes as per GOST 800-78	120
	Seamless pipes for the oil refining and petrochemical industries (petroleum cracking pipes) as per GOST 550-75	121
	Seamless corrosion-resistant steel pipes (stainless steel pipes)	121
	Seamless pipes for the thermal power industry (pipes for power generation)	122

Steel melting and casting



CONTROLLED PARAMETERS

Scrap weight, chemical composition and dimensions; fractional and chemical composition, moisture content and weight of materials; metal temperature; vacuum level, cooling modes, casting rate; cut quality and length; billet traceability, external surface, geometric dimensions, number of billets, macrostructure, and other.

Seamless pipes

Pipes rolling line with a PQF 10 3/4" continuous pipes rolling mill



Seamless pipes

TPA 50-200 pipes rolling line with an Assel mill

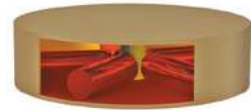
1 Incoming inspection of billets



2 Billet breaking, visual inspection



3 Billet heating in rotary furnaces



4 Billet centering



5 Billet piercing



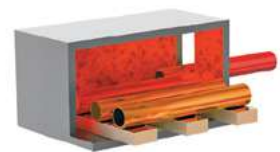
6 Shell rolling into pipes on Assel mills



7 Mandrel removal



8 Pipe heating in a walking beam furnace



9a Final pipe sizing in a three-roll sizing mill



9b Pipe reduction in a 12-stand reducing-sizing mill



10 Pipe cooling



11 Heat treatment of pipe in pusher furnaces (for bearing tubes and pipes for machinery)



12 Pipe straightening in a straightener



13 Pipe end trimming and edge facing



14 Quality control, turning (for bearing tubes)



15 Pipe cutting to length, quality control

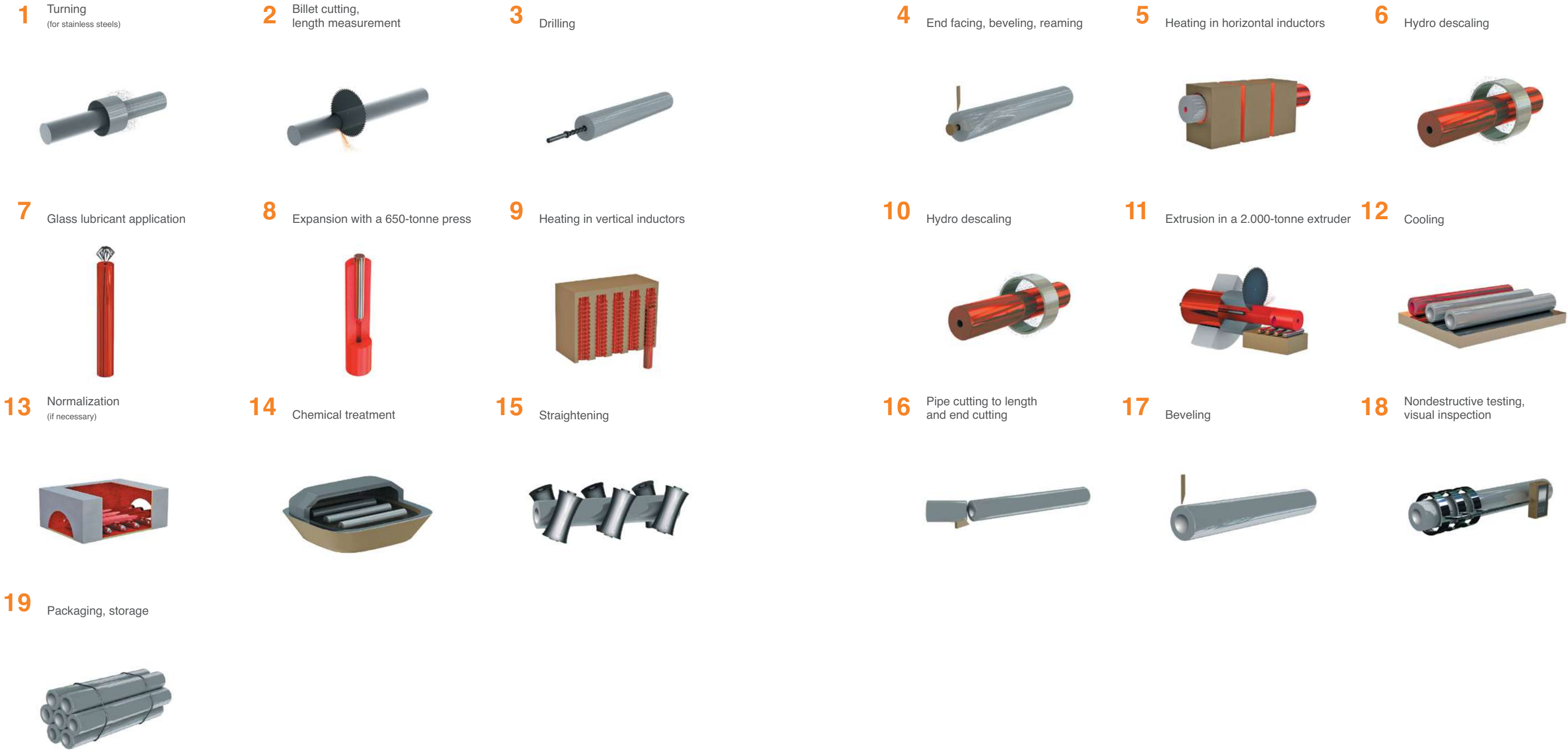


16 Packaging, storage



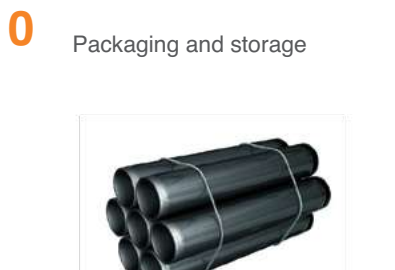
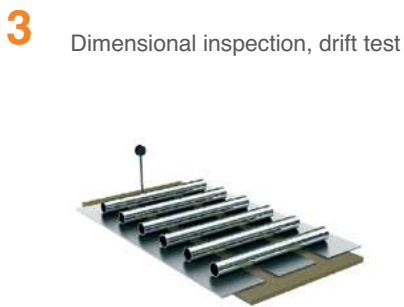
Seamless pipes

Manufactured by hot extrusion in a 2.000-tonne line

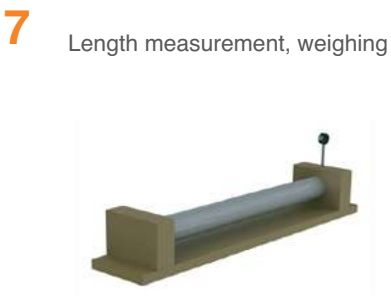
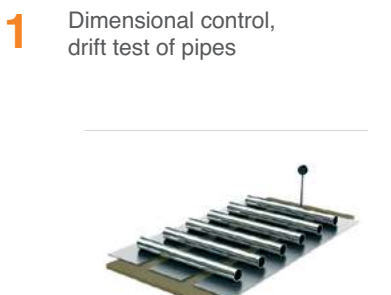


Casing

- 1 Heat treatment
(if necessary)
- a) Heating
b) Quenching
c) Tempering
d) Sizing
e) Straightening



Premium threading



Tubing



Manufacture of drill pipes with weld-on tool joints



Oil and gas line pipes (seamless)



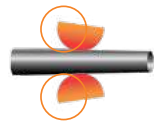
General purpose cold-formed pipes

1 Green pipe storage



2 Pipe cold-forming process
The manufacturing process and the number of passes in each operation depend on the green pipes size, as well as the size and required mechanical properties of finished pipes

Rolling on cold pilgers



Drawing with a mandrel



Drawing without a mandrel



3 Chemical treatment



4 Heat treatment



5 Straightening



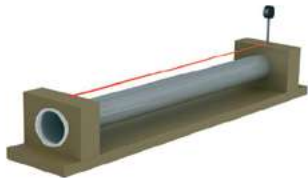
6 Mechanical testing



7 Cutting to length



8 Dimensional inspection



9 Surface inspection



10 Nondestructive testing
(if necessary)



11 Steel grade control



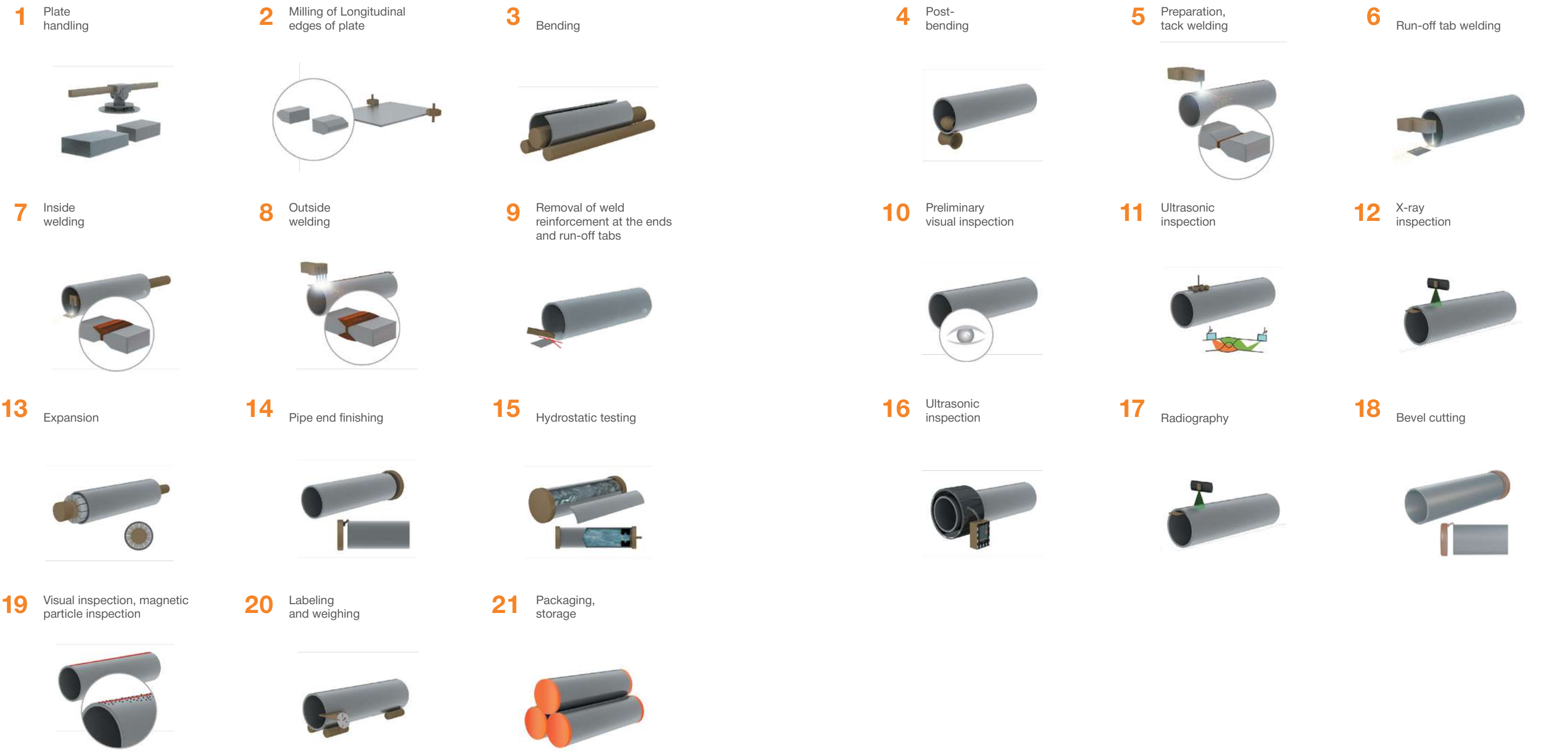
12 Length measurement, weighing



13 Labeling, anti-corrosion protection
(rust-preventive protection)



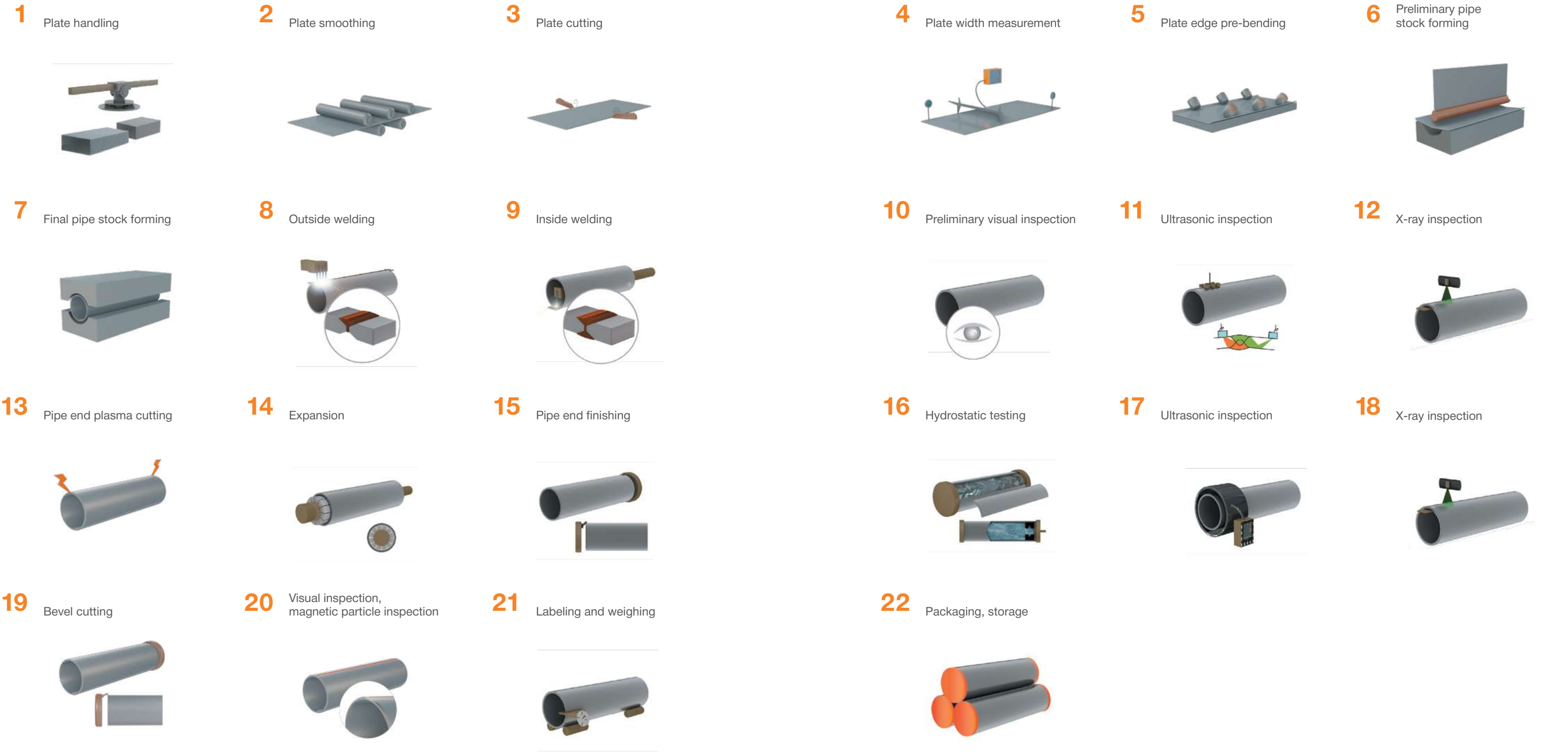
SAWL pipe production process (TMK PS, Volzhsky)



SAWL pipe production process
("Vysota 239", TMK PS, Chelyabinsk)



SAWL pipe production process at 530-820 mm
pipe mill (TMK PS, Chelyabinsk)



SAWL pipe production process at 1020-1220 mm pipe mill (TMK PS, Chelyabinsk)



Electric-welded pipes

Small- and medium-diameter pipes manufactured by TESA 73-219 (electric-weld pipes facility)

1

Strip storage



2

Strip preparation



3

Strip forming



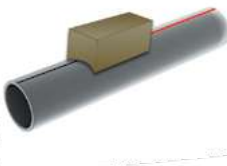
4

Pipe welding



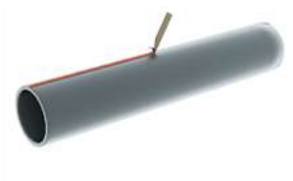
5

Local heat treatment of the welded joint



6

External and internal flash removal



7

Cooling, sizing and straightening of continuous pipe



8

Nondestructive testing of welded joint (flaw detection)



9

Cutting to length, end trimming



10

Pipe end machining



11

Hydrostatic testing



12

Pipe inspection and weighing



13

Packaging, storage



Electric-welded pipes

Medium-diameter pipes manufactured by TESA 168-530 (TMK-CPW)

1

Strip preparation



2

Edge trimming



3

Strip forming



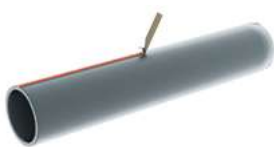
4

High-frequency welding



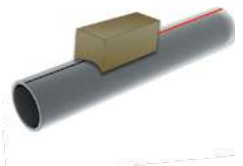
5

External and internal flash removal



6

Heat treatment of the weld seam



7

Cooling, sizing and straightening of continuous pipes



8

Saw cutting to length



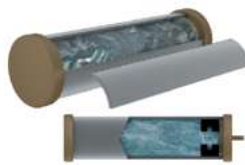
9

Pipe end finishing



10

Hydrostatic testing



11

Nondestructive testing of the welded joint



12

Visual inspection, dimensional control, labeling of pipes



13

Packaging, storage



External anti-corrosion coating



Internal anti-corrosion flow coating



Seamless pipes

Standard	Steel grade (pipes grade)	Mass fraction of elements, %									
		C max	Si	Mn	S	P	Cu	Ni	Cr	Al	V
		range			max						
GOST 1050-88	10A	0.07-0.14	0.17-0.37	0.35-0.65	0.02	0.02	0.3	0.3	0.25		
GOST 1050-88	20	0.17-0.24	0.17-0.37	0.35-0.65	0.040	0.035	0.25	0.25	0.25	0.050	
GOST 1050-88	20A	0.17-0.24	0.17-0.37	0.35-0.65	0.02	0.02	0.3	0.3	0.25		
GOST 4543-71	20Kh	0.17-0.23	0.17-0.37	0.50-0.80	Max 0.025	Max 0.025	0.30	0.30	0.70-1.00		
GOST 4543-71	40Kh	0.36-0.44	0.17-0.37	0.50-0.80	Max 0.025	Max 0.025	0.30	0.30	0.80-1.10		
GOST 4543-71	30KhPSA	0.28-0.34	0.90-1.2	0.80-1.10	Max 0.025	Max 0.025	0.30	0.30	0.80-1.10		
GOST 19281	09G2S	0.12	0.50-0.80	1.30-1.70	0.035	0.040	0.30	0.30	0.30		
API* Spec 5L/ISO 3183	(B) (X42) (X46–X80)	0.27		1.15	0.030	0.030					
		0.29		1.25	0.030	0.030					
		0.26		1.35	0.030	0.030					
TU 14-3-1128-2000	09G2S	0.12	0.50-0.80	1.30-1.70	0.010	0.025	0.30	0.30	0.30		
GOST 632-80	D	0.40-0.50	0.17-0.37	0.70-1.00	0.045	0.045					
GOST 632-80	32G2A (Ye)	0.29-0.36	0.20-0.35	1.15-1.45	0.020	0.020	0.30	0.30	0.30		–
GOST 632-80	L	0.28-0.35	0.17-0.37	1.10-1.40	0.035	0.035					0.02-0.06
GOST 632-80	M	0.28-0.35	0.17-0.37	1.10-1.40	0.035	0.035					0.06-0.12
GOST 632-80	R	0.28-0.35	0.17-0.35	1.35-1.55	0.025	0.025					0.07-0.10

Content of elements not listed in the table:
TU 1381-214-0147016-02. steel 20F: nitrogen 0.01
TU 1308-226-0147016-02. steel 13KhFA: nitrogen 0.008

TU 1381-159-0147016-01. steel 09GSF: nitrogen 0.012
TU 1381-204-0147016-01. steel 09GSF and 12GF: niobium 0.02-0.06

Welded pipes according to GOST 10704/10706

Standard	Steel grade	Mass fraction of elements, %									
		C	Mn	Si	P	S	Cr	Ni	Cu	As	N
		max									
GOST 380-2005	St1kp	0.06-0.12	0.25-0.50	Max 0.05	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St1Sp	0.06-0.12	0.25-0.50	0.15-0.30	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St2kp	0.09-0.15	0.25-0.50	Max 0.05	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St2ps	0.09-0.15	0.25-0.50	0.05-0.15	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St2sp	0.09-0.15	0.25-0.50	0.15-0.30	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St3kp	0.14-0.22	0.30-0.60	Max 0.05	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St3ps	0.14-0.22	0.40-0.65	0.05-0.15	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	St3sp	0.14-0.22	0.40-0.65	0.15-0.30	0.04	0.05	0.3	0.3	0.3	0.1	0.01
	08Yu	Max 0.07	Max 0.35	Max 0.03	Max 0.020	Max 0.025					
	08kp	0.05-0.12	0.25-0.50	Max 0.03	0.035	0.04	0.1	0.3	0.3	0.1	0.01
GOST 1050-88	08ps	0.05-0.11	0.35-0.65	0.05-0.17	0.035	0.04	0.1	0.3	0.3	0.1	0.01
	08	0.05-0.12	0.35-0.65	0.17-0.37	0.035	0.04	0.1	0.3	0.3	0.1	0.01
	10kp	0.07-0.14	0.25-0.50	Max 0.07	0.035	0.04	0.15	0.3	0.3	0.1	0.01
	Yups	0.07-0.14	0.35-0.65	0.05-0.17	0.035	0.04	0.15	0.3	0.3	0.1	0.01
	10	0.07-0.14	0.35-0.65	0.17-0.37	0.035	0.04	0.15	0.3	0.3	0.1	0.01
	15	0.12-0.19	0.35-0.65	0.17-0.37	0.035	0.04	0.25	0.3	0.3		
	20	0.17-0.24	0.25-0.50	0.17-0.37	0.035	0.04	0.25	0.3	0.3		
GOST 19281-89	16GS	0.12-0.18	0.9-1.2	0.4-0.7	0.035	0.04	0.3	0.3	0.3		
TU 14-1-2551-76	08G2SF	Max 0.12	1.2-1.6	0.4-0.6	0.025	0.01					

Bearing tubes according to GOST 800-78

Steel grade	Mass fraction of elements, %								
	C	Si	Mn	Cr	S	P	Cu	Ni	Ni + Cu
	max								
ShKh-15	0.95-1.05	0.17-0.37	0.20-0.40	1.30-1.65	0.020	0.027	0.25	0.30	0.50
ShKh-15 SG	0.95-1.05	0.40-0.65	0.90-1.20	1.30-1.65	0.020	0.027	0.25	0.30	0.50
ShKh-4	0.95-1.05	0.15-0.30	0.15-0.30	0.35-0.50	0.020	0.027	0.25	0.30	0.50

Seamless pipes for the oil refining and petrochemical industries (petroleum cracking pipes) according to GOST 550-75

Steel grade	Mass fraction of elements, %										
	C	Si	Mn	Cr	S	P	Ni	Cu	Mo	V	Ti
	max								max		
10	0.07-0.14	0.35-0.65	0.17-0.37	Max 0.15	0.040	0.035	0.30	0.30	–	–	–
20	0.17-0.24	0.35-0.65	0.17-0.37	Max 0.25	0.025	0.030	0.30	0.30	–	–	–
10G2	0.07-0.15	1.20-1.60	0.17-0.37	Max 0.30	0.035	0.035	0.30	0.30	–	–	–
12KhM	0.09-0.16	0.40-0.70	0.17-0.37	0.40-0.70	0.025	0.030	0.30	0.20	0.40-0.60		
15Kh5	Max 0.15	Max 0.50	Max 0.50	4.50-6.00	0.025	0.030	–	–	–	–	–
15Kh5M	Max 0.15	0.30-0.50	0.30-0.50	4.50-6.00	0.025	0.030	0.60	0.20	0.45-0.60	0.050	0.030
12Kh8	Max 0.12	0.010	0.17-0.37	7.5-9.0	0.030	0.035	0.40	0.25	–	–	–

Seamless corrosion-resistant steel pipes (stainless steel pipes)

Steel grade (alloy)	Mass fraction of elements, %													Groups*			
	C	Si	Mn	Cr	Ni	Ti	Al	W	Mo	Nb	V	Fe	S	P	I	II	III
													max				
Steels																	
40Kh9S2	0.35-0.45	2.0-3.0	Max 0.8	8.0-10.0	–	–	–	–	–	–	–	Basic metal	0.025	0.025	–	0	0
20Kh13	0.16-0.25	Max 0.8	Max 0.8	12.0-14.0	–	–	–	–	–	–	–	Basic metal	0.025	0.02 5	0	–	
25Kh13N2	0.20-0.30	Max 0.5	0.8-1.2	12.0-14.0	1.5-2.0	–	–	–	–	–	–	Basic metal	0.025	0.025	0	–	–
08Kh17T	Max 0.08	Max 0.8	Max 0.8	16.0-18.0	–	5C-0.80	–	–	–	–	–	Basic metal	0.025	0.02 5	0	0	–
15Kh26T	Max 0.15	Max 1.0	Max 0.8	24.0-27.0	–	5C-0.90	–	–	–	–	–	Basic metal	0.025	0.025	0	0	
08Kh17N5M3	0.06-0.10	Max 0.8	Max 0.8	16.0-17.5	4.5-5.5	–	–	–	3.0-3.5	–	–	Basic metal	0.020	0.020	0	–	–
08Kh17N6T	Max 0.08	Max 0.8	Max 0.8	16.0-18.0	5.5-6.5	–	–	–	Boron	Max 0.003	–	Basic metal	0.020	0.020	0	–	–
08Kh10N20T2	Max 0.08	Max 0.8	Max 2.0	10.0-12.0	18.0-20.0	1.5-2.5	Max 1.0	–	–	–	–	Basic metal	0.030	0.030	0	–	–
09Kh14N16B	0.07-0.12	Max 0.6	1.0-2.0	13.0-15.0	14.0-17.0	–	–	–	–	0.9-1.3	–	Basic metal	0.020	0.020	–	0	0
17Kh18N9	0.13-0.21	Max 0.8	Max 2.0	17.0-19.0	8.0-10.0	–	–	–	–	–	–	Basic metal	0.020	0.020	0	–	–
08Kh18N10T	Max 0.08	Max 0.8	Max 1.5	17.0-19.0	10.0-11.0	5C-0.6	N 0.05	–	–	–	–	Basic metal	0.020	0.020	0	0	–
08Kh18N10	Max 0.08	Max 0.8	Max 2.0	17.0-19.0	9.0-11.0	–	–	–	–	–	–	Basic metal	0.020	0.020	0	0	–
07Kh15N4M2T-PT	0.05-0.1	Max 0.60	0.2-0.7	14.0-16.0	3.5-4.5	0.15-1.35	0.2 + Cu 0.2	–	1.5-2.0	–	–	Basic metal	0.02	0.02			
06Kh18N11	Max 0.03	Max 0.4	Max 0.4	17.0-19.0	11.5-13.0	Max 0.005	–	–	–	–	1.4-1.7	Basic metal	0.020	0.020	0	–	–
Alloys																	
KhN35VT	Max 0.12	Max 0.6	1.0-2.0	14.0-16.0	34.0-38.0	1.1-1.5	–	2.8-3.5	–	–	–	Basic metal	0.020	0.030	–	–	0
20Kh23N18	Max 0.20	Max 1.0	Max 2.0	22.0-25.0	17.0-20.0	–	–	–	–	–	–	Basic metal	0.020	0.035	–	0	0
KhN70Yu	Max 1.0	Max 0.8	Max 0.3	26.0-29.0	Basic metal	–	2.80-3.50	–	–	–	–	Max 1.0	0.012	0.015	–	0	0
Kh70MFV	Max 0.02	Max 0.10	Max 0.5	Max 0.3	Basic metal	Max 1.5	–	0.10-0.45	25.0-27.0	–	1.4-1.7	Max 0.8	0.012	0.015	0	–	–
KhN55VMTKYu	0.04-0.10	Max 0.5	Max 0.5	9.0-12.0	Basic metal	1.4-2.0	3.6-4.5	4.5-6.5	4.0-6.0	–	0.2-0.8	Max 5.0	0.010	0.015	–	–	0
KhN65MVU	Max 0.02	Max 0.10	Max 1.0	14.5-16.5	Basic metal	–	–	3.0-4.5	15.0-17.0	–	–	Max 0.5	0.012	0.015	0	–	–

* Groups I – corrosion-resistant, II – heat resistant, III – creep resistant.
Pipes can be made of steel grades not listed in the table within limits set out in GOST 5632-72 (12Kh18N10T, 10Kh7N13M2T, 4S33-VN and others).

Seamless pipes for the thermal power industry (pipes for power generation)

Steel grade	Mass fraction of elements, %										
	C	Si	Mn	Cr	Ni	Mo	V	Other			
									max		
TU 14-ZR-55-2001											
20	0.17-0.24	0.17-0.37	0.35-0.65	Max 0.25	Max 0.25	—	—	—	0.30	0.025	0.030
15GS	0.12-0.18	0.70-1.00	0.90-1.30	Max 0.30	Max 0.30	—	—	—	0.30	0.025	0.035
15KhM	0.10-0.15	0.17-0.37	0.40-0.70	0.80-1.10	Max 0.25	0.40-0.55	—	—	0.20	0.025	0.035
12Kh1MF	0.10-0.15	0.17-0.37	0.40-0.70	0.90-1.20	Max 0.25	0.25-0.3 5	0.15-0.30	—	0.20	0.025	0.025
15Kh1M1F	0.10-0.15	0.17-0.37	0.40-0.70	1.10-1.40	Max 0.25	0.90-1.10	0.20-0.35	—	0.25	0.025	0.025
10Kh9MFB-Sh	0.08-0.12	Max 0.50	0.30-0.60	8.60-10.00	Max 0.70	0.60-0.80	0.10-0.20	Nb 0.1–0.2	0.3	0.015	0.03
12Kh2MFSR	0.08-0.15	0/40-0.70	0.40-0.70	1.60-1.90	Max 0.25	0.50-0.70	0.20-0.35	B 0.002-0.005	0.25	0.025	0.025
12Kh11V2MF	0.09-0.14	Max 0.50	0.50-0.80	10.0-12.0	Max 0.60	0.60-0.90	0.15-0.30	W 1.17–2.20	0.30	0.025	0.025
12Kh18N12T	Max 0.12	Max 0.80	1.00-2.00	17.0-19.0	11.0-13.0	—	—	(C – 0.02)x5 max 0.70	0.30	0.020	0.035
10Kh13G12BS2N2D2	0.06-0.10	1.80-2.20	12.00-13.50	11.50-13.00	1.80-2.50	—	—	Nb 0.6–1.0	2.0-2.5	0.020	0.030
DIN 17175; EN 10216-2											
St 3 5.8	0.17	0.10-0.3 5	0.40-0.80	—	—	—	—	—	—	0.04	0.04
St 45.8	0.21	0.10-0.35	0.40-0.80	—	—	—	—	—	—	0.04	0.04
17MP4	0.14-0.20	0.20-0.40	0.90-1.20	0.3	—	—	—	—	—	0.04	0.04
19MP5	0.17-0.22	0.30-0.60	1.00-1.30	0.3	—	—	—	—	—	0.04	0.04
15Mo3	0.12-0.20	0.10-0.3 5	0.40-0.80	—	—	0.25-0.3 5	—	—	—	0.035	0.035
13CrMo44	0.10-0.18	0.10-0.35	0.40-0.70	0.70-1.10	—	0.45-0.65	—	—	—	0.035	0.035
ASTM A106/A106M											
Grade A	0.25	0.10	0.27-0.93	0.40	0.40	0.15	0.08	—	0.40	0.048	0.058
Grade B	0.30	0.10	0.29-1.06	0.40	0.40	0.15	0.08	—	0.40	0.048	0.058
Grade C	0.35	0.10	0.29-1.06	0.40	0.40	0.15	0.08	—	0.40	0.048	0.058

API* - Effective March 17, 2022, the API Monogram/APIQR Program has ceased offering certification services within the Russian Federation in response to restrictions on financial and business activities imposed by the U.S. and Russian governments. As a result, now all TMK facilities are not authorized to apply the API Monogram on their products.

TMK facilities were holding API license continuously for over 25 years. They have vast experience of manufacturing material in accordance with API standards to the clients worldwide. Since 2003, the TMK facilities have produced more than 3 million metric tons of casing, tubing, drilling and linepipes as per API Standards and marked with the API monogram.

TMK product's quality and reliability are demonstrated by years of supply and service customers.

However, now the TMK facilities are still permitted to state that their products meet or comply with an API standard or specification provided that they do meet the requirements in the API standard or specification. As previously, the TMK facilities guarantee full compliance with the requirements of the API Standards and the quality of supplied products.

To provide additional confidence to our clients, in the summer of 2022 the TMK facilities have been audited by AJA Registrars CIS ltd. and found to be in accordance with requirements API Spec. 5CT, API Spec. 5L, API Spec. 5DP & API Spec. Q1.

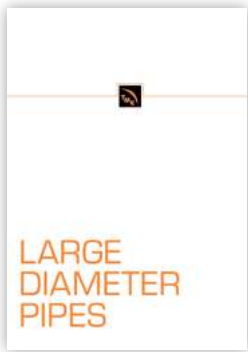
During a manufacturing of customer orders a third part inspection can be involved to re-assure that all material is produced in strict accordance with API Standards and customer specifications. A utilization of third part testing laboratories can be provided as well.

CONTACTS

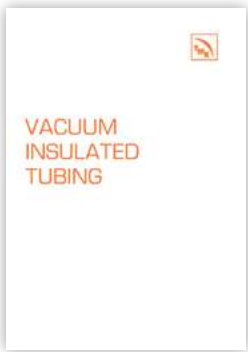


COMMERCIAL
CONTACTS

PRODUCT CATALOGS OF TMK GROUP



Large Diameter
Pipes



Insulated tubing
(vacuum (VIT)
and non-vacuum)



Stainless Steel
Pipes



Premium connections
TMK UP

