TMK ETERNO INTEGRATED ENGINEERING SOLUTIONS

TMK is a leading supplier of steel piping, piping solutions and supporting services for different sectors of the economy. TMK produces ready-cut piping, including special pipes and other products for the energy, chemical, mechanical engineering, construction and other sectors. The company has wide-ranging expertise in the mechanical engineering sector, provides engineering solutions for power generation and metallurgical facilities and is developing a new line of products for the hydrogen energy sector.

TMK combines production sites and sales offices in Russia and abroad. It also owns several oil services companies, which together form its subsidiary TMK Neftegazservis. In addition to supplying its products, the company also provides a wide range of services in relation to the selection of piping products and the custom development of new designs, as well as supporting services including warehousing and pipe repair.

TMK is constantly uprading its scientific and technological skill base and is implementing advanced solutions with the support of an R&D center in Moscow and the Russian Research Institute of the Pipe Industry (RusNITI) in Chelyabinsk. The company is able to provide a full cycle of advanced piping solutions, from the initial concept development to testing and the launch of production.

TMK ETERNO

The management company of TMK's Machine-Building Division.

TMK ETERNO offers integrated solutions to design and manufacture unique products for vertically integrated oil and gas companies, operators of gas and oil transportation systems, machine-building, power-generating, and steelmaking enterprises.

Advanced manufacturing technologies used at TMK ETERNO and its vast expertise in design are a guarantee of consistently high quality of all the company's products.

The management company TMK ETERNO is located in Moscow, production enterprises are in the Chelyabinsk and Belgorod regions.

Contents

01.

Pipeline fittings

The plants' products are intended for trunk and gathering pipelines, process piping of pump and compressor stations as well as other facilities in the oil, gas, and nuclear industries, and the housing and utilities sector. The product range includes die-stamped, die-stamped and welded, welded, and bent pipeline fittings:

- Elbows for smoothly bending pipelines in the required direction
- Tees for branch pipelines
- Fittings for pipeline sealing
- Reducers for connecting pipelines with different diameters

The production facilities feature state-of-the-art equipment and unique technological advantages which ensure world-class product quality standards and fulfillment of individual orders in line with the requirements of a specific project with minimal delivery times.

ELBOWS

Product range

Bend type	Nominal diameter DN, mm	Bend radius, mm	Bend angle, °	Wall thickness, mm
HFC bends, hot induction bends	150–1,400	375–10,000	1–90	8–50
Cold bends, cold bending pipes	50–200 400–1,400	15,000–60,000	1–30	9–25.8
Short radius elbows, long radius elbows, elbows	40–800	1–2 DN	30; 45; 60; 90	2.5–36
Welded elbows	500–1,400	1.5 DN	30; 45; 60; 90	12–60

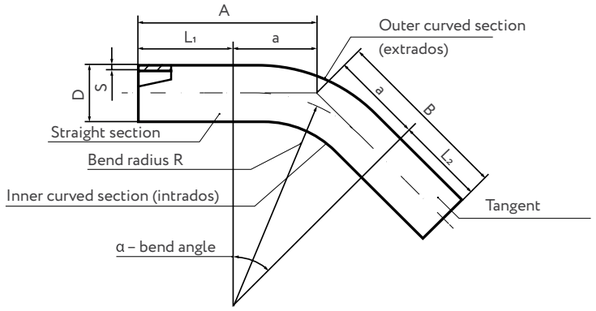
INTENDED USE:

Smooth change of pipeline direction

Hot induction bends

FEATURES

Bends manufactured by induction heating of the annular pipe cross-section are intended for bending trunk and gathering pipelines and use in process piping, and pump and compressor stations transporting gas, oil, petroleum products, or other media.



OD – outside diameter; S – wall thickness; R – bend radius; a – construction length of the bent section; L, L1 – tangent length; A, B – construction lengths. The bends are manufactured with bend angles from 1° to 90° with 1° increments. By agreement with the customer, bends with straight sections of any length can be manufactured.

Standards

Standard	Application
TC 1469-014-74238272-2009	Gathering pipelines with an operating pressure of up to 32 MPa
TC 1469-015-74238272-2008	Trunk gas pipelines with an operating pressure of up to 11.8 MPa and gathering pipelines with an operating pressure of up to 16 MPa
TC 1469-025-74238272-2011	Trunk and gathering oil and gas pipelines for the construction sites of underwater crossings and subsea transportation pipelines with an operating pressure of up to 32 MPa
TC 1469-034-74238272-2012	Bends with increased operational reliability and cold resistance in corrosive media intended for oil field development
TC 1469-035-74238272-2012	Line sections of gas pipelines and compressor station (CS) pipelines with an operating pressure of up to 11.8 MPa
TC 1469-037-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from – 40 °C to +120 °C. Category I bends are intended for use at an operating pressure of up to 32.0 MPa with a nominal diameter of up to DN 300, inclusive, for use at an operating pressure of up to 24.0 MPa with a nominal diameter of DN 400, and for use at an operating pressure of up to 10.0 MPa with nominal diameters from DN 500 to DN 1400. Category II bends with nominal diameters from DN 500 to DN 1400 are intended for use at an operating pressure exceeding 10.0 MPa up to 11.8 MPa

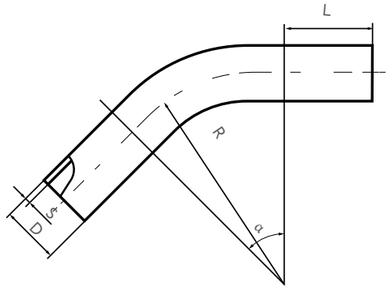
Standards (continued)

Standard	Application
TC 1469-038-74238272-2014	Transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a wall temperature from –40 °C to +120 °C with a bend radius of 1.5 DN, with a diameter of up to DN 400 with an operating pressure of up to 17 MPa, diameters from DN 500 TO DN 1200 with an operating pressure of up to 10 MPa, andDN 1400 with an operating pressure of up to 7.5 MPa
TC 1469-039-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 159 mm to 426 mm with an operating pressure of up to 9.8 MPa, inclusive, supplied for construction, repair, and retrofit
TC 1469-040-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 530 mm to 1,220 mm with an operating pressure of up to 11.8 MPa, intended for construction, repair, and retrofit
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements
TC 14-1-5598-2011	Gathering pipelines with an operating pressure of up to 25 MPa when used in aggressive environments
ASME B16.49	Factory-made, wrought steel, butt-welding induction bends for transportation and distribution systems
EN 14870-1	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 1: Induction bends
ISO 15590-1	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 1: Induction bends

Cold bends

FEATURES

Bends are used to change the direction of the linear section of steel trunk pipelines or their branches in a vertical or horizontal plane. They are made of steel seamless or longitudinal welded (with one or two longitudinal seams) pipes, including with external anti-corrosion coating that retains its technical properties within the admissible ranges after cold bending.



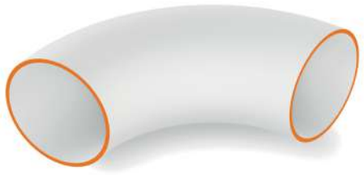
Standards

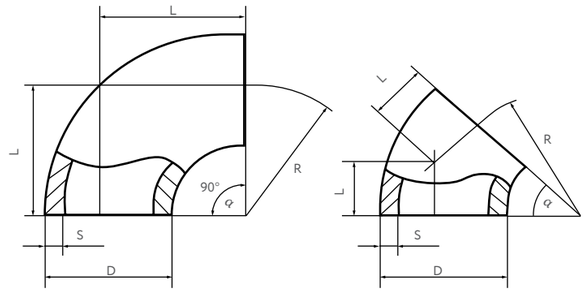
Standard	Application
GOST 24950-2019	Trunk pipelines and branch pipelines
TC 14-1-5598-2011	Gathering, inter-field, and intra-site pipelines used in aggressive environments
TC 1469-029-74238272-2013	Construction, repair, and retrofit of trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, inclusive
TC 1469-037-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from – 40 °C to +120 °C with an operating pressure of up to 32 MPa
TC 1469-026-74238272-2011	Trunk oil pipelines, construction of underwater crossings and subsea transportation pipelines with an operating pressure of up to 10.0 MPa, inclusive
TC 1469-023-74238272-2011	Trunk gas pipelines with an operating pressure of up to 11.8 MPa and gathering gas pipelines with an operating pressure of up to 16.0 MPa
TC 1469-034-74238272-2012	Bends with increased operational reliability and cold resistance in corrosive media intended for oil field development
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements

Elbows

FEATURES

Sharply curved die-stamped bends, including those manufactured by hot drawing on a horn-shaped mandrel from seamless and electric-welded pipes, are intended for bending trunk and gathering pipelines and use in process piping, and pump and compressor stations transporting gas, oil, petroleum products, or other media.





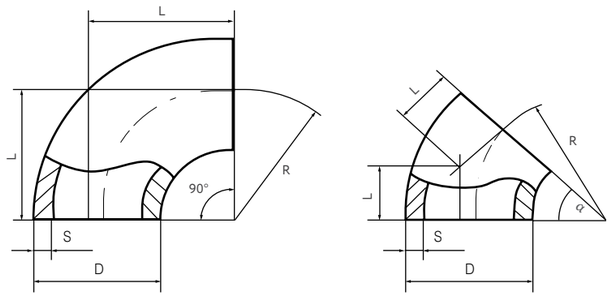
Standards

Standard	Application
GOST 30753-2001, type 2D (R = 1 DN)	Pipelines intended for various purposes, including those controlled by supervisory authorities, with an operating pressure of up to 16 MPa
TC 1468-010-01394863-99, type 2D (R = 1 DN)	Pipelines intended for various purposes, including those controlled by supervisory authorities
GOST 17375-2001, type 3D (R = 1.5 DN)	Pipelines intended for various purposes, including those controlled by supervisory authorities, with an operating pressure of up to 16 MPa and temperatures from –70 °C to +450 °C
TC 1469-027-74238272-2011	Trunk oil and petroleum product pipelines transporting oil with an operating pressure of up to 14.0 MPa, inclusive, with diameters from 530 mm to 820 mm and trunk and process oil and petroleum product pipelines with an operating pressure of up to 9.8 MPa with diameters from 159 mm to 426 mm
TC 1469-009-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from - 40 °C to +120 °C
TC 1469-039-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 159 mm to 426 mm with an operating pressure of up to 9.8 MPa, inclusive, supplied for construction, repair, and retrofit
TC 1469-040-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 530 mm to 1,220 mm with an operating pressure of up to 11.8 MPa, intended for construction, repair, and retrofit
TC 1469-034-74238272-2012	Pipelines for oil field development for use in corrosive media with an operating pressure of up to 32 MPa
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements
ASME B16.9	Factory-made wrought butt-welding fittings
ASME B16.11	Forged fittings, socket-welding and threaded
MSS SP-75	High-strength, wrought, butt-welding fittings
EN 14870-2	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
ISO 15590-2	Petroleum and natural gas industries – Factory bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
EN 10253-1	Butt-welding pipe fittings – Part 1: Wrought carbon steel for general use and without specific inspection requirements
EN 10253-2	Butt-welding pipe fittings – Part 2: Non alloy and ferritic alloy steels with specific inspection requirements
EN 10253-3	Butt-welding pipe fittings – Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements
EN 10253-4	Butt-welding pipe fittings – Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements

Welded elbows

FEATURES

Sharply curved bends with a bend radius of up to 1.5 DN, manufactured by submerged arc welding from two die-stamped halves.



Standards

Standard	Application
TC 1469-001-32551486-2015	Trunk and gathering pipelines with an operating pressure of up to 11.8 MPa for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons
TC 1469-002-32551486-2014	Trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, transporting non-corrosive oil and petroleum products
TC 1469-003- 32551486-2015	Trunk and gathering pipelines transporting non-corrosive gas, oil, and petroleum products, including stable condensate with an operating pressure of up to 9.8 MPa (100 kgf/cm^2)
TC 1469-004-32551486-2015	Connection elements with increased operational reliability and cold resistance for oil and gas field development with an operating pressure of up to 32 MPa, inclusive
TC 1469-005-32551486-2015	Trunk gas pipelines with an operating pressure of 11.8 MPa
TC 24.20.40-012-32551486-2019	Connection elements with diameters from DN 200 TO DN 1400 FOR gathering and trunk pipelines with an operating pressure of up to 32 MPa
TC 24.20.40-021-32551486-2019	Connection elements
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes
TC 24.20.40-019-32551486-2021	Connection elements (bends, tees, reducers, heads (blanks), transition rings) of grades K48–K60 with a nominal diameter of up to DN 1200 made of carbon and low- alloy steels intended for construction, retrofit, and repair of gathering pipelines
ASME B16.9	Factory-made wrought butt-welding fittings
MSS SP-75	High-strength, wrought, butt-welding fittings
EN 14870-2	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
ISO 15590-2	Petroleum and natural gas industries – Factory bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
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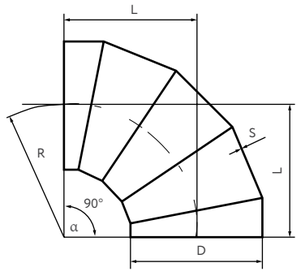
Products can be manufactured in accordance with other standards or in line with individual customer requirements upon agreement with TMK's technical services.

Miter bends

FEATURES

Miter bends are manufactured by welding sectors and/or half-sectors with a bend radius from 1.0 DN and more.



Standards

Standard	Application
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes

REDUCERS

BY MODIFICATION:

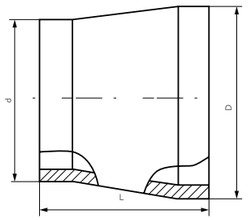
- Concentric (a, c)
- Eccentric (b, d)

BY THE PRESENCE OF A STRAIGHT SECTION:

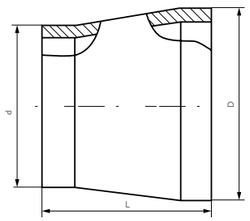
- Reducers with a shoulder stop (a, b)
- Reducers without a shoulder stop (c, d)

FEATURES

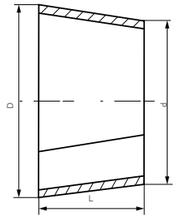
Smooth change of pipeline diameter



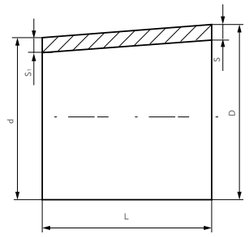
A



B



C



D

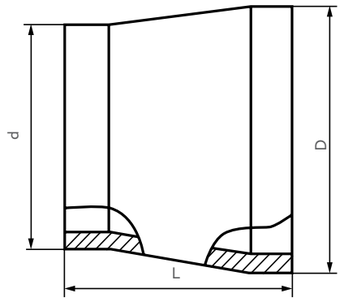
Product range

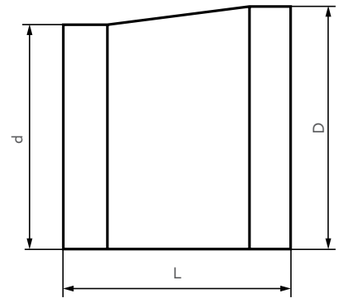
Reducer type	Letter code	Nominal diameter DN, mm		Wall thickness, mm	
		Larger	Smaller	Larger diameter	Smaller diameter
Die-stamped	PSh, PShK, PShE	40–500	25–400	2–28	1.6–26
Die-stamped and welded	PShS	500–1,400	400–1,200	12–60	12–60

Reducers seamless

FEATURES

Reducers are used in the construction and retrofit of pipelines to connect pipes of different diameters.





Standards

Standard	Application
GOST 17378-2001	Pipelines intended for various purposes, including those controlled by supervisory authorities, with an operating pressure of up to 16 MPa and temperatures from –70 °C to +450 °C
TC 1469-027-74238272-2011	Trunk oil and petroleum product pipelines with a diameter of 530 mm, transporting oil with an operating pressure of up to 14.0 MPa, inclusive, with diameters from 159 mm to 426 mm and trunk and process oil and petroleum product pipelines with an operating pressure of up to 9.8 MPa
TC 1469-009-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from –40 °C to +120 °C
TC 1469-039-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 159 mm to 426 mm with an operating pressure of up to 9.8 MPa, inclusive, supplied for construction, repair, and retrofit
TC 1469-040-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 530 mm to 1,220 mm with an operating pressure of up to 11.8 MPa, intended for construction, repair, and retrofit
TC 1469-034-74238272-2012	Pipelines for oil field development for use in corrosive media with an operating pressure of up to 32 MPa
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements
ASME B16.9	Factory-made wrought butt-welding fittings
MSS SP-75	High-strength, wrought, butt-welding fittings
EN 14870-2	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
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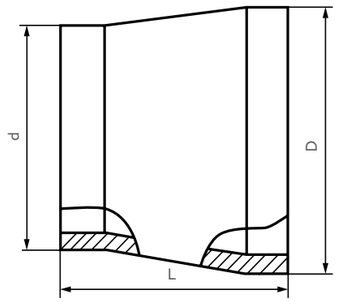
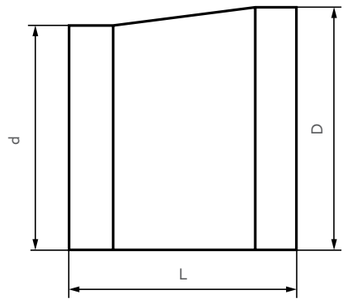
Reducers welded

Reducers are used in the construction and retrofit of pipelines to connect pipes of different diameters.





Standards

Standard	Application
TC 1469-001-32551486-2015	Trunk and gathering pipelines with an operating pressure of up to 11.8 MPa for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons
TC 1469-002-32551486-2014	Trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, transporting non-corrosive oil and petroleum products
TC 1469-003-32551486-2015	Trunk and gathering pipelines transporting non-corrosive gas, oil, and petroleum products, including stable condensate with an operating pressure of up to 9.8 MPa (100 kgf/cm2)
TC 1469-004-32551486-2015	Connection elements with increased operational reliability and cold resistance for oil and gas field development with an operating pressure of up to 32 MPa, inclusive
TC 1469-005-32551486-2015	Trunk gas pipelines with an operating pressure of 11.8 MPa
TC 24.20.40-012-32551486-2019	Connection elements with diameters from DN 200 TO DN 1400 FOR gathering and trunk pipelines with an operating pressure of up to 32 MPa
TC 24.20.40-021-32551486-2019	Connection elements
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes
TC 24.20.40-019-32551486-2021	The present technical specifications apply to connection elements (bends, tees, reducers, heads (blanks), transition rings) of grades K48–K60 with a nominal diameter of up to DN 1200 made of carbon and low-alloy steels intended for construction, retrofit, and repair of gathering pipelines
ASME B16.9	Factory-made wrought butt-welding fittings
MSS SP-75	High-strength, wrought, butt-welding fittings
EN 14870-2	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
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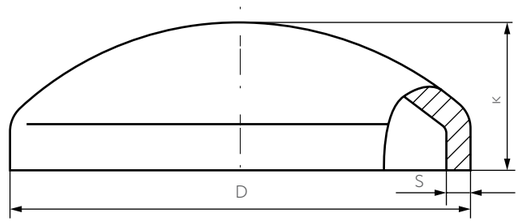
CAPS

INTENDED USE:

Pipeline sealing



Product range

Part type	Letter code	Nominal diameter, mm	Wall thickness, mm
Caps	DSh	50–1,400	3–46
Blanks	DSh	50–500	3–16
Heads	DSh	500–3,600	10–48

Standards

Standard	Application
GOST 17379-2001	Pipelines intended for various purposes, including those controlled by supervisory authorities, with an operating pressure of up to 16 MPa and temperatures from –70 °C to +450 °C
TC 1469-009-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from – 40 °C to +120 °C
TC 1469-027-74238272-2011	Trunk oil and petroleum product pipelines with a diameter of 530 mm, transporting oil with an operating pressure of up to 14.0 MPa, inclusive, with diameters from 159 mm to 426 mm and trunk and process oil and petroleum product pipelines with an operating pressure of up to 9.8 MPa
TC 1469-039-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 159 mm to 426 mm with an operating pressure of up to 9.8 MPa, inclusive, supplied for construction, repair, and retrofit
TC 1469-040-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 530 mm to 1,220 mm with an operating pressure of up to 11.8 MPa, intended for construction, repair, and retrofit
TC 1469-034-74238272-2012	Pipelines for oil field development for use in corrosive media with an operating pressure of up to 32 MPa
TC 1469-001-32551486-2015	Trunk and gathering pipelines with an operating pressure of up to 11.8 MPa for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons
TC 1469-002-32551486-2014	Trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, transporting non-corrosive oil and petroleum products
TC 1469-003-32551486-2015	Trunk and gathering pipelines transporting non-corrosive gas, oil, and petroleum products, including stable condensate with an operating pressure of up to 9.8 MPa (100 kgf/cm2)
TC 1469-004-32551486-2015	Connection elements with increased operational reliability and cold resistance for oil and gas field development with an operating pressure of up to 32 MPa, inclusive
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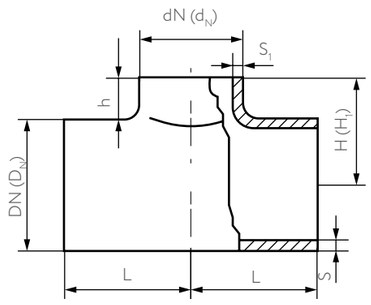
TC 24.20.40-021-32551486-2019	Connection elements
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements

TEES

INTENDED USE:

Connection of branches to trunk pipelines.



Product range

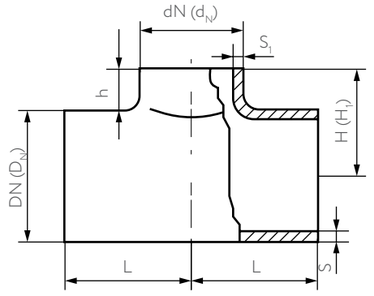
Tee type	Letter code	Nominal diameter, mm		Wall thickness, mm	
		Trunklines	Branches	Trunklines	Branches
Die-stamped and welded	TShS	500–1,400	150–1,400	14–100	8–76
Welded	TS	300–1,200	300–1,200	10–48	8–38

At the customer's request, a guide grid is welded to the tee outlet.

Standards

Standard	Application
TC 1469-001-32551486-2015	Trunk and gathering pipelines with an operating pressure of up to 11.8 MPa for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons
TC 1469-002-32551486-2014	Trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, transporting non-corrosive oil and petroleum products
TC 1469-003-32551486-2015	Trunk and gathering pipelines transporting non-corrosive gas, oil, and petroleum products, including stable condensate with an operating pressure of up to 9.8 MPa (100 kgf/cm2)
TC 1469-004-32551486-2015	Connection elements with increased operational reliability and cold resistance for oil and gas field development with an operating pressure of up to 32 MPa, inclusive
TC 1469-005-32551486-2015	Trunk gas pipelines with an operating pressure of 11.8 MPa
TC 24.20.40-012-32551486-2019	Connection elements with diameters from DN 200 TO DN 1400 FOR gathering and trunk pipelines with an operating pressure of up to 32 MPa
TC 24.20.40-021-32551486-2019	Connection elements
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes
TC 24.20.40-019-32551486-2021	The present technical specifications apply to connection elements (bends, tees, reducers, heads (blanks), transition rings) of grades K48–K60 with a nominal diameter of up to DN 1200 made of carbon and low-alloy steels intended for construction, retrofit, and repair of gathering pipelines
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements

Tees welded



INTENDED USE:

Welded tees are made from a shell with a single weld seam resulting from stamping.

Standards

Standard	Application
ASME B16.9	Factory-made wrought butt-welding fittings
MSS SP-75	High-strength, wrought, butt-welding fittings
EN 14870-2	Petroleum and natural gas industries – Induction bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
ISO 15590-2	Petroleum and natural gas industries – Factory bends, fittings, and flanges for pipeline transportation systems – Part 2: Fittings
EN 10253-1	Butt-welding pipe fittings – Part 1: Wrought carbon steel for general use and without specific inspection requirements
EN 10253-2	Butt-welding pipe fittings – Part 2: Non alloy and ferritic alloy steels with specific inspection requirements
EN 10253-3	Butt-welding pipe fittings – Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements
EN 10253-4	Butt-welding pipe fittings – Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements

Key product parameters according to standards

Standard	Diameter range D, mm (inch)*	Nominal diameter DN, mm
ASME B16.9	508–1,219.2 (20"–48")	500–1,200
MSS SP-75; EN 14870-2; ISO 15590-2; EN 10253-1-4	508–1,422 (18"–56")	500–1,400

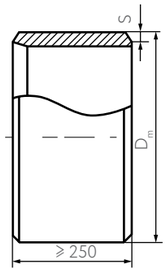
* The range of tee sizes by trunkline diameter is indicated.

Standard	Trunkline diameter		Branch diameter	
	Nominal diameter DN, mm	Outside diameter D, mm	Nominal diameter DN, mm	Outside diameter D, mm
TC 1469-001-32551486-2015	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220
	1,400	1,420	150–1,400	159–1,420
TC 1469-002-32551486-2014	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,000	1,067	150–1,000	159–1,067
	1,200	1,220	150–1,200	159–1,220
TC 1469-003-32551486-2015	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220
	1,400	1,420	150–1,400	159–1,420

Key product parameters according to standards (continued)

Standard	Trunkline diameter		Branch diameter	
	Nominal diameter DN, mm	Outside diameter D, mm	Nominal diameter DN, mm	Outside diameter D, mm
TC 1469-004- 32551486-2015	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220
TC 1469-005- 32551486-2015	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220
	1,400	1,420	150–1,400	159–1,420
TC 24.20.40-012-32551486-2019	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220
	1,400	1,420	150–1,400	159–1,420
TC 24.20.40-021-32551486-2019	500	530	150–500	159–530
	600	630	150–600	159–630
	700	720	150–700	159–720
	800	820	150–800	159–820
	1,000	1,020	150–1,000	159–1,020
	1,200	1,220	150–1,200	159–1,220

TRANSITION RINGS



INTENDED USE:

Connection of fittings and pipes with different wall thicknesses or different diameters

PRODUCT RANGE

Part type	Letter code	Nominal diameter, mm	Wall thickness, mm
Ring	KP	57–3,600	4–80

Standards

Standard	Application
TC 14-1-5598-2011	Gathering pipelines with an operating pressure of up to 25 MPa when used in aggressive environments
TC 1469-015-74238272-08	Trunk gas pipelines with an operating pressure of up to 11.8 MPa and gathering pipelines with an operating pressure of up to 16 MPa
TC 1469-027-74238272-2011	Trunk oil and petroleum product pipelines transporting oil with an operating pressure of up to 14.0 MPa, inclusive, with diameters from 530 mm to 820 mm and trunk and process oil and petroleum product pipelines with an operating pressure of up to 9.8 MPa with diameters from 159 mm to 426 mm
TC 1469-034-74238272-2012	Pipelines for oil field development for use in corrosive media with an operating pressure of up to 32 MPa
TC 1469-035-74238272-2012	Line sections of gas pipelines and compressor station (CS) pipelines with an operating pressure of up to 11.8 MPa
TC 1469-037-74238272-2014	Trunk and gathering pipelines for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons at a pipeline wall temperature from –40 °C to +120 °C. Category I rings are intended for use at an operating pressure of up to 32.0 MPa with a nominal diameter of up to DN 500, inclusive, and for use at an operating pressure of up to 10.0 MPa with a nominal diameter of up to DN 1400, inclusive. Category II rings with nominal diameters from DN 500 to DN 1400. inclusive, are intended for use at an operating pressure exceeding 10.0 MPa
TC 1469-039-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 159 mm to 426 mm with an operating pressure of up to 9.8 MPa, inclusive, supplied for construction, repair, and retrofit
TC 1469-040-74238272-2014	Trunk and process oil and petroleum product pipelines with diameters from 530 mm to 1,220 mm with an operating pressure of up to 11.8 MPa, intended for construction, repair, and retrofit

Standards (continued)

Standard	Application
TC 1469-001-32551486-2015	Trunk and gathering pipelines with an operating pressure of up to 11.8 MPa for the transportation of gaseous (natural gas) or liquid (oil and petroleum products) hydrocarbons
TC 1469-002-32551486-2014	Trunk oil and petroleum product pipelines with an operating pressure of up to 11.8 MPa, transporting non-corrosive oil and petroleum products
TC 1469-003-32551486-2015	Trunk and gathering pipelines transporting non-corrosive gas, oil, and petroleum products, including stable condensate with an operating pressure of up to 9.8 MPa (100 kgf/cm2)
TC 1469-004-32551486-2015	Connection elements with increased operational reliability and cold resistance for oil and gas field development with an operating pressure of up to 32 MPa, inclusive
TC 1469-005-32551486-2015	Trunk gas pipelines with an operating pressure of 11.8 MPa
TC 24.20.40-012-32551486-2019	Connection elements with diameters from DN 200 TO DN 1400 FOR gathering and trunk pipelines with an operating pressure of up to 32 MPa
TC 24.20.40-021-32551486-2019	Connection elements
TC 24.20.40-017-32551486-2018	Connection elements, pipeline assemblies, and electric-welded pipes
TC 24.20.40-019-32551486-2021	The present technical specifications apply to connection elements (bends, tees, reducers, heads (blanks), transition rings) of grades K48–K60 with a nominal diameter of up to DN 1200 made of carbon and low-alloy steels intended for construction, retrofit, and repair of gathering pipelines
TC 24.20.40.000-044-74238272-2020	Connection elements, pipeline assemblies, and electric-welded steel pipes with a nominal diameter of up to DN 3600, with an operating pressure of up to 11.8 MPa
TC 24.20.40.000-052-74238272-2019	Connection elements
ASME B16.11	Forged fittings, socket-welding and threaded
MSS SP-97	Integrally reinforced forged branch outlet fittings: socket welding, threaded, and buttwelding ends

EXTERNAL COATINGS

INTENDED USE:

Protection of pipes, pipeline fittings, and equipment from the transported medium and external environment

PRODUCT RANGE:

TMK ETERNO applies the following types of coatings:

- External polyurethane coating
- External epoxy coating
- Internal epoxy coating
- External weather-proof coating

List of key product standards

Standard	Application
TC 24.20.40-003-74238272-2021	Connection elements and assembly units with external anti-corrosion coatings for trunk and gathering pipelines
TC 2313-004-74238272-2005	Thermosetting external coatings for connection elements, pipes, pipeline assembly units, and mechanical process equipment
TC 24.20.13-049-74238272-2017	Products with anti-corrosion coatings based on epoxy, polyurethane, and weather-proof materials
TC 24.20.13-057-74238272-2021	External and internal coatings for pipes and connection elements
TC 24.20.13-060-74238272-2017	Connection elements and units with external protective coatings
EN 10290	Steel tubes and fittings for onshore and offshore pipelines – External liquid applied polyurethane and polyurethane-modified coatings
EN 10301	Steel tubes and fittings for on and offshore pipelines – Internal coatings for the reduction of friction for conveyance of non-corrosive gas

Key product parameters according to standards

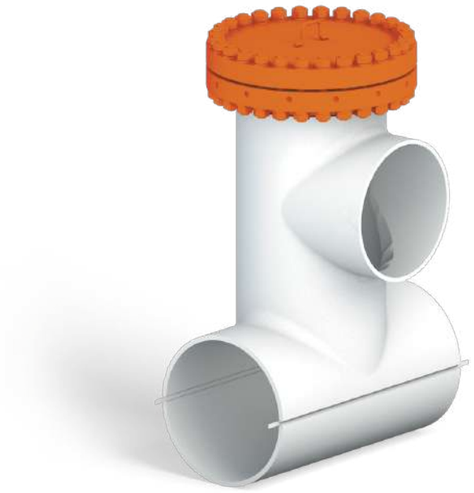
Standard	Outside diameter D, mm	Coating types	Operating temperature	Property
TC 1469-003-74238272-2014	57–1,420	Pk-40	from –20 °C to +40 °C	External thermosetting coating
		Pk-60	from –20 °C to +60 °C	
		Pk-80	from –20 °C to +80 °C	
TC 2313-004-74238272-2005	57–1,220	Pk-40	from –40 °C to +40 °C	External thermosetting coating
		Pk-60	from –40 °C to +60 °C	
		Pk-80	from –40 °C to +80 °C	
		M Pk-40	from –50 °C to +40 °C	External thermosetting cold-resistant coating
		M Pk-60	from –50 °C to +60 °C	
		M Pk-80	from –50 °C to +80 °C	
TC 24.20.13-049-74238272-2017*	57–1,420	(1N)*	from –50 °C to +60 °C	External weather-proof coating
		1EP-60	from –50 °C to +60 °C	External single-layer epoxy coating
		1EP-80 (13N)*	from –60 °C to +80 °C	
		2EP-80 (8N)*	from –60 °C to +80 °C	External two-layer epoxy coating
		1 PU-40	from –40 °C to +40 °C	External single-layer polyurethane coating
		1 PU-60	from –40 °C to +60 °C	
		1 PU-80 (14N)*	from –40 °C to +80 °C	
		1 PU-40 (M)	from –50 °C to +40 °C	External single-layer polyurethane cold-resistant coating
		1 PU-60 (M)	from –50 °C to +60 °C	
		1 PU-80 (M)	from –50 °C to +80 °C	
TC 24.20.13-057-74238272-2021**	57–1,420	EP-N	from –40 °C to +80 °C	External single-layer epoxy coating
	273–1,420	EP-V	from –40 °C to +80 °C	Internal epoxy coating
	57–1,420	Pk-40-N	from –40 °C to +40 °C	External polyurethane coating
		Pk-60-N	from –40 °C to +60 °C	
		Pk-80-N	from –40 °C to +80 °C	
		M Pk-40-N	from –50 °C to +40 °C	External polyurethane cold-resistant coating
		M Pk-60-N	from –50 °C to +60 °C	
		M Pk-80-N	from –50 °C to +80 °C	
		Atm-N	from –40 °C to +80 °C	External weather-proof paint coating
TC 24.20.13-060-74238272-2017***	57–820	E	from –60 °C to +80 °C	External single-layer epoxy coating
	920–1,420			External two-layer epoxy coating
	57–1,420	PU60	from –60 °C to +60 °C	External single-layer polyurethane coating
		PU80	from –60 °C to +80 °C	
EN 10290	57–1,420	Type 1	from –20 °C to +40 °C	External single-layer polyurethane coating
		Type 2	from –20 °C to +60 °C	
		Type 3	from –20 °C to +80 °C	
EN 10301	57–1,420	-	from –20 °C to +110 °C	Internal single-layer epoxy coating

* Developed in accordance with MUK No. P4-06.03 M-0111, the code in brackets is as per MUK No. P4-06.03.

** Developed in accordance with MU.01.27.

*** Developed in accordance with TTT-01.02.04-02

SPLIT TEES



up to DN 1400, inclusive

8 - 100 mm

GRADE:
K34 (X56)–K60 (X65)

Split tees welded under pressure on pipelines with an operating pressure of up to 10.0 MPa, inclusive, transporting hydrocarbons (natural gas), liquid hydrocarbons (oil and petroleum products), stable and unstable condensate, and natural gas liquids are used for connection to an operating pipeline or tank.

TMK ETERNO manufactures the following modifications of split tees in cooperation with other companies according to TU 1469-010-32551486-2016:

- Welded
- Welded with a lateral branch
- Flanged
- Flanged with a lateral branch

SUPPORTS (MOVABLE, FIXED)

A structural element that protects the pipe from damage at the point of contact with the support structure and serves to keep the pipeline in its design position. Supports are used to absorb loads acting on the pipeline and transfer them to building structures. In some cases, supports are used to eliminate vibrations and to control forces and stresses in the pipeline.

Fixed supports

from 108 mm to 1,420 mm

Movable supports

from 108 mm to 1,420 mm

02.

Valves

Our products meet the strictest requirements of consumers and can operate in various climates and service environments. When developing each product, we focus on its functionality:

- Increased operational reliability under hydraulic or aerodynamic pressure
- High-strength materials used
- Necessary structural rigidity

Product quality is verified throughout the process: from inspection of incoming feedstocks and components to pressure tests on test benches and in operating environments.

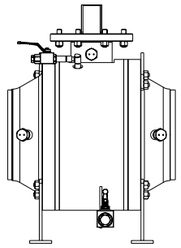
Our Quality Management System is certified to EN ISO 9001:2008, EN ISO 14001:2004, and API* Spec Q1. The plant has successfully launched the manufacturing of products to international standards such as:

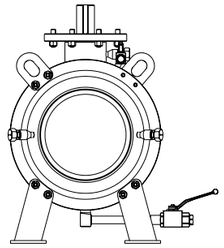
ASME / ANSI	B 16.5; B 16.10; B 16.25; B 16.34; B 16.37; ASME Sections V.; VIII., and IX.
API*	SPEC 6A; SPEC 6D; SPEC 5L; SPEC 6FA; std 607; std 598
MSS	SP 6; SP 25; SP 53; SP 54; SP 72
BS	1560; 2080; 5146; 5351; 6755 part 2
ASTM	Materials specifications
ISO	5211m; EN 10 204; NACE MR-01-75
DIN	1690; 2505; 2544-48; 2526; 2526; 3203; 3230; 3840; materials specifications
ČSN	13 3060; 38 6410; materials specifications

Cutting-edge technology and professional development expertise enable us to manufacture products supporting maximum operating pressures to tap into large-diameter trunk pipelines.

BALL VALVES

The valves are designed to shut off the medium with a set seat leakage rate and are installed on pipelines transporting various media, including aggressive ones. Applications include the thermal energy, chemical, petrochemical, oil refining, gas, and other industries.





Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
K 83 TW welded body ball valve	PN 16–420 (class 150–2500)	DN 50–1400	from –60 °C up to +200 °C	flanged or welded	gas, crude oil, aggressive media, water
K 83 TB bolted ball valve	PN 16–420 (class 150–2500)	DN 50–1400	from –50 °C up to +200 °C	flanged or welded	gas, crude oil, aggressive media, water
K 89 metal-to-metal seated ball valve	PN 16–420 (class 150–600)	DN 50–1400	from –50 °C up to +550 °C	flanged or welded	high-temperature and abrasive environments
K 78 top-entry ball valve	PN 16–250 (class 150–1500)	DN 50–600	from –50 °C up to +550 °C	flanged or welded	high-temperature and abrasive environments

For K83 and K89, the entire range of DN 50–1400 has a confirmed pressure rating up to PN 160, with other size classes provided at individual requests.

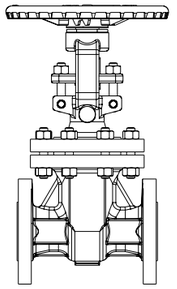
Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 28.14.13–021–54634853–2018, API* Spec 6D	PN 1.0–40.0 MPa (class ANSI 150-2500)	DN 10-1200	from –60 °C to +250 °C, metal/polymer or metal/elastomer seated from –60 °C to +450 °C, metal-to-metal seated	flanged or welded	Natural gas and other gaseous, explosive, or flammable media. Water, steam. Crude oil, petroleum products, and other explosive liquids; methanol; water-methanol solution; water, gas, and petroleum mix; hydrocarbon condensate
TC 3742–017–54634853–2015	PN 1.6–10.0 MPa	DN 300-1200	up to +60 °C	flanged or welded	crude oil and petroleum products
TC 3742-013-54634853-2013 STO 2-4.1-212-2008	PN 1.6–16.0 MPa	DN 50-1200	from –60 °C to +250 °C	flanged or welded	Natural gas and other gaseous, explosive, or flammable media. Water, steam. Crude oil, petroleum products, and other explosive liquids; methanol; water-methanol solution; water, gas, and petroleum mix; hydrocarbon condensate

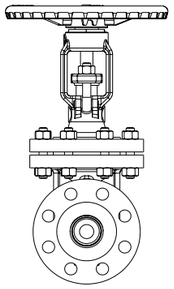
Control, and on-off and control ball valves

The valves are designed to operate as control or on-off and control devices as part of automated process control systems (pressure, flow rate, temperature, etc.) on the line sections of oil and petroleum product pipelines, at the output side of trunk pipeline booster stations, and in process systems of pumping stations.

Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3742-014-54634853-2013 OTT-75.180.00-KTN-179-16	PN 1.6–12.5 MPa	DN 50–800	from –20 °C up to +60 °C	flanged or welded	commercial oil, petroleum products

ATE VALVES





Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
C 09.2 gate valve	PN 16–250 (class 150–1500)	DN 15–1400 (NPS ½"–56")	from –46 °C up to +538 °C	flanged or welded	water, saturated steam, air, crude oil and petroleum products, non-aggressive media
S 38 gate valve	PN 16–100	DN 50–1200	from –46 °C up to +538 °C	flanged or welded	water, saturated steam, air, crude oil and petroleum products, non-aggressive media
S 38.4 inside screw gate valve	PN 100	DN 250–300	from –46 °C up to +538 °C	flanged or welded	water, gas
S 42 high-pressure gate valve with a pressure-seal bonnet	PN 160–400	DN 65/50–400/300	from –20 °C up to +575 °C	flanged or welded	water, saturated steam, air, non-aggressive media
S 85.1 slab gate valve	PN 16–160	DN 300–1200	from –60 °C up to +50 °C	flanged or welded	crude oil and petroleum products
S 85.2 welded body slab gate valve	PN 16–50	DN 300–1200	from –60 °C to +80 °C	flanged or welded	crude oil and petroleum products

To fully shut off the fluid flow in trunk pipelines. At the customer's request, gate valves are supplied with a pressure tap to measure pressure from the gate valve's pup joints as well as with a remote leak monitoring device.

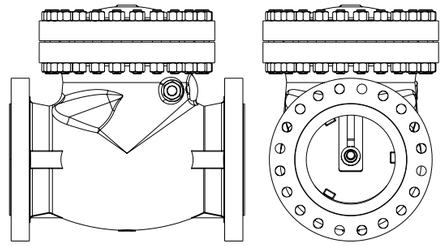
Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3741-005-54634853-2009 (OTT-23.060.30- KTN-108-15), TC 3741-015-54634853-2014 (MUK ETT No. P4-06 M-0066)	PN 1.6–10.0 MPa	DN 50–800	from –60 °C up to +80 °C	flanged or welded	oil and gas fluids, associated petroleum and natural gas, commercial oil and petroleum products, water (fresh, produced water, bottom water, rainwater, and domestic sewage)

Outside screw wedge gate valves

The gate valves are designed to fully shut off the medium flow in trunk pipelines or at thermal energy, chemical, petrochemical, oil refining, or gas industry facilities.

Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3741-001-54634853-2002 (OTT-23.060.30-KTN-135-16, OTT-75.180.00-KTN-164-10)	PN 1.6–16.0 MPa	DN 50–1000	from –15 °C to +350 °C	flanged or welded, mixed	commercial oil, petroleum products, water, steam, foam solutions, seawater
TC 3741-003-54634853-2008 (MUK ETT No. P1-01.05 M-0082, STO 2- 4.1-212-2008) TC 3741-023-54634853-2016	PN 1.6–25.0 MPa	DN 50–1000	from –60 °C to +565 °C	flanged or welded	water, steam, crude oil, liquid and gaseous petroleum products, natural gas, foam solutions, liquids and gases neutral to the materials of medium-contacting fittings, as well as media containing hydrogen sulfide (H_2S) and carbon dioxide (CO_2)
Wrought steel gate valves TC 3741-003-54634853-2008 TC 3741-023-54634853-2016	PN 1.6–16.0 MPa	DN 15–40	from –60 °C to +565 °C	flanged or welded, threaded coupling, welded coupling	water, steam, crude oil, liquid and gaseous petroleum products, natural gas, foam solutions, and other liquids and gases neutral to the materials of medium-contacting fittings.

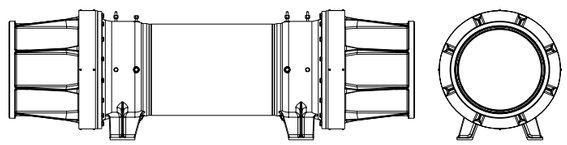
GLOBE VALVES



Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
C 09.1 on-off valve	PN 16–100 (class 150–600)	DN 50–350 (NPS ½"–14")	from –60 °C up to +575 °C	flanged or welded	water, saturated steam, air, crude oil and petroleum products, non-aggressive media
C 09 check valve	PN 16–100 (class 150–600)	DN 15–700 (NPS ½"–28")	from –46 °C up to +575 °C	flanged or welded	water, saturated steam, air, crude oil and petroleum products, non-aggressive media
C 09.4 check valve (as per API* 6d)	PN 16–250 (class 150–1500)	DN 15–300 (NPS ½"–12")	from –46 °C up to +575 °C	flanged	water, saturated steam, air, crude oil and petroleum products, non-aggressive media
L 10 127 check valve*	PN 160–400	DN 65/50–300/225	from –20 °C up to +575 °C	welded	water, saturated steam, air, non-aggressive media

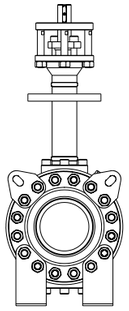
* Flanged modifications are available by agreement with the customer.

EXPANSION JOINTS



Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
M 14 one-sided expansion joint	PN 25	DN 200–1200	from –60 °C to +200 °C	welded	water, saturated steam, non-aggressive media
M 17 two-sided expansion joint	PN 25	DN 200–1200	from –60 °C to +200 °C	welded	water, saturated steam, non-aggressive media

CRYOGENIC ON-OFF VALVES



Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
K 88	PN 16–160 (class 150–900)	DN 15–750	from –196 °C to +50 °C	flanged or welded	liquefied gas
C.09.2	PN 16–250 (class 150–1500)	DN 15–300 (NPS ½"–12")	from –196 °C to +50 °C	flanged or welded	liquefied gas
C 09.1	PN 16–100 (class 150–600)	DN 15–350 (NPS ½"–14")	from –196 °C to +50 °C	flanged or welded	liquefied gas

These on-off valves are used in process lines at LNG production and regasification facilities.

Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3742-025-54634853-2016	PN 1.6–10.0 MPa	DN 15–1000	from –196 °C to +65 °C	flanged or welded	liquefied natural gas, liquefied and gaseous hydrocarbons (ethane, propane, butane, and other natural gas separation and distillation products)

ON-OFF VALVES TIGHT Y-SHAPED

These globe valves are used to ensure straight medium flow, prevent excessive turbulence, and fully shut off medium flow in process pipelines at the thermal energy, chemical, petrochemical, oil refining, and gas industry facilities.

Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3742-004-54634853-2009, the globe valve's design complies with BS 1873	PN 1.6–42.0 MPa (ANSI Class 150–2500)	DN 15–400	from –60 °C up to +565 °C	flanged or welded	water, steam, crude oil, gas, liquid and gaseous petroleum products, petroleum gases, chemical media

CONTROL, AND SHUT-OFF AND PRESSURE RELIEF SAFETY VALVES

Designed to protect oil and petroleum product trunk pipelines against hydraulic shocks or excessive pressure.

Product	Operating pressure	Nominal diameter DN,mm	Operating temperature	Connection type	Operating medium
TC 3742-009-54634853-2012, OTT- 75.180.00-KTN-175-16	PN 4.0–8.0 MPa	DN 100–400	from –45 °C to +80 °C	flanged or welded	commercial oil and petroleum products (gasoline, diesel fuel, kerosene)

WELLHEAD EQUIPMENT

Flowing and injection (gas lift) wellhead assemblies and Christmas trees

Designed to contain pressure in production and injection wells, as well as to monitor and control operation during production or injection of fluids or gas into the formation.

Product	Operating pressure	Nominal diameters	Corrosion-resistant modification	Shell materials class	Product specification level	Performance requirements	Operating medium
TC 28.99.39–011–54634853–2018, API* Spec 6A	14.0–105.0 MPa (2,000–15,000 psi)	50–150 (2 1/16”–7 1/16”)	K1, K2 as per GOST 13846-89	AA, BB, CC, DD, EE as per API* Spec 6A.	PSL1, PSL2, PSL3, PSL3G as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	PR1 or PR2 as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	crude oil, gas, gas condensate

Unitized wellhead equipment

Designed to hook up service and casing strings as well as tubing in a single split body without reassembling the blowout preventer. Unitized wellhead equipment with protective ErNiCrMo-3 (Inconel 625), 06Kh15N60M15, or OKAutrod 309L (Kh25N13) coating against CO2 corrosion on the internal surface contacting the operating medium.

Product	Operating pressure	Corrosion-resistant modification	Shell materials class	Product specification level	Performance requirements	Operating medium
TC 28.99.39–011–54634853–2018, API* Spec 6A	35.0–105.0 MPa (5,000–15,000 psi)	K1 and K2 as per GOST 13846-89	AA, BB, CC, DD, EE as per API* Spec 6A	PSL1, PSL2, PSL3, PSL3G as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	PR1 or PR2 as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	crude oil, gas, gas condensate

Casing connections. Standard products: OKK1, OKK2, OKK3

Предназначены для обвязывания технических и обсадных колонн и контроля давления в межтрубном пространстве

Product	Operating pressure	Corrosion-resistant modification	Shell materials class	Product specification level	Performance requirements	Operating medium
TC 28.99.39–011–54634853–2018, API* Spec 6A	14.0–105.0 MPa (2,000–15,000 psi)	K1, K2 as per GOST 13846-89	AA, BB, CC, DD, EE as per API* Spec 6A	PSL1, PSL2, PSL3, PSL3G as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	PR1 or PR2 as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	crude oil, gas, gas condensate

Slab gate valves

Designed to be used as on-off valves in flowing and injection wellhead assemblies or pipelines to hook up wellheads and pumping equipment for hydrofracturing, workover cementing, sand washing, and acidizing.

Product	Operating pressure	Nominal diameters	Corrosion-resistant modification	Shell materials class	Product specification level	Performance requirements	Operating medium
TC 28.14.13-008-54634853-2018, API* Spec 6A	14.0–105.0 MPa (2,000–15,000 psi)	50–150 (2 1/16”–7 1/16”)	K1 and K2 as per GOST 13846-89	AA, BB, CC, DD, EE as per API* Spec 6A	PSL1, PSL2, PSL3, PSL3G as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	PR1 or PR2 as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	crude oil, gas, gas condensate

Adjustable throttles and non-adjustable nipples

Designed to support the well’s required daily production rate:

- Adjustable throttles to control the operating medium
- Non-adjustable nipples to maintain the set constant medium flow rate (pressure)

Product	Operating pressure	Nominal diameters	Corrosion-resistant modification	Shell materials class	Product specification level	Performance requirements	Operating medium
TC 28.99.39–011–54634853–2018, API* Spec 6A	14.0–105.0 MPa (2,000–15,000 psi)	(2,000–15,000 psi) 50–150 (2 1/16”–7 1/16”)	K1 and K2 as per GOST 13846-89	AA, BB, CC, DD, EE as per API* Spec 6A	PSL1, PSL2, PSL3, PSL3G as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	PR1 or PR2 as per GOST R 51365 (ISO 10423:2003) and API* Spec 6A	crude oil, gas, gas condensate

03.

Pipeline spools

The oil and gas industries currently place a great emphasis on improving recovery technologies while considerably cutting field development costs. In this context, the use of unitized modular equipment gains traction in the oil and gas industry. Unitized equipment saves time, labor, and investment resources while offering high performance and reliability.

A pipeline unit is a self-contained, fully prefabricated standalone assembly unit designed to support a specific process stage (chemical, heat exchange, hydrodynamic, mass exchange, etc.). A module is a part of a unit mounted on a standard skid and not exceeding the maximum transportation dimensions.

The TMK ETERNO division offers integrated solutions for oil and gas companies to design, manufacture, and deliver assemblies and modules for pipelines, pipeline units, unitized modular equipment, etc.

Process units include pipes, connection elements, on-off and control valves, metal structures manufactured in-house or by partners.

PIPELINE SPOOLS

INTENDED USE:

For use in unitized modular solutions (gas treatment facilities, gas distribution facilities, pumping stations, etc.) for transporting liquids and gases, including flammable and explosive ones.

PRODUCT RANGE

Product type	Nominal diameter, mm	Operating pressure, MPa
Pipeline unit	50–1,400	0–32 MPa

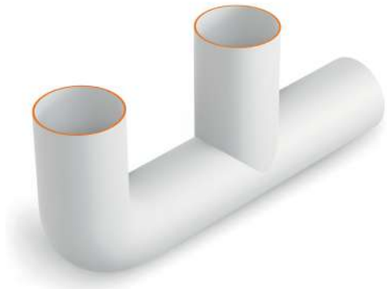
UNITS CAN INCLUDE:

- pipeline connection elements, flanges, pipe sections
- valves
- pumping units
- instrumentation, measurement, and automation devices
- electrical equipment.

UNITS CAN BE DESIGNED:

- on or without a special skid (frame), with the assembly's body used as a support for mounting other equipment, metal structures, pipeline connections, valves, and other items
- with an anti-corrosion coatings (external weather-proof, polyurethane foam, epoxy) and thermal insulation.

PIPELINE ASSEMBLIES



NTENDED USE:

Enlarged assemblies made of factory-made connection elements and pipe sections to boost pipeline construction and retrofit performance and reliability.

Standards

Standard	Application
TC 1469-012-74238272-2016	Trunk pipelines with an operating pressure of up to 11.8 MPa and gathering pipelines with an operating pressure of up to 32 MPa, transporting non- corrosive gaseous (naTCral gas) and liquid (stable gas condensate) hydrocarbons
TC 1469-016-74238272-2008	Trunk gas pipelines transporting non-aggressive media, with an operating pressure of 11.8 MPa, made of steel grades of up to K65
TC 1469-036-74238272-2012	Gas pipelines making part of assembly and equipment process piping, as well as line sections of gas pipelines with an operating pressure of up to 11.8 MPa
TC 3113-033-74238272-2012	Pipeline units for CHP plant's steam and hot water with an operating pressure of up to 37.27 MPa and a temperaTCre of up to 560 °C
TC 24.20.40-017-32551486-2018	Pipelines for miscellaneous purposes: trunk and gathering oil and gas pipelines, process pipelines, gas distribution system pipelines, pressure vessels, steam and hot water pipelines, tanks, etc., with a nominal diameter of up to DN 3600, an operating pressure of up to 32 MPa, and temperaTCres from –269 °C to +600 °C
TC 24.20.40.000-044-74238272-2020	

Products can be manufactured in accordance with project requirements based on the customer's designs.

04.

Solutions for the nuclear industry

TMK ETERNO offers solutions and services for nuclear power enterprises:

- Designing equipment for nuclear power plants
- Manufacture and delivery of pipelines (pipeline units and assembly components, support and suspension systems, on-off valves)
- Construction of process systems
- Engineering services
- Kitting and delivering pipelines and rolled products (low- and high-pressure power generation pipes, stainless steel pipes with improved surface quality, stainless steel pipes meeting extra requirements and additionally tested, shaped products for high- and low-pressure pipelines)

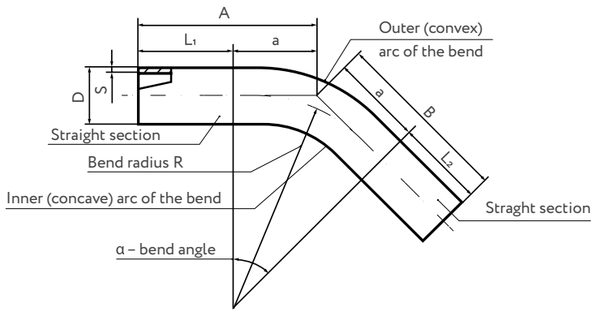
PIPELINE FITTINGS

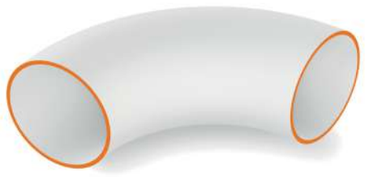
Bends

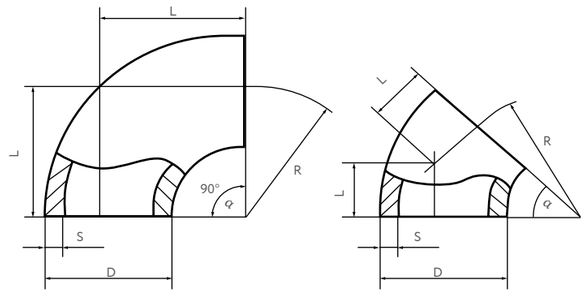
(cold, hot, sharply curved, die-stamped, including those manufactured by hot drawing on a horn-shaped mandrel from seamless or electric-welded pipes, as well as miter bends)

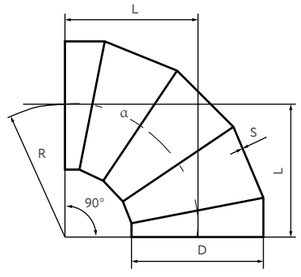
INTENDED USE

Smooth change of pipeline direction.









Product range

Bend type	Letter code	Nominal diameter DN, mm	Bend radius, mm	Bend angle, 0	Wall thickness, mm
Bent	OG	150–1,400	375–10,000	1–90	8–50
Cold-bent	GO	10–57	100–60,000	1–30	9–25.8
Sharply curved die-stamped	OKSh	40–800	1–2 DN	30; 45; 60; 90	2.5–36
Sharply curved die-stamped and welded	OKShS	500–1,400	1.5 DN	30; 45; 60; 90	12–60

FEATURES

Miter bends are manufactured by welding sectors and/or half-sectors with a bend radius of 1.0 DN or more.

Key product parameters

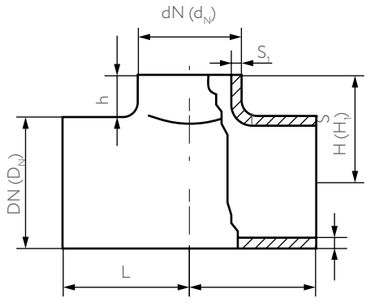
Standard	Outside diameter D, mm	Nominal diameter DN, mm	Bend radius R, mm	Bend length L, mm at the bend angle α, °			
				30°	45°	60°	90°
As per detailed design documentation	159; 168	150	225	60	93	130	225
	219	200	300	80	124	173	300
	273	250	375	100	155	216	375
	325	300	450	120	186	260	450
	377	350	525	141	217	303	525
	426	400	600	161	248	346	600
	530	500	750	201	311	433	750
	630	600	900	241	373	520	900
	720	700	1,000	268	414	577	1,000
	813; 820	800	1,200	321	497	693	1,200
	1,020; 1,067	1,000	1,500	402	621	866	1,500
	1,220	1,200	1,800	482	746	1,039	1,800
	1,420	1,400	2,100	562	870	1,212	2,100
	1,520	1,500	2,250	603	932	1,299	2,250
	1,620	1,600	2,400	643	994	1,386	2,400
	1,720	1,700	2,550	683	1,056	1,472	2,550
	1,820	1,800	2,700	723	1,118	1,558	2,700

1. Bends with a nominal diameter of up to DN 3600 can be manufactured.
2. Bends in size DN 1800 that are not specified in this table must be specified in design and/or process documents of the manufacturer.
3. By agreement with the customer, the company can manufacture other bend radiuses and angles or bend lengths of miter bends, as well as a different number of mitered sections (a different miter angle).

Tees

INTENDED USE:

Connection of lateral branches to trunk pipelines.



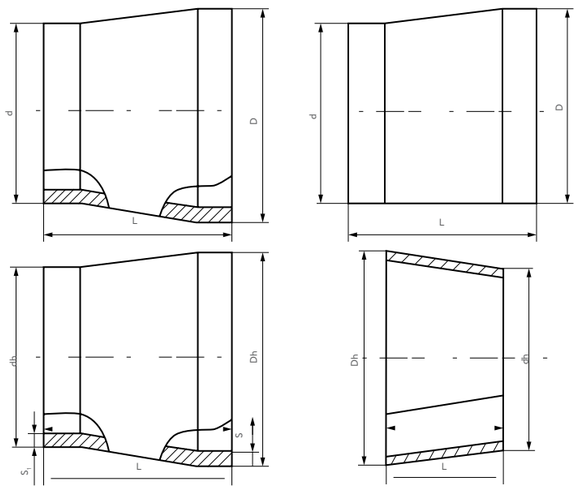
Standards

Standard	Intended use	Diameter, min/max, mm	Wall thickness, min/max, mm
OST 34-10-432-90 equivalent to STO 79814898 120-2014	Drilled equal tees	14–38	2–3
OST 34-10-433-90 equivalent to STO 79814898 121-2014	Reducing tees with a reinforced nipple	14–159	2–6
OST 34-10-510-90 equivalent to STO 79814898 124-2014	Welded equal tees	57–1,220	3–12
OST 34-10-511-90 equivalent to STO 79814898 125-2014	Welded reducing tees	32–108	2.5–5
OST 34-10-512-90 equivalent to STO 79814898 126-2014	Welded reducing tees with a reinforcement pad	377–1,220	6–10
OST 34-10-513-90 equivalent to STO 79814898 127-2014	Welded reducing tees with a reinforcement pad	108–1,020	5–10
OST 34-42-673-84	Turned equal tees	14–76	2–3
STO 95 124-2013	Turned equal tees	14–76	2–3
STO SRO-P 60542948 00021-2013	Turned equal tees	108–377	4–9
OST 34-42-674-84	Reducing tees with a reinforced nipple	108–1,620	2–14
STO 95 125-2013	Reducing tees with a reinforced nipple	76–1,420	3–14
STO SRO-P 60542948 00022-2013	Reducing tees with a reinforced nipple	32–219	2–5
OST 34-42-675-84	Welded equal tees	108–325	9–17
STO 95 126-2013	Welded equal tees	76–325	9–17
STO SRO-P 60542948 00023-2013	Welded equal tees	14–89	2–8
OST 34-42-676-84	Welded reducing tees	14–89	2–7
STO 95 127-2013	Welded reducing tees	89–325	5–20
STO SRO-P 60542948 00024-2013	Welded reducing tees	245–325	12–19
OST 34-42-677-84	Welded equal tees with a reinforcement pad	133–325	6–12
STO 95 128-2013	Welded equal tees with a reinforcement pad	16–76	2–4
STO SRO-P 60542948 00025-2013	Welded reducing tees with a reinforcement pad	108–630	8–28
OST 34-42-678-84	Welded reducing tees with a reinforcement pad	89–273	4–10
STO 95 129-2013	Welded reducing tees with a reinforcement pad	89–426	6–14

Reducers

INTENDED USE:

Gradual change of pipe diameter.



Standards

Standard	Intended use	Diameter, min/max, mm	Wall thickness, min/max, mm
OST 34-10-422-90 equivalent to STO 79814898 115-2014	Seamless reducers	38–325	3–11
OST 34-10-423-90 equivalent to STO 79814898 116-2014	Turned reducers	18–57	2–3
OST 34-10-424-90 equivalent to STO 79814898 117-2014	Welded sheet reducers	377 x 273–1,200 x 1,000	6–12
OST 34-42-664-84 STO 95 118-2013 STO SRO-P 60542948 00014-2013	Turned reducers	14–32	2
OST 34-42-665-84 STO 95 119-2013 STO SRO-P 60542948 00015-2013	Welded sheet reducers	273–1,620	8–14
OST 34 10.700-97 STO SRO-P 60542948 00028-2013	st20 reducers	32–377	2.5–12
OST 24.125.08-89	Turned reducers for nuclear plant pipelines	10–57	2–3.5
OST 24.125.09-89	Die-stamped reducers for nuclear plant pipelines	57–273	4–19
OST 24.125.37-89	Turned reducers for nuclear plant pipelines	16–38	2–4
OST 24.125.38-89	Reducers for nuclear plant pipelines	57–426	4–24

Bend type	Letter code	Nominal diameter DN, mm		Wall thickness, mm	
		Larger	Smaller	Larger diameter	Меньший диаметр
Die-stamped	PSh, PShK, PShE	40–500	25–400	2–28	1.6–26
Die-stamped and welded	PShS	500–1,400	400–1,200	12–60	12–60

Blanks

Standard	Intended use	Diameter, min/max, mm	Wall thickness, min/max, mm
OST 34-10-428-90 STO 95 110-2013	Raised face blank flanges	10–1,200	6–32
OST 34-42-666-84 STO 95 166-2013 STO SRO-P 60542948 00016-2013	Weld-on flat pipe blanks	57–1,020	3–10
OST 34-42-667-84 STO 95 133-2013 STO 95 134-2013	Ribbed weld-on flat pipe blanks	377–1,620	8–14

Nipples

Standard	Intended use	Diameter, min/max, mm
OST 34-10-439-90	Nipples	6–50
OST 34-10-509-90	Nipples	14–530
OST 34-42-670-84 STO 95 121-2013 STO SRO-P 60542948 00018-2013	Nipple branches	14–76
OST 34-42-671-84 STO 95 122-2013 STO SRO-P 60542948 00019-2013	Nipples	10–76
OST 24.125.11-89	Nipples in sizes DN < 50 mm for nuclear plant pipelines	14–38
OST 24.125.12-89	Nipples for nuclear plant pipelines	57–325
OST 24.125.41-89	Nipples in sizes DN < 50 mm for nuclear plant pipelines	16–38
OST 24.125.42-89	Nipples for nuclear plant pipelines	57–159
STO 79814898 122-2009	Nipples	10–57
STO 79814898 123-2009	Nipples for branches	14–108

Stoppers

Standard	Intended use	Diameter, min/ max, mm	Wall thickness, min/ max, mm
OST 24.125.21-89	Stoppers for nuclear plant pipelines	14–219	2–13
OST 24.125.53.89	Stoppers for nuclear plant pipelines	16–465	2–24

Bosses

Standard	Intended use	Diameter, min/ max, mm	Wall thickness, min/ max, mm
OST 24.125.22-89	Pup pieces for nuclear plant pipelines	35–56	1.5–2
OST 24.125.57-89	Pup pieces for nuclear plant pipelines	34–78	1.5–2

Plugs

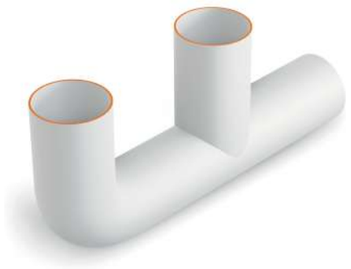
Standard	Intended use	Diameter, min/ max, mm	Wall thickness, min/ max, mm
OST 24.125.23-89	Plugs for nuclear plant pipelines	36–55	1.5–2

Pipes

Standard	Intended use	Diameter, min/ max, mm	Wall thickness, min/ max, mm
TC 95.349-2000	Longitudinal electric-welded pipes of steel grades 08Kh18N10T, 12Kh18N10T for nuclear and thermal power plants	377–1,620	6–14
TC 95.499-00	Longitudinal electric-welded pipes of steel grades 20 and 16GS for nuclear and thermal power plants	377–1,620	6–14

* All products manufactured by the company comply with ISO 9001-2015. The company is licensed to design equipment for nuclear power units and manufacture equipment for nuclear power plants.

PIPING SPOOLS



INTENDED USE:

Assembling pipeline assemblies in a factory environment to individual requirements

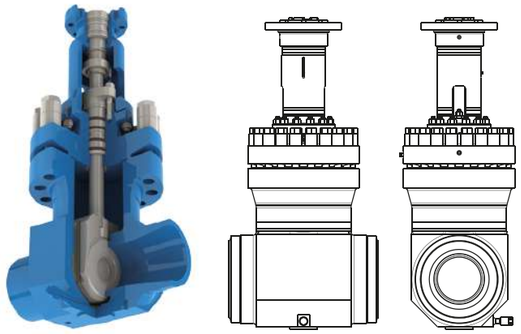
Standards

Standard	Intended use	Diameter, min/max, mm	Wall thickness, min/max, mm
OST 108.030.123-85*	Fittings and assembly units of austenitic steels for pipelines with medium pressures over 2.2 MPa (22 kgf per cm)	10–426*	2–60*
OST 108.030.124-85*	Fittings and assembly units of pearlite steels for pipelines with medium pressures over 2.2 MPa (22 kgf per cm)	10–530*	
STO 95-111*	Fittings and elements of nuclear plant pipelines of corrosion-resistant steels for pressures of up to 2.2 MPa (22 kgf per cm2)	108–1,020*	
STO 95-112*	Fittings and elements of steam and hot water pipelines and nuclear power plant process piping made of pearlite steels for pressures of up to 2.2 MPa (22 kgf per cm2)	108–1,020*	

* Products can be manufactured in accordance with other standards or in line with individual customer requirements upon agreement.

ON-OFF VALVES

A 00
Wedge gate valves



KEY TECHNICAL PARAMETERS:

- Primary circuit heat transfer medium, vapor-gas mixture, acid, alkali, pulp, drains, salt concentrate, oil, and vapor
- Weld connection
- Maximum design temperature – up to +350 °C
- Maximum design pressure – up to 20.0 MPa
- Size class range, DN 50–800
- Material for body fittings:
  - Wrought carbon steel
  - Wrought austenitic steel
  - Wrought alloy steel

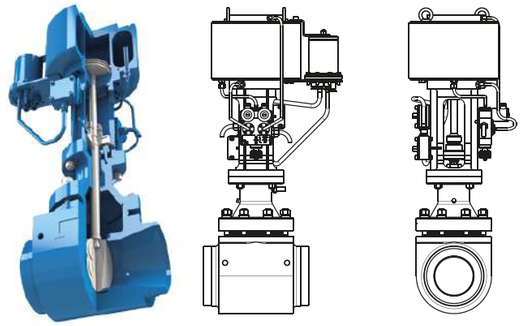
CONTROL:

- Manual control via a gear-operated handwheel
- Electric actuator
- Remote control

DESCRIPTION:

The gate valve has a wrought steel body, with a weld connection. Flanged connection with a spiral gasket between the cover and body.

A 01
Quick-operating pneumatic wedge gate valves



KEY TECHNICAL PARAMETERS:

- Process water, oil, steam, air, gas
- Weld connection
- Maximum design temperature – up to +250 °C
- Maximum design pressure – up to 2.5 MPa
- Size class range, DN 100–400
- Material for body fittings:
  - Wrought carbon steel
  - Wrought austenitic steel
- Opening/closing time ≤ 10 s
- Control air pressure – at least 4.5 MPa

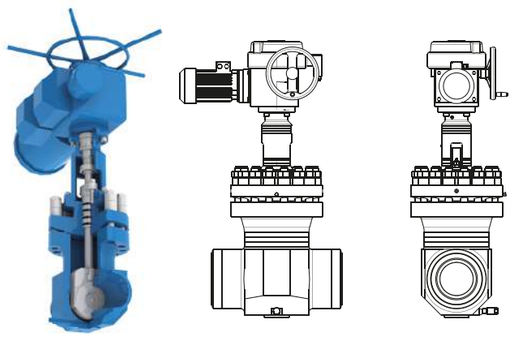
CONTROL:

- Pneumatic actuator

DESCRIPTION:

The gate valve has a wrought steel body, with a weld connection. Flanged connection between the cover and body with an additional internal nib sealing.

A 01
Quick-operating gate valves with an electric actuator



KEY TECHNICAL PARAMETERS:

- Process water, oil, steam, air, gas
- Weld connection
- Maximum design temperature – up to +250 °C
- Maximum design pressure – up to 2.5 MPa
- Size class range, DN 100–400
- Material for body fittings:
  – Wrought carbon steel
  – Wrought austenitic steel
- Opening/closing time ≤ 10 s
- Control air pressure – at least 4.5 MPa

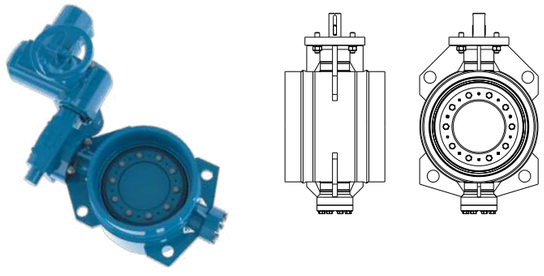
CONTROL:

- Pneumatic actuator

DESCRIPTION:

The gate valve has a wrought steel body, with a weld connection. Wrought steel cover, with the flanged connection between the cover and body featuring a special seal.

L32
On-off swing valves



KEY TECHNICAL PARAMETERS:

- Process water, condensate, inert gases, air, seawater
- Connection method
- – Weld connection
  – Wafer connection
- Maximum design temperature – up to +200 °C
- Maximum design pressure – up to 2.5 MPa
- Size class range, DN 150–1200
- Material for body fittings:
  – Wrought carbon steel
  – Wrought austenitic steel
  – Wrought SAF 2507 (for seawater)
- Seal – NRB (HNRB) radiation-proof rubber, spiral graphite

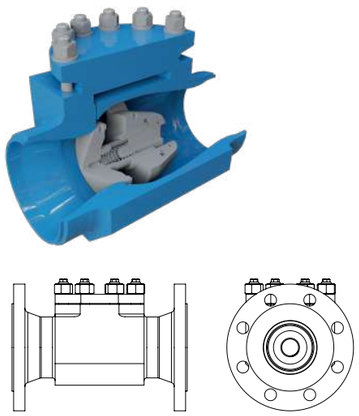
CONTROL:

- Manual control via a gear-operated handwheel
- Electric actuator (gear)

DESCRIPTION:

The valves operate as on-off valves to fully open or close the flow channel under full pressure differential and are not designed to control the medium flow. Earthquake resistance as per NP-031-01 – I.

A14
Axisymmetric check valves



KEY TECHNICAL PARAMETERS:

- Vapor-gas mixture, process water, deactivation solutions, drains, nitrogen, feedwater, primary circuit heat transfer medium, boron concentrate (up to 40 g/kg), oil
- Weld connection
- Maximum design temperature – up to +350 °C
- Maximum design pressure – up to 20.0 MPa
- Size class range, DN 100–400
- Material for body fittings:
  – Wrought carbon steel
  – Wrought austenitic steel
- Control method – operating medium flow
- Seal – NRB (HNRB) radiation-proof rubber, spiral graphite

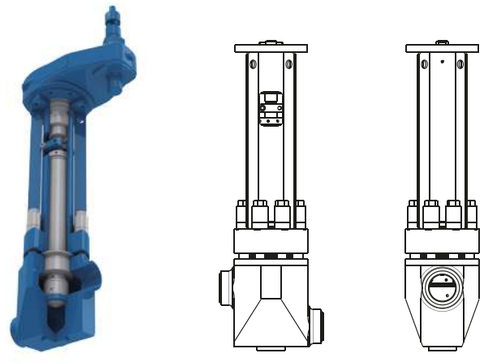
CONTROL:

- Operating medium flow

DESCRIPTION:

The valves are designed to automatically prevent medium backflow in nuclear plant pipeline and equipment process systems. Earthquake resistance category as per NP-031-01 – I, with the flanged connection between the cover and body featuring a special seal.

A 10, A 11
On-off, and on-off and control globe valves with bellows seal



KEY TECHNICAL PARAMETERS:

- Water, steam, air, gas, crude oil, non-aggressive media
- Weld connection
- For operating temperatures of up to +350 °C
- Operating pressure up to 20.0 MPa
- Size class range, DN 50–150
- Material: – Carbon steel
  – Austenitic steel

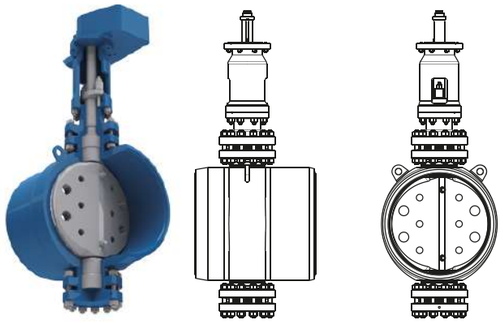
CONTROL:

- Manual control
- Electric actuator
- Remote control

DESCRIPTION:

The bellows globe valve has a wrought steel body, with a weld connection. Flanged connection with a metal-to-metal seal between the cover and body. The stem sealing to prevent leakage includes bellows reinforced with a gland seal.

A 49
Throttle control valve



KEY TECHNICAL PARAMETERS:

- Water, non-aggressive media
- Weld connection
- For operating temperatures of up to +300 °C
- Operating pressure up to 11.0 MPa
- Size class range, DN 800
- Material: – Carbon steel
  – Austenitic steel

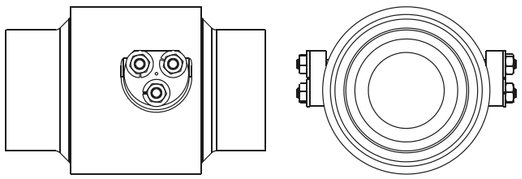
CONTROL:

- Electric actuator

DESCRIPTION:

The control valve has a wrought steel body, with its internal surfaces lined with austenitic steel. Weld connection to the pipeline. The valve disc has been designed specifically to control the flow.

A 41
Check valve with hydraulic shock protection



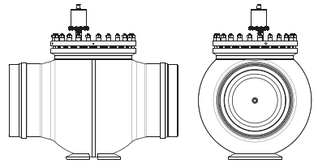
KEY TECHNICAL PARAMETERS:

- Water, steam, air, gas, crude oil, non-aggressive media
- Weld connection
- For operating temperatures of up to +350 °C
- Operating pressure up to 20.0 MPa
- Size class range, DN 50–800
- Material: – Carbon steel
  – Austenitic steel

DESCRIPTION:

The check valve has a wrought steel body, with a weld or counter flange connection to the pipeline. We also manufacture check valves from SAF 2507 special steel, which is highly resistant to aggressive operating media (such as seawater). The valve disc swings on two semi-axes, with their common axis displaced with regard to the body axis.

A 42
Check valve with a remote position indicator



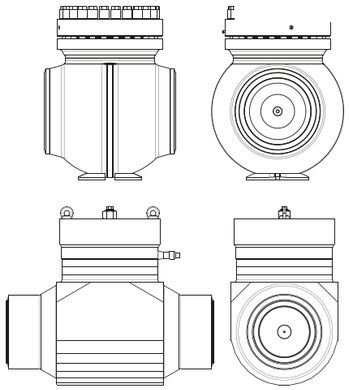
KEY TECHNICAL PARAMETERS:

- Water, steam, air, gas, crude oil, non-aggressive media
- Weld connection
- For operating temperatures of up to +350 °C
- Operating pressure up to 20.0 MPa
- Size class range, DN 100–600
- Material: – Carbon steel
  – Austenitic steel

DESCRIPTION:

The check valve has a wrought steel body, with a weld connection to the pipeline. The disc is mounted on an axis that is located above the flow axis. Flanged connection between the cover and body. For repair, the valve does not need to be removed from the pipeline. The disc position is indicated by a device mounted on the valve's cover, with the sensor controlled by the disc.

C 23, A 44
Check valves, pressure seal cover check valves



KEY TECHNICAL PARAMETERS:

- Water, steam, air, gas, crude oil, non-aggressive media
- Weld connection
- For operating temperatures of up to +350 °C
- Operating pressure up to 20.0 MPa
- Size class range, DN 50–600
- Material: – Carbon steel
  – Austenitic steel

CONTROL:

- Operating medium flow

DESCRIPTION:

The check valve has a wrought steel body, with a weld connection to the pipeline. The disc is mounted on an axis that is located above the flow axis. Flanged connection between the cover and body. For repair, the valve does not need to be removed from the pipeline.

KEY TECHNICAL PARAMETERS:

- Water, steam, air, gas, crude oil, non-aggressive media
- Weld connection
- For operating temperatures of up to +350 °C
- Operating pressure up to 20.0 MPa
- Size class range, DN 100–300
- Material: – Carbon steel
  – Austenitic steel

DESCRIPTION:

The check valve has a wrought steel body, with a weld connection to the pipeline. A self-sealing cover, with a seal from several graphite rings. For repair, the valve does not need to be removed from the pipeline.

PIPE HANGERS AND SUPPORTS

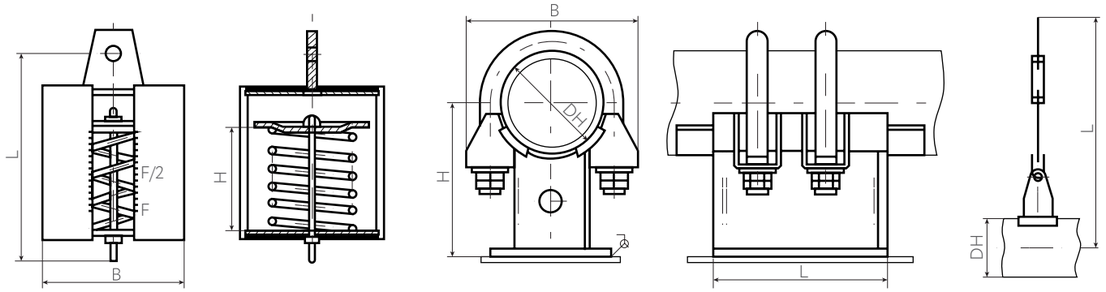
Pipe hangers and supports system are designed for laying pipelines, keeping pipelines in the designed position and distributing the pipeline's own weight. Pipe hangers and support are made with diameters of up to 1,620 mm.

Despite of pipe hangers and supports system, other products for connecting the pipeline with the foundation / bearing structure are offered - braces and brackets.

Carbon, chromium-molybdenum, silicon-manganese, and austenitic steels are used in the manufacturing of pipe hangers and supports system and the elements.

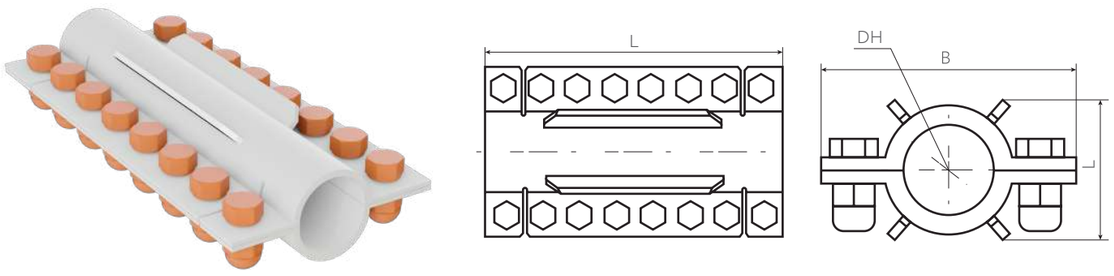
Pipe hangers and supports elements

TMK ETERNO's enterprises produce the wide range of elements products for pipe hangers and support systems such as supports, hangers, clamps, beams, springs, etc.



Pipe whip restraints

Designed to prevent pipeline ends from moving apart and their further whip-like motion in case of a full guillotine break of the pipeline.

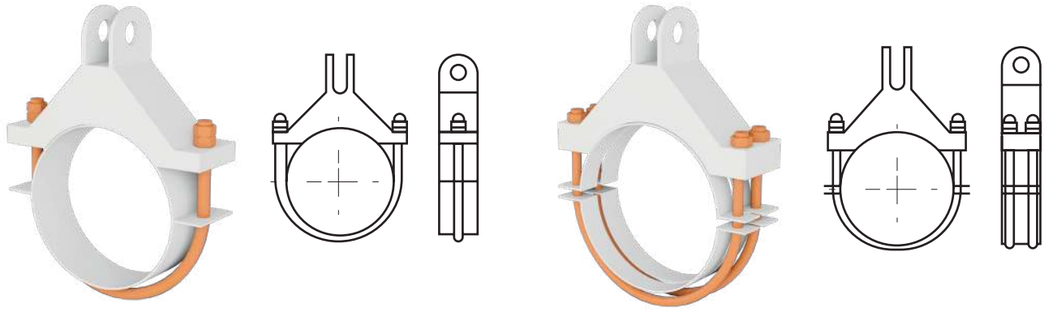


Sliding clamps

Designed for use together with other elements to enable pipeline movement along its axis while preventing lateral movement.

The clamps are manufactured in line with design documentation; the TMK ETERNO's enterprises can supply non-standard design.

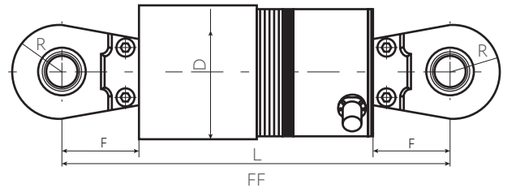
Non-standard design includes custom-designed based on standalone terms of reference, with mandatory specification of tolerances regarding maximum allowable loads, parameters, dimensions, and materials.



HYDRAULIC SHOCK ARRESTOR (ABSORBER)

Designed to restrict movement of nuclear plant primary and secondary circuit equipment under seismic and emergency dynamic loads.

They serve as a rigid support for equipment moved at a speed above its maximum allowable speed to prevent its destruction.



Product parameters

Nominal load, kN	Stroke, mm	R, mm	F, mm	D, mm	L, mm		Weight, kg
					Min	Max	
46.0	150	30	65	135	445	595	21.0
	300	30	65	135	595	895	29.0
100.0	150	45	100	170	535	685	377.0
	300	45	100	170	685	985	51.0
200.0	150	60	130	200	615	765	61.0
	300	60	130	200	7,665	1,065	78.0
250.0	150	75	165	270	730	880	122.0
	300	75	165	270	880	1,180	147.0
550.0	150	105	165	300	760	910	175.0
	300	105	165	300	910	1,210	207.0

The products are manufactured under a development program. By agreement with the manufacturer, we can produce hydraulic snubbers that are not specified in the table,

05.

Non-standard equipment and metal structures

The TMK ETERNO division is a leader in designing and manufacturing non-standard equipment and metal structures, including for the metallurgical, machine-building, and construction industries.

TMK ETERNO's own production facilities are fitted with advanced high-tech equipment.

By leveraging its smart and creative approach to engineering and design support of projects, TMK ETERNO can fulfil orders of any complexity in the shortest timeframe.

With its established and optimized engineering and production processes, the TMK ETERNO division can provide its customers with some of the best partnership terms in the industry.

METALLURGICAL EQUIPMENT

Basic oxygen furnaces and their fittings

160–320 tonnes

20–160 mm

7.6–10 m

8.6–12.2 m

A basic oxygen furnace is a pear-shaped vessel rotating on trunnions, lined on the inside and equipped with a taphole for discharging molten steel and an opening at the top to insert oxygen tuyeres into the converter, vent gases, pour in hot metal, feed scrap and flux materials, and discharge slag.

Steel ladles

up to 380 tonnes

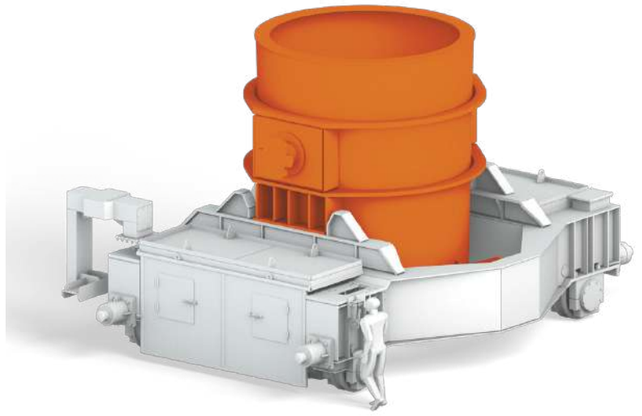
10–40 mm

1.0–5.5 m

1.0–5.6 m

Steel ladles are used to collect molten steel from the furnace, transport, and then cast it.

A steel ladle is an open-topped lined vessel that allows to keep metal liquid for a short time and cast it into molds.



Ladle cars for steel, hot metal, and slag

200–420 tonnes

Slag ladle cars are used to transport molten slag to slag dumps.

Hot-metal ladle cars are designed to move molten iron to BOF shops, where it is transformed into steel in steelmaking converters by blowing air or oxygen through it.

Steel ladle cars are designed to transport ladles with molten steel from the converter to the casting line; position the ladle under the converter when tapping steel; bring and remove the converter handling equipment; and clean the rail tracks and floor under the converter from metal and slag residues.

Scrap buckets

3–115 m^3

6–90 tonnes

The scrap bucket is designed to transport and load charge to an electric arc furnace. The bucket has a cylindrical body fit with fastenings for transportation (lifting beam) and a tilting device (a lifting beam with chains fastened to clamshell doors) on the outside.

Blast furnace shells

A blast furnace is a large, vertically arranged, shaft-type smelting metallurgical furnace. Pig iron is made in the blast furnace.

Blast furnaces are as high as a 42-meter 15-story building. Blast furnace runs 24/7 and is only stopped for overhaul of worn-out fittings every 10 to 20 years. The entire blast furnace is assembled in a steel shell (casing) with a wall thickness of at least 40 mm.

Hot metal mixer

The mobile automated special mixer is designed to receive hot metal from blast furnaces, transport it to the pouring area of the BOF shop, temporarily store hot metal in order to equalize its chemical composition and temperature, and discharge it into a hot metal ladle. The mixer is moved along rail tracks by a locomotive.

TANKS AND VESSELS

5–100 м³

EARTHQUAKE RESISTANCE:
up to 9 intensity degrees

Products can be coated and provided with additional structural elements such as ladders, partitions, oil retention baffles, or heat exchangers.

Vessels are used to drain residual dark and light petroleum products, crude oil, oils, condensate (including in mixture with water), washing liquid (detergent solutions) from process networks (pipelines) and equipment at enterprises of the oil refining, petrochemical, oil, and gas industries.Tanks are used for aboveground and underground storage of crude oil, dark and light petroleum products, as well as for discharging oil and petroleum products from pressure wave smoothing systems.

TMK ETERNO manufactures the following types of tanks and vessels under TU 3615-008-32551486-2016:

- EP – underground drain vessel
- EPP – underground drain vessel with a heater
- RGS – aboveground tank
- RGSP – underground tank for installation in an excavated pit
- RGSP – underground tank for installation in a concrete vault

Key parameters of EP and EPP vessels

Nominal capacity, m³	8	12.5	16	20	25	40	63	100
Inner shell diameter, mm	2,000			2,400			3,000	3,200
Operating pressure, MPa	0.07							
Operating temperature	from –15 °C to +80 °C							

Основные характеристики резервуаров РГС и РГСП

Nominal capacity, m³	4	5	8	10	20	25	50	60	75	100
Inner shell diameter, mm	1,370	1,900	1,585	2,220	2,475	2,760			3,240	
Operating pressure, MPa	0.07									
Operating temperature	from –15 °C to +80 °C									

METAL STRUCTURES

The enterprise of the TMK ETERNO division is one of the leading manufacturers of steel construction structures for industrial and civil purposes. The plant participated in the construction projects of the country's largest metallurgical plants, pipe and steel plants. In addition to the production of metal structures for industrial facilities, the plant has a large experience in the production of civil constructions, such as construction, shopping complexes, office buildings, bridge spans, etc.

The plant's contribution to the implementation of large projects for the construction of sports facilities deserves special mention. His custom-made structures were used in the construction of the roofs of the Luzhniki Bolshoi Stadium, the sports arena, the ice skating center in Krylatsk, the Ice Palace on Khodynskoye Pole, the all-season ski center in the Moscow region, the indoor ice skating center Uralskaya Molniya (Chelyabinsk) and many others others

Production of high-quality metal structures according to GOST 23118-2019.

CORE OPERATING SEGMENTS:

- Manufacturing of steel structures for construction and operation of industrial buildings and facilities
- Manufacturing of steel structures for civil construction
- Manufacturing of custom, unique, large-size structures that require high-precision manufacturing
- Manufacturing of metal structures for bridge spans and power lines
- Manufacturing of welded I-beams from flat-rolled sheets

METAL STRUCTURES

MANUFACTURING CAPABILITIES:

- Production floor space: over 100 thousand m^2
- A Quality Management System certified to ISO 9001:2015
- Unique equipment: automated production lines, gantries to weld T-joints and I-joints, gas and plasma cutting machines, etc.
- Lifting capacity of cranes: up to 60 tonnes
- All welders are certified, 80% are Level I specialists
- Quality control throughout the entire manufacturing process: an in-house laboratory for destructive and non-destructive testing
- Two wheel blasting machines to clean incoming rolled steel and seven shot blasting cabinets to clean structures to Sa 2.5+ standard (GOST 2789-73), latest painting equipment, 14 mobile drying cabinets, and equipment to round sharp edges of incoming rolled steel to prevent paint chipping
- In-house shop to apply fire protection coatings
- Delivery by road and rail, including large-size structures; own industrial spur track
- Located in the Urals, close to Russia’s major steelmakers, CSSP enjoys the lowest possible procurement logistics costs for rolled steel, the key feedstock for its steel structures

06.

The division’s integrated engineering solutions

The TMK ETERNO division delivers on projects of any complexity as requested by the customer under EP (Engineering and Procurement) contracts. Our company has all the necessary capabilities and resources to offer design, manufacture, and delivery of equipment for:

- oil and gas production and transportation
- metallurgy
- oil and gas refining and processing, and petrochemicals
- the nuclear industry
- other major industries (fertilizers, pulp and paper, agriculture, thermal power, etc.).

ENGINEERING CENTER’S EXPERTISE

Integrated engineering solutions for metallurgy

- Casting and steelmaking equipment
- Inspections of operating equipment and reverse engineering
- Basic and detailed engineering
- Design of transportation and process equipment of any complexity

Integrated engineering solutions for pipeline transportation of oil, gas, and petrochemicals

Turnkey supply of pipelines.

Bundled supplies of the full range of trunk pipeline equipment to transport oil, gas, and petroleum products:

- Pipe assemblies
- On-off and control valves
- Pipeline supports
- Connection elements

Integrated engineering solutions for oil and gas refining and processing, and petrochemicals

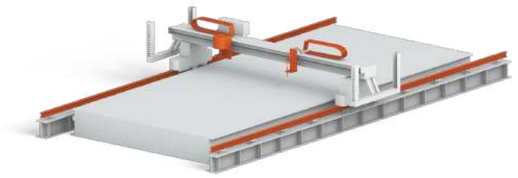
Turnkey supply of equipment for oil and gas refining and processing.

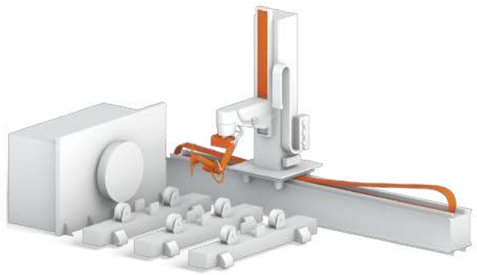
- Modular equipment
- Pipelines
- Metal structures
- On-off and control valves
- Equipment for tanks, vessels, and heat exchangers

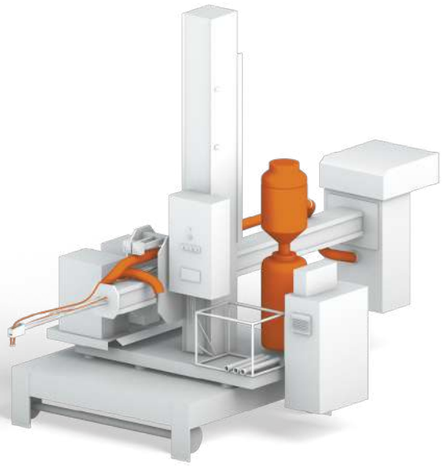
Engineering center’s expertise

- Basic and detailed engineering
- Reverse engineering
- All types of calculations
- Supervision of installation and commissioning of delivered equipment

PRODUCTION CAPACITIES







Billet machining equipment:

5,000 mm

30,000 mm

up to 200 mm (straight cut)

- Oxy-fuel cutting
- Plasma cutting
- Water jet cutting
- Bandsaw machines
- Automated plasma systems for cutting non-standard billet shapes

Welding equipment:

More than 250 pieces of equipment for manual arc, gas metal arc, and mechanized welding.

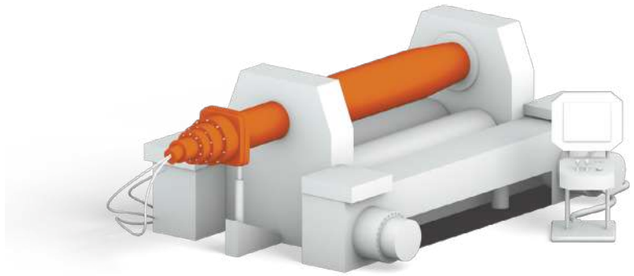
Equipment for automated welding:

1. Welding units CAB 300, 460C – 7 pieces
2. Voskhod orbital welding units – 8 pieces
3. AMI orbital TIG welding equipment – 1 piece
4. Gantries to weld metal structures – 2 pieces
5. Welding tractors and self-propelled machines for submerged-arc and shielding gas welding – 10 pieces
6. FANUC arc welding robots – 5 pieces
7. Stud welding equipment – 1 piece
8. Welding manipulators and roller supports – more than 30 sets

Our capabilities allow us to weld longitudinal and round welded joints with diameters of up to 4,000 mm and thickness of up to 150 mm, as well as large-size metal structures of various configurations and weld studs.

The division enterprises have mastered welding of carbon (up to K65, X70+X100), austenitic, heat resistant, creep resistant and duplex steel grades.

Special welding wires and fluxes are used in production, which allows us to weld seams with a special structure and required mechanical properties and performance.



Bending and rolling equipment:

Shells	min 450 mm max not limited
Walls	min 8 mm max 110 mm

Pressing equipment:

Presses with capacities of up to 7,000 tonnes allow us to produce fittings of various configurations by hot and cold stamping.

Work surface: 2,600 x 3,000 mm.

Horizontal broaching machines support the manufacture of sharply curved bends with diameters from 45 mm to 820 mm.

Pipe bending equipment

Pipe bending machines use induction heating to produce bends with diameters from 57 mm to 1,420 mm.

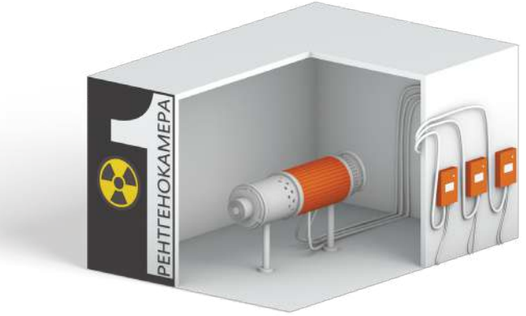
Heat treatment capabilities:

Furnace heat treatment

PRODUCT SIZE LIMITS FOR WATER QUENCHING:

- 4,100 mm
- up to 3,000 mm
- up to 7,500 mm
- up to 2,400 mm

The available equipment and technologies allow us to perform secondary refining of metal products of any size.



Non-destructive testing capabilities:

The TMK ETERNO division enterprises have all the necessary equipment and certified staff to conduct the main types of non-destructive testing used in machine building:

- Visual
- Liquid penetrant (including magnetic particle testing)
- Ultrasonic
- Radiographic

PRODUCTION CAPACITIES

Machining capabilities:

The division enterprises have a vast array of equipment for machining products, including both universal and machines: horizontal machining centers, turn-mill centers and high-speed five-axis gantry machining center.

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

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