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Severstal

The Energy of achievement

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About the Company

Severstal at a glance

Severstal is one of the world's most efficient metals and mining companies, working with customers and partners to create new products and integrated solutions from steel.

The main production site of the company Cherepovets Steel Mill was opened in 1955 in the city of Cherepovets, Russia.

Our strategy is to maximize shareholder value by building a healthy and high-quality business that generates higher than market average earnings throughout the economic cycle.

Severstal is one of the leading suppliers to oil and gas companies with experience in Russia and worldwide.

Moreover, Severstal provides customers with a wide range of products, including rolled steel products for oil and gas pipes and products for LNG.

At present, our company focuses on providing customized services and packaged solutions to customers.

Severstal in Numbers

11.6
million tonnes of steel

70
assets

53.8
thousand employees

600
Thousand tonnes of pipes (annual capacity)

Advantages of Cooperation

Cost Efficiency

Severstal is the most cost-efficient Russian steel supplier for international companies. We attribute our cost-efficiency to these factors:

- Vertical integration of the company.

This means we have control over our whole production chain, from raw materials to finished pipe products. Severstal products comply with ISO 9001 and ISO 14001 international standards.

- Strategic location near the port.

Our main large diameter Longitudinal Submerged Arc-Welding Pipe (LSAW) production facility is strategically located next to the port facilities in St Petersburg, Russia. The location of Severstal's asset allows to optimize delivering products by sea to our customers.

Product Packages

Severstal is able to offer not only large diameter pipes (LSAW), but also such steel products as fittings, ball-valves, and other flat and long steel products that might be required for the project. For instance, for the construction of liquefied natural gas storage and transportation facilities we can supply cryogenic steel, cryogenic rebar, and heat exchangers thanks to co-production with Linde and other solutions.

Customized Solutions

Severstal can modify its product specifications to fit our customers' needs, and we can do this from the very beginning of the manufacturing process. This allows us to provide our customers with best-fit solutions for their projects. Severstal has its own R&D department that is able to develop unique, tailored products and value-added engineering solutions based on specific client requirements. In 2019-2020, the company has sold approximately 150 thousand tonnes of highly innovative products to customers in the energy industry.

Sustainable Development

and Corporate Social Responsibility

Severstal's long-term priorities are the consideration of social, economic, and environmental aspects and focus on safety and corporate governance. We aspire to maintain the highest possible production standards, from occupational safety to protecting our environment.

TOP 10%

In 2019, Severstal entered the Sustainalytics ESG rating's top 10% of steel companies globally

RATING B

In 2020, MSCI upgraded Severstal's ESG rating to B

Industry Recognition

Severstal joined the UN Global Compact in 2018, it supports Sustainable Development Goals and contributes actively to achieve them. Moreover, Severstal was one of the first companies to join Worldsteel's 'Step Up' programme, which aims to reduce GHG emissions by the global steel industry through the introduction of new methodology.

In 2021, Severstal was recognized by Worldsteel as a Steel Sustainability Champion, being one of the companies to have demonstrated most clearly their commitment to sustainable development.

Decarbonization

In 2020, Severstal announced a 3-year emissions reduction target covering our Scope 1, 2, and 3 emissions at its main asset – the Cherepovets Steel Mill. In July 2021, the Company set additional medium-term goals to reduce the carbon intensity of its CO_2 emissions calculated according to Worldsteel's methodology, by 10% by 31 December 2030.

In 2021, Severstal made another step toward reducing its carbon footprint by signing MoUs on decarbonization efforts with Russian energy producers Gazpromneft and Novatek, involving joint carbon capture and storage projects.

Focus on Safety

Improving the level of occupational safety is one of Severstal's KPIs. In 2018, the Company announced public safety goals, which envisage a 50% reduction in LTIFR by 2025 from 2017 levels, as well as the elimination of fatal injuries. By the end of 2020, 64% of this target had already been achieved.

Objectives by 2025

50%

Reduction of LTIFR by compared with 2017

12%

Reduction of the weight of discharged wastewater pollutants

13%

Reduction of total atmospheric emissions of pollutants

Large Diameter LSAW Pipes

Large Diameter LSAW Pipes

for Onshore and Offshore Pipelines

Large diameter pipes are used for construction of oil and gas pipelines. Severstal has more than 15-year experience of producing large diameter pipes for key projects in Russia and worldwide.

Severstal's large diameter pipes producer Izhora Pipe Mill is ready to provide you high-quality pipes compliance with API 5L, ISO 3183, CSA Z245.1, DNV-OS-F101, EN 10219-1, EN 10217-1, EN 10217-3, EN 10217-5 standards. Moreover, Severstal has the ability to develop new products or technologies for every particular client's project.

Production facility of LDP, Izhora Pipe Mill, is located near St. Petersburg.

Testing equipment of Izhora Pipe Mill: NDT of plates and welded seams, X-ray, MPI, automated geometry control, hydrotest. Excellent laboratory provides various testing options, including CTOD and DWTT.

Technical specification

Outer diameter	508 – 1422 / 20 – 56 mm/in
Wall thickness	8 – 40 mm
Pipe length	9.5 - 18.3* m
Steel grade	Gr B - X100

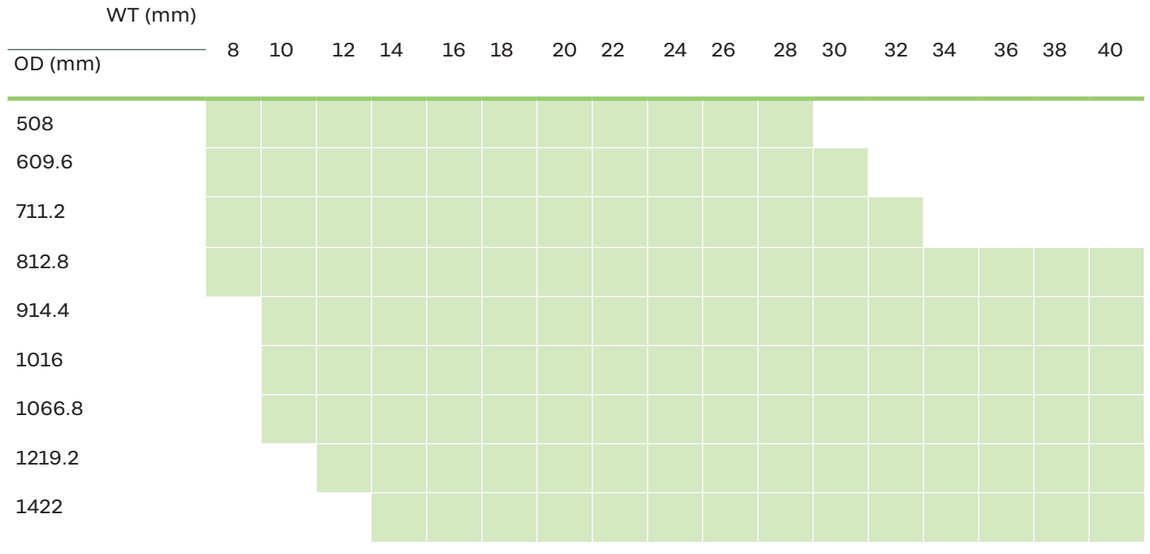
External Coatings

- External 3LPE & 3LPP coating
- Concrete weight coating (CWC)*
- FBE, DFBE coating
- Epoxy glass coating*
- Protection Varnish and epoxy coating

*coatings which may be applied with the involvement of third-party organizationsc

Internal Flow Coatings

- Internal epoxy coating



Large Diameter Pipes

with improved cold resistance

Severstal’s large diameter pipes producer Izhora Pipe Mill is ready to provide you pipes with improved cold resistance for usage in extreme cold outside conditions.

Technical Data

Steel grade	Wall thickness, mm	Outer diameter, mm/in	Length, m	Standards	External Coatings
Up to X70	8 – 40	508 – 1422 / 20 – 56	10.5 – 18.3	API 5L, ISO 3183	External 3LPE & 3LPP coating as well as internal epoxy coating

Unique characteristics

Cold resistance (KV -52°C)	DWTT (-52°C)	CTOD (-52°C)	Operation feasibility
At least 200 J	At least 90 %	At least 0.25	Used down to – 58°C

Pipes
for sour service

The pipes designed for the transportation of hydrogen sulfide-containing substances, as well as for the construction of pipelines requiring a high level of responsibility, transporting CO_2 - containing substances. Available in various strength grades: X52 - X70.

Pipes must withstand high mechanical loads during installation and have resistance to operational corrosion.

Offered of products

- L245MS or BMS
- L290MS or X42MS
- L320MS or X46MS
- L360MS or X52MS
- L390MS or X56MS
- L415MS or X60MS
- L450MS or X65MS
- L485MS or X70MS
- normalized products
- up to L360NS or X52NS

Corrosion resistance testing

- Hydrogen cracking test according to NACE TM 0284
- Sulfide stress corrosion cracking according to NACE TM 0177

Compliance with

- ANSI/NACE MR0175/ISO 15156-2
- API Spec 5L / ISO 3183 Annex H

Pipes with high deformation capacity

Pipes with high deformation capacity for sections of gas transportation pipelines used in seismically unstable areas. These pipes are made of special low-alloy steel.

These large diameter pipes are in demand for the construction of gas pipelines in regions with permafrost soils, laying in areas with a weak soil carrying capacity, areas of high seismic activity, and crossing of tectonically active faults.

The high deformation capacity and cold resistance ensure the reliability and durability of pipelines, as well as the safety of transportation of gas.

Power of Siberia Project

Izhora Pipe Mill has shipped 1420 mm diameter pipes with wall thickness – 25.8/32 mm, made of X70 steel and protected with external coatings and internal epoxy coatings, for the Power of Siberia gas pipeline section located in the regions of high seismic activity.

Technical Data

Steel grade	X70-X80
Pipeline Operating Pressure	11. 8 MPa
Minimal air temperature	- 40°C
Minimum Uniform Elongation	8%
Maximum Yield To Tensile Ratio	0.86
CVN	40°C min 250 J
DWTT	20°C min 85%
CTOD	20°C min 0.40

Coatings for pipes

External Coatings

- 2-ayer polyethylene (2LPE) coating as per DIN 30670 and 3-layer polyethylene (3LPE) coating according to DIN 30670, ISO 21809-1 for onshore and offshore oil & gas pipelines with operating temperature from -60°C up to +80°C.
- 3-layer polypropylene (3LPP) coating according to DIN 30678, ISO 21809-1 for onshore and offshore oil & gas pipelines with operating temperature from -20°C up to +110°C.

Internal Flow Coatings

- Flow coating based on 2K epoxy painting with high dried residue content for dry sweet gas transport.
- Corrosion resistant coating based on 2K solvent free epoxy coating for transport of oil, oil products, drinking water, etc.

Both coatings comply with AWWA C210, ISO 12944, API RP 5L2 or similar standards.

03

Hot rolled flat products

Hot rolled

flat products for oil & gas line pipes

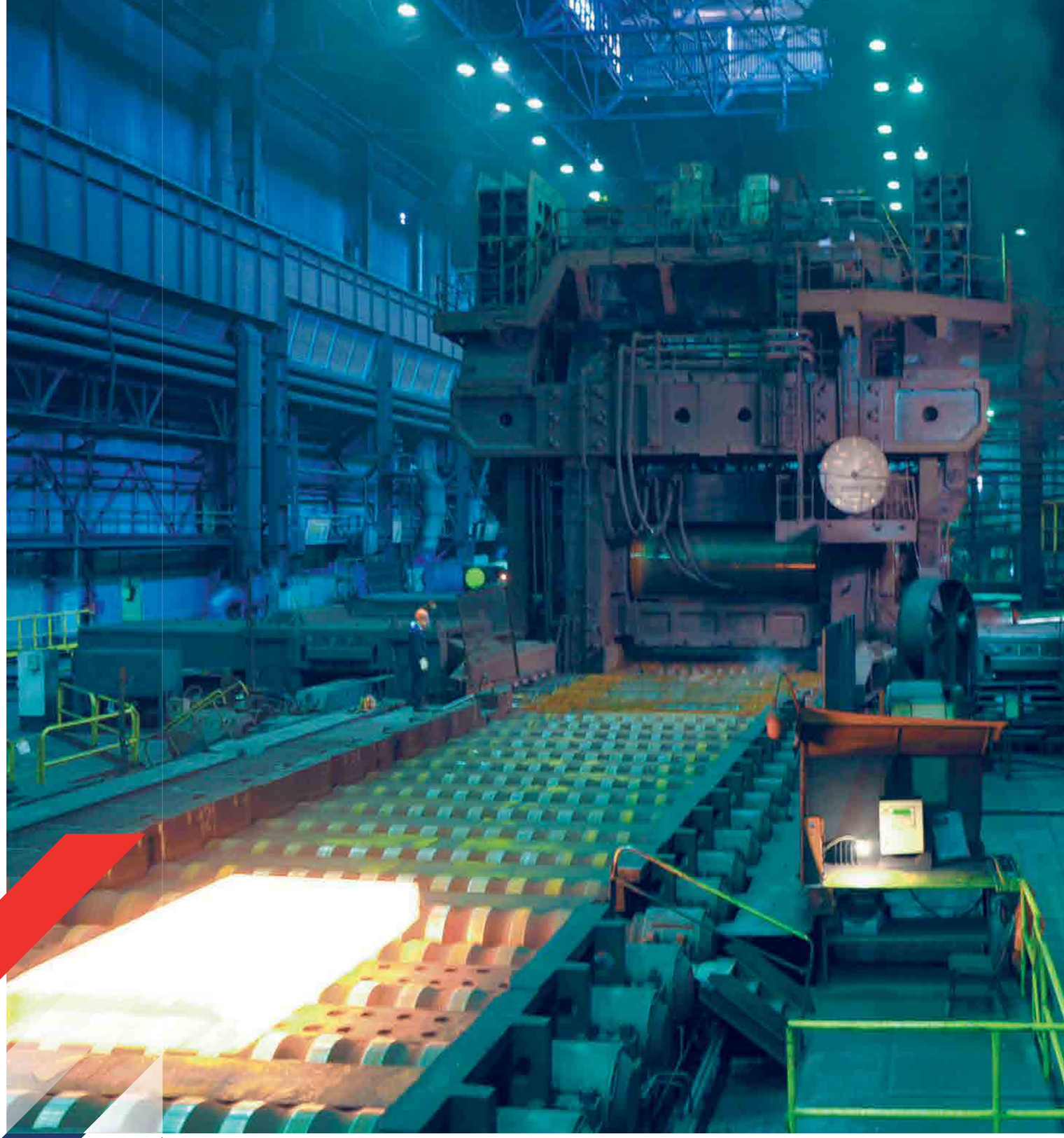
Severstal produces hot rolled coils and plates for large diameter pipes production.

Hot-rolled plates

Steel grade	Thickness, mm	Width, mm	Length, mm	Standards
B – X100	10 – 45	1500 – 4600	2000 – 18300	API 5L, DNV, ISO 3183

Hot rolled coils

Steel grade	Thickness, mm	Width, mm	Standards
B – X70	5 – 15	950 – 1700	API 5L, DNV, ISO 3183



Hot rolled

flat products for OCTG pipes

Being an essential part of field infrastructure, OCTG and line pipes must be made from steel products of high and stable quality.

Severstal has a huge experience in producing flat products for OCTG and line pipes in accordance with API 5L and API 5CT standards.

Severstal is able to produce almost the whole range of API steel grades in hot-rolled coils.

Technical Data

Steel grade	Width, mm	Thickness, mm
J55 and J55 upgradable, X52-X70	950 – 1700	4 – 15

Cold resistant flat products

Cold resistant flat products and pipes are used for development of oil and gas infrastructure in extreme cold weather conditions.

Severstal (Mill 5000) produces hot rolled plates with high quality for extremely cold conditions.

Technical Data

Steel grade	Standard	Thickness, mm	Length, mm	Width, mm
Up to X70	API 2H, ISO 3183, DNV	10 – 45	Up to 18000	1200 – 4400

Unique characteristics

Cold resistance (KV-52°C)	at least 200 J
DWTT (-52°C)	at least 90%
CTOD (-52°C)	at least 0.25

Hot rolled plates

for offshore construction

Severstal produces hot rolled plates for stationary marine installations.

Technical Data

Steel grade	Wall thickness, mm	Width, mm	Length, mm
S355G10+N	8 – 100	2000 – 18300	1500 – 4600

Cryonix X7Ni9

Cryogenic flat products

Cold resistant low-carbon steel X7Ni9 with 9% nickel according to EN 10028-4.

It has high cold resistance at low temperatures (down to minus 196 °C) and is designed for inner shell casing of LNG storage tanks.

Additional operations

Rolled products are additionally processed using high-tech equipment:

- shot blasting
- rolling
- forming
- edge processing for further welding
- primer application

Customer receives a ready-for-installation article

Advantages

High strength combined with ductility

These properties are achieved thanks to a perfectly balanced composition of chemical elements and a lower content of harmful impurities and gases.

Improved impact strength (lower temperature of ductile-brittle transition)

At least 100 J KV in longitudinal direction

Certification in accordance with European quality standards and regulations

Product certification for compliance with European Directive 2014/68/EU at TÜV Rheinland Industrie Service GmbH

Technical Data

Thickness, mm	Width, mm	Length, mm	Yield strength, 0.2%, MPa	Tensile strength, MPa	Elongation, %	KV at -196°C, J	Delivery condition
8 - 50	up to 2.500	up to 12.100	≥ 585 (t ≤ 30) ≥ 575 (30 < t ≤ 50) t – thickness, mm	690 - 820	≥ 18	(⊥) ≥ 80, (∥) ≥ 100	+QT*

* Delivery conditions + N + NT are also possible for nominal thickness <15 mm

Flat steel

for construction

Severstal has been manufacturing and supplying products for construction industry since 1960.

Our key priority is the comprehensive approach: from the design stage to construction, Severstal is ready to support its clients by providing technical consulting and developing new products for the customers' needs.

Technical Data

Steel grade	Standard	Thickness, mm	Length, mm	Width, mm
S235 to S690	EN 10025, EN 10225+CE+PED	12 – 150	2000 – 18000	1200 – 4600

Unique characteristics

Cold resistance (KV-52°C) at least 56 J.

Flat products

for shipbuilding

Technical Data

Steel grade	Thickness, mm	Width, mm	Length, mm	Standard
Hot rolled steel for shipbuilding	10 – 70	1200 – 4600	2000 – 18000	GOST R 52927 (PMPC)

Unique characteristics

Stratified explosion resistance (-40°C) Z, W, Arc (for the thickness of up to 70 mm).

Bimetallic flat products

Flat bimetallic steel

As a possible cost-effective solution for improving steel properties, Severstal is ready to provide bimetallic flat products made by cladding of stainless steel with low-carbon steel.

Technical Data

Basic layer	Cladding layer	Thickness, mm	Width, mm	Length, mm
SA516 Gr415-Gr70, SA-387M Gr11-Gr22 Cl2, SA542M GrD Cl4a	304(L), 321, 316(L), 316Ti, 410(S)- SA240	20 – 100	1500 – 4000	2000 – 10 000

Unique characteristics

- A combination of low-carbon and stainless steel layer
- High uniformity of cladding layer

04

Cold rolled flat products

Cold rolled flat products

Technical Data

Sheets, mm (AxBxC)	Coil, mm (AxB)	Standard
0.40 – 2.80 x 900 – 1600 x 1000 – 4000	0.40 – 3.20 x 500 – 1600	GOST, STP, STO, EN, JIS, ASTM

High strength package strap with up to 960 MPa yield strength and 4–8% elongation.

Hot dip galvanized flat products

Technical Data

Thickness, mm	Width, mm	Standard
0.30 – 2.00	900 – 1500	GOST, STP, STO, EN, JIS, ASTM

Color coated rolled products

Technical Data

Thickness, mm	Width, mm	Standard
0.35 – 1.5	900 – 1500	GOST, STP, STO, EN, JIS, ASTM

Key advantages

- High quality and surface cleanliness
- Improved strength properties combined with good ductility
- Guaranteed flatness (+/-5 mm/m tolerance)
- Normalized strength properties
- High ductility to ensure good formability
- Improved geometry
- Possibility to apply various coatings
- Rolled products are certified to standards of global leading producers
- Steel Service Center in Europe and Russia to provide additional services, e.g., cut-to-length, cut-to-sheet, just-in-time deliveries

Rolled products are delivered in coils.
It is possible to deliver them as slit strip
from 100 to 750 mm wide.

05

Long products

Long and shaped rolled products

Technical Data

Products	Standards	Dimensions, mm
Rounds in coils, rounds in bars, surface-conditioned rounds	GOST, ASTM, EN + CE, JIS	5 – 100
Rebar	GOST, ASTM, EN + CE, JIS	6 – 40
Angles	GOST, EN	20x20x3 – 100x100x9
U-channels	GOST, EN	5 – 10
Box channels	GOST, EN	50x160x4 – 100x250x8

Key advantages

- Comprehensive approach: customer support starting from the design stage to construction.
- New product development and turn-key engineering solutions.
- State-of-the-art and unique production facilities: Severgal, Severstal TPZ-Sheksna, color coated lines.
- Certification for compliance with the Russian and international standards.
- Customer technical support (technical expert advice, customer site visits).

Cryonix Ak500 and Armanorma A600C

steel rebars

Special cold-resistant type of reinforcing bars are used for reinforcement in concrete structures to be operated at low and extremely low temperatures in accordance with EN 14620.

- Armanorma A600C – use at temperatures down to –100 °C
- Cryonix Ak500 – use at temperatures down to –165 °C

Benefits

Ensure a reliable and less expensive structure

Strength properties of Armanorma are higher in comparison with steel rebars of class A400 and A500C, allowing to reduce metal consumption by 15-20%.

Higher strength with higher ductility

Yield strength from 650 N/mm^2, tensile strength from 740 N/mm^2.

Ensure additional fire resistance of a building

Softening point is +700 °C.

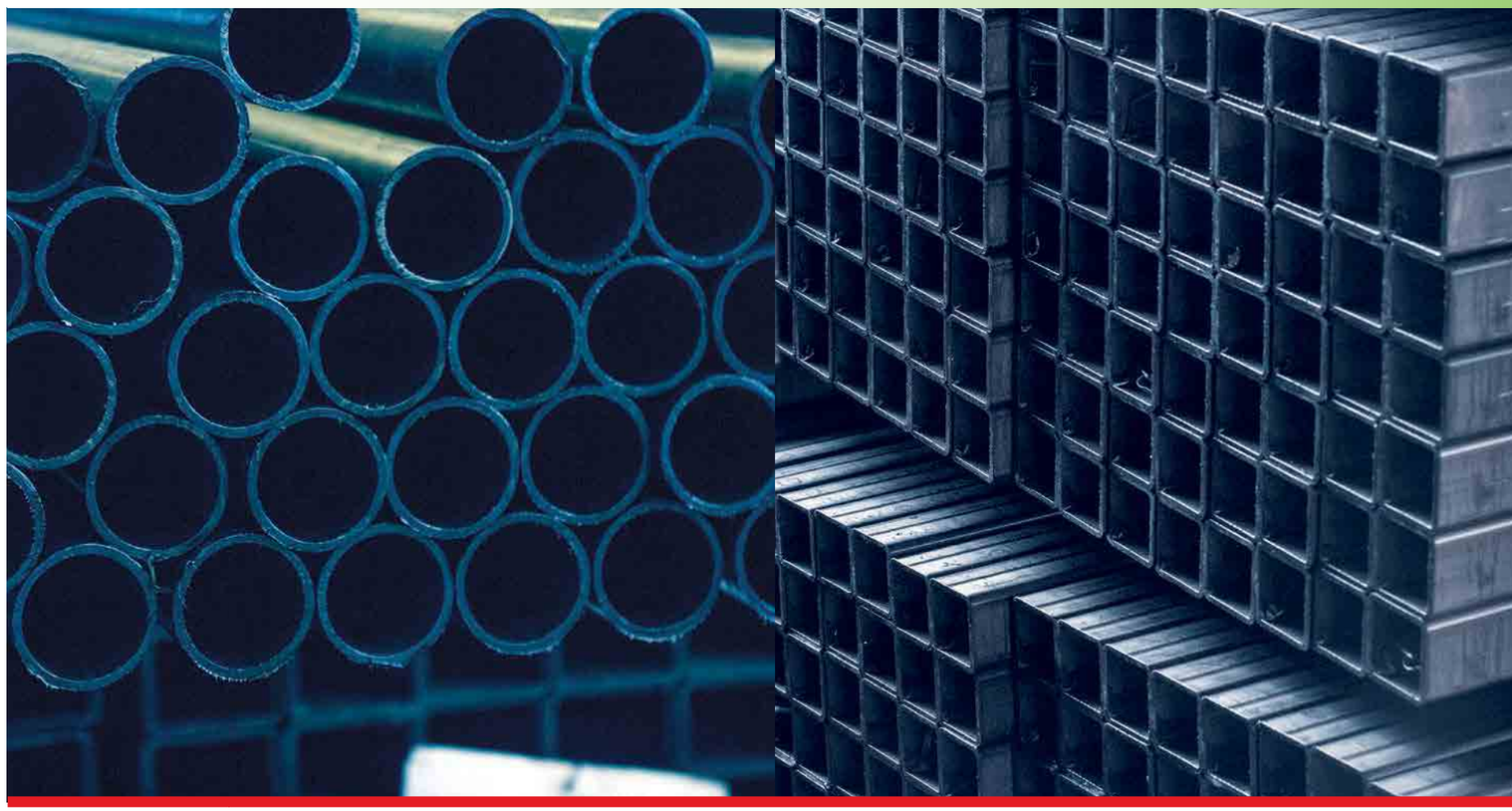
Seismic resistance

Maintaining strength in earthquakes of medium and high magnitude.

Technical Data

Rebars	Armanorma Class A600C	Cryonix Class Ак500
Standard	EN 14620, GOST R 58032-2017	
Length, m	6 - 12	
Diameter, mm	10, 12, 14, 16, 18, 20, 22, 25, 28, 32, 36, 40	
Notch sensitiveness coefficient, NSR	≥ 1at temperature downto –100 °C	≥ 1at temperature down to -165 °C

Cold formed welded structural sections



Circular sections

Technical Data

Steel grade	Standard	Wall thickness, mm	Outer dimensions, mm
S235 – S700	EN 10219+CE, EN 10220	3 – 16	159 – 426

Rectangular sections

Technical Data

Steel grade	Standard	Wall thickness, mm	Outer dimensions, mm
S235 – S700	EN 10219+CE, EN 10220	3 – 16	120 x 80 – 350 x 250

06

Metalware

The world’s first strand

for heavy lifting produced by Severstal-metiz

Strand jacking is an installation method used in heavy industry. The load is secured by rigging equipment, which is connected to a set of steel cables ("strands").

The strand jack pulls the strands and lifts the load. If numerous strand jacks are assembled together, they can lift thousands of tonnes of load.

There are three pillars of strand jacking:

- Quality of strand jacks and their components
- Qualification and expertise of the company perfoming the work
- Quality of strands

Severstal-metiz met the world’s leading heavy lifting companies and collected the specific parameters of strands most commonly used for heavy lifting process. We found out that most of the strands that are currently produced are designed for post-tension, whereas heavy lifting companies need a different product. So we created it. And we are happy to present an optimized strand:

Severstal-metiz special heavy lifting strands are 18 and 18.2 mm compacted strands with the 1860 MPa Nominal Tensile Strength. The characteristics of this strand exceed those provided by BS and EN standards. It features:

- Enhanced safety
- Higher resistance to surface damage
- Better performance for the reuse of strands

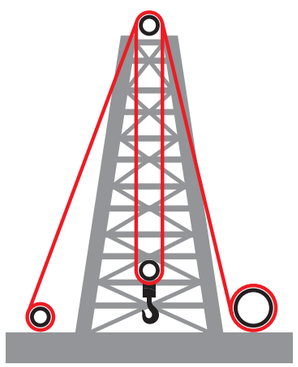
Special wire ropes
for oil & gas industry

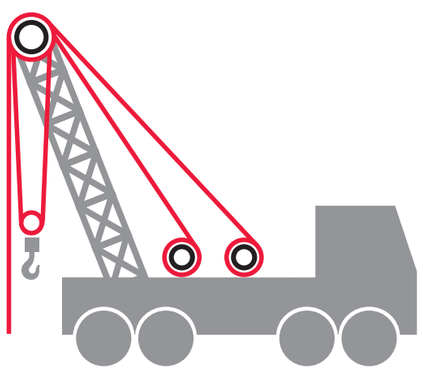
We developed a product line of special wire ropes called Octopus® with unique characteristics and extended life.

Advantages of Octopus® Wire Ropes

- high flexibility combined with wear resistance
- low-temperature operation
- exact diameter match
- lower impact of dynamic loads on the rope

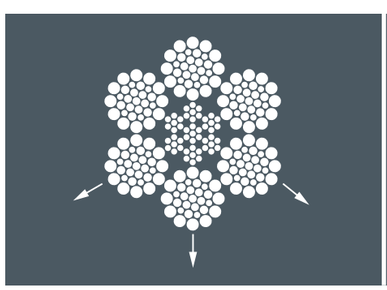
Drilling rigs and mobile drilling rigs. Drilling line

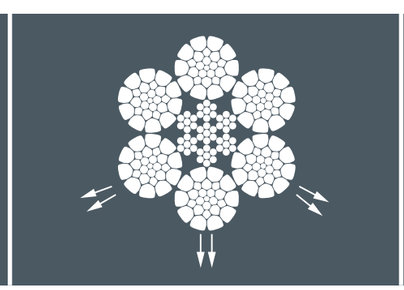


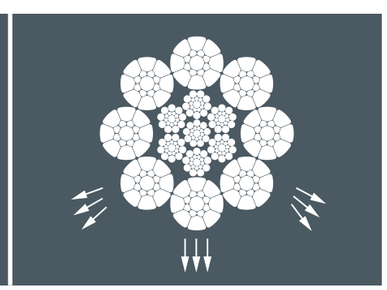


Performance comparison

GOST 16853-88 (6x31WS-IWRC)	Octopus 6K (6xK26WS-IWRC)	Octopus 817K (8xK17S-IWRC)
01 Diameter: 25.0 mm	01 Diameter: 25.0 mm	01 Diameter: 25.0 mm
02 Weight: 2.66 kg/m	02 Weight: 2.72 kg/m	02 Weight: 2.78 kg/m
03 Grade: 1770 N/mm²	03 Grade: 1770 N/mm²	03 Grade: 1770 N/mm²
04 Total breaking load: 531 kN	04 Total breaking load: 542 kN	04 Total breaking load: 548 kN







Octopus 6

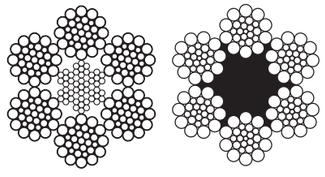
6-Strand Drill Line

STO 71915393-TU 068-2008

Construction
- 6x26 (1+5+5/5+10) + 1 fiber core
- 6x26 (1+5+5/5+10) + 7x7 (1+6)

Diameter: 25 – 38 mm

Advantages in comparison with standard solutions
- increased abrasion resistance
- high flexibility
- lower impact of dynamic loads on the rope



Octopus 6K

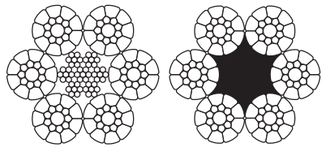
6-Strand Drill Line with Compacted Outer Strands

STO 71915393-TU 068-2008

Construction
- 6x26 (1+5+5/5+10) + 1 fiber core
- 6x26 (1+5+5/5+10) + 7x7 (1+6)

Diameter: 25 – 38 mm

Advantages in comparison with standard solutions
- increased abrasion resistance
- high flexibility
- lower impact of dynamic loads on the rope



Octopus 626

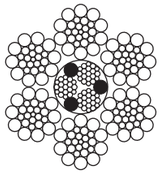
6-Strand Drill Line with Mixed Core

STO 71915393-TU 049-2007

Construction
- 6x26 (1+5+5/5+10)+3x19(1+6+6/6)+3 fiber fillers

Diameter: 25 – 38 mm

Advantages in comparison with standard solutions
- increased abrasion resistance
- high flexibility
- lower impact of dynamic loads on the rope



Octopus 626K

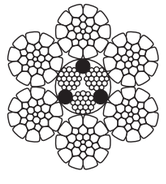
6-Strand Drill Line with Compacted Outer Strands & Mixed Core

STO 71915393-TU 049-2007

Construction
- 6x26 (1+5+5/5+10)+3x19(1+6+6/6)+3 fiber fillers

Diameter: 25 – 38 mm

Advantages in comparison with standard solutions
- increased abrasion resistance
- high flexibility
- lower impact of dynamic loads on the rope

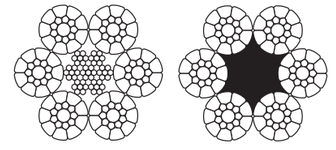


Octopus 619K

6-Strand Drill Line with Compacted Outer Strands

Construction
- 6x19 (1+9+9) + 1 fiber core
- 6x19 (1+9+9) + 7x7 (1+6)

Diameter: 25.4 – 38.1 mm
- Wire ropes are manufactured in accordance with the requirements of American Petroleum Institute API 9A;
- Stricter diameter tolerances.

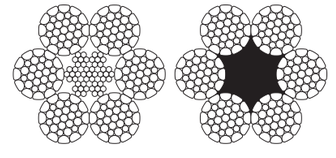


Octopus 631K

6-Strand Drill Line with Compacted Outer Strands

Construction
- 6x31 (1+6+6/6+12) + 1 fiber core
- 6x31 (1+6+6/6+12) + 7x7 (1+6)

Diameter: 25.4 – 38.1 mm
- Wire ropes are manufactured in accordance with the requirements of American Petroleum Institute API 9A;
- Stricter diameter tolerances.



Octopus 817 and 817K

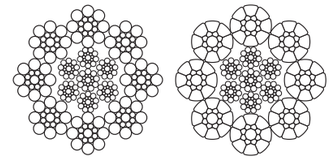
8-Strand Drill Line

STO 71915393-TU 072-2009

Construction
- 8x17(1+8+8)+6x19(1+9+9)+1x19(1+9+9)

Diameter: 25 – 38 mm

Advantages in comparison with standard solutions
- higher flexibility in comparison with 6-strand wire ropes
- high strength
- reduced friction between outer wires of strands and pulley groove surface



Octopus 826K

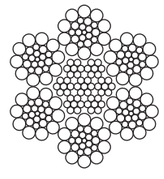
8-Strand Drill Line with Compacted Outer Strands

STO 71915393-TU 051-2007

Construction
- 8x26(1+5+5/5+10) + 6x17(1+8+8) + 1x17(1+8+8)

Diameter: 25 – 38 mm

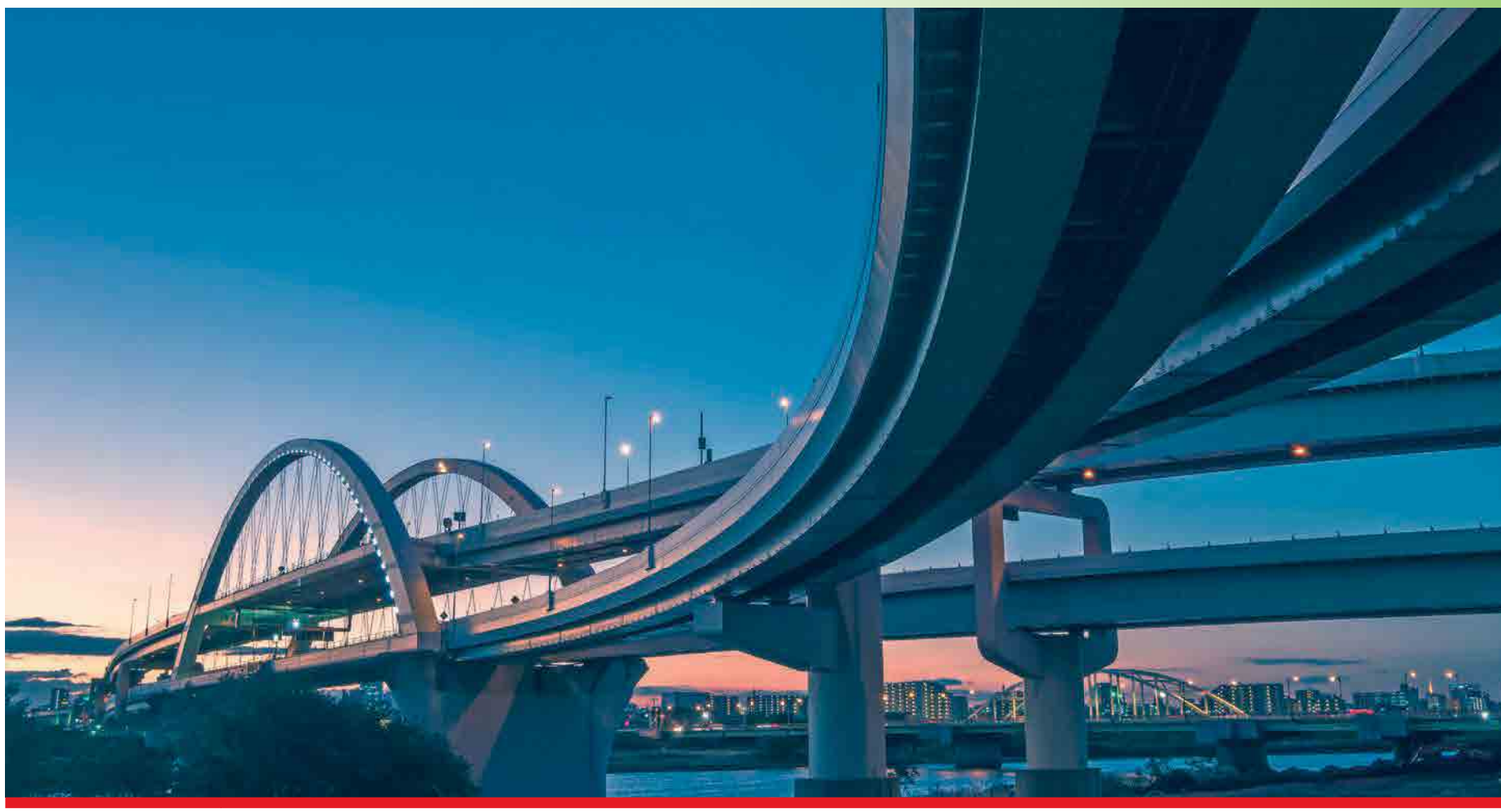
Advantages in comparison with standard solutions
- increased wire abrasion resistance;
- less pulley groove wear;
- improved strength characteristics;
- increased resistance against transverse crushing.



PC STRAND

Applied as a steel reinforcement of prestressed concrete constructions.

PC strands possess a number of advantages over those manufactured using tempering technology: 10 – 15% increase of yield strength and breaking strength; 25 – 30% increase of elongation limit; 5 – 8% decrease of relaxation strain losses; increase of construction reliability and durability. It is possible to manufacture PC strand from round wires as well as from profiled wires.



Technical characteristics

Diameter, mm	Tensile strength, N/mm²	Nominal cross-sectional area, mm²	Weight 1 m, kg	Minimum breaking load, kN
6.85	2060	28.2	0.220	58.1
6.9	1860	29	0.227	53.9
9.0	1860	50	0.391	93.0
9.3	1770	52	0.406	92.0
	1860			96.7
9.6	1860	55	0.430	102.0
11.0	1860	71.8	0.661	133.0
12.5	1770	93	0.726	165.0
	1860			173.0
(12.7)	1860	112	0.875	208.0
12.9	1860	100	0.781	186.0
15.2	1670	139	1.086	232.0
	1770			246.0
	1860			259.0
(15.2)	1860	165	1.289	307.0
15.7	1770	150	1.172	266.0
	1860			279.0
18	1170	200	1.562	354.0
(18)	1700	223	1.742	379.0

(12.7) – this dimension type of the strand is performed with compaction.
Compacted strands have high constructional density and a high breaking force.

Coil overall dimensions

Diameter, mm	Strand length in a coil, m maximum	Inner diameter of a coil, mm	Outer diameter of a coil, mm	Coil width, mm	Weight, kg
6.85	9050	700-850	Up to 1400	520-800	1400-2000
6.9	8800				
9.3	9850				
9.6	9300				
12.5	5500				
(12.7)	4570	800		760	
12.9	5120	900	Up to 1600	710	2000-4000
15.2	3680				
(15.2)	3100	956		500	
15.7	3400				
18	2560				
(18)	2300				

Uncoiling is performed from the inside. Layer-by-layer winding prevents strands from tangling and crossing, and measured coiling prevents any wastes when processing, thus reducing operational costs.

Steel shaped profiles

for sheet piling interlock

Our company has developed and patented a special system of profiles to make a sheet piling interlock.

Such profiles' system can be applied as an interlock in welded, pipe, and other sheet piling panels in the process of construction of hydraulic engineering, transport, and civil industry projects.

TU 14-1-3602-2009

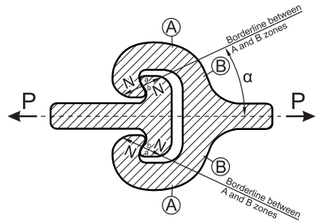
The interlock has passed the tests in Research and Development Center "Bridges" (Moscow) and in the certified testing center of JSC Severstal-metiz.

Test results of profiles, steel grade 09Г2С with chemical composition according to GOST 19281-89 (minimum tensile grade 325), have been carried out in the certified laboratory of Severstal-metiz and show that:

- Actual breaking force of an interlock on running centimeter basis is: $P1_{\text{specific breaking force}}$ from 38.5 kN/running centimeter up to 46.0 kN/running centimeter.
- Actual maximum normal stresses in flat parts of profiles in case of interlock break are: $\sigma1_{\text{max flat part}}$ from 326 N/mm² (MPa) up to 389 N/mm² (MPa).

Application of this interlock in sheet piling constructions is recommended by the following technological normative documents:

- GOST R 536-29-2009 Sheet piles of steel cold-formed sections
- TU 5264-001-07851735-2009 Welded sheet piling profiles
- TU 5264-015-01393674-2012 Welded sheet piles of half-round section
- TU 5264-016-01393674-2012 Welded pipe sheet piles



07

Products of Severgroup

Coil-wound heat exchangers

Coil-wound heat exchanger is the core process equipment of natural gas liquefaction and processing units.

They are used at petrochemical production facilities, in cryogenic gas separation units, air separation units, and gas liquefaction units.

Each coil-wound heat exchanger is customized and designed specifically according to technological requirements of the customer.

Severstal

- Technology for the production of coil-wound heat exchanger tailored to current customer needs based on optimal design and manufacturing solutions
- Application of international experience for production, quality, and supply chain management, industrial safety
- Guarantee of on-time delivery and quality of coil-heat exchangers thanks to extensive production network
- Ensuring comprehensive supplies of steel products for both the liquefaction unit and the LNG plant as a whole
- Definition of the optimal location for the production site and ensuring efficient logistics.

Serial modular buildings

We offer professional customized solutions to a wide range of industries.

Our team has technical expertise, industry knowledge, years of experience, and innovative thinking to provide first-class quality solutions. We work in close cooperation with our customers and partners, hence, we are able to handle the entire process – from design to manufacture and installation.

The production facilities allow to:

- manufacture large-sized structures, giving due consideration to the quality of complex joint assemblies;
- offer customers an integrated solution and customize the production process for each project;
- perform quality control and guarantee compliance of the manufactured products with the standard requirements.

Severstal's Quality Policy

Severstal adheres to a strict quality policy, which is the basis for all our operations. Severstal makes sure that the quality management system satisfies the leading international standards such as:

- GOST R ISO 9001 (ISO 9001);
- ISO/TS 16949;
- ISO/TS 29001 (API Spec.Q1).

Severstal aims to

- Make products that fully satisfy our customers' requirements.
- Continually improve its quality management system.
- Identify and plan ahead to satisfy our customers future business needs.
- Keep and expand our product markets.
- Continually improve efficiency.
- Continually work to improve product quality.

Our principles

- Customer focus.
- Leadership and responsibility.
- Company-wide shared vision and goals.
- Training and development of our employees.
- Continuous improvement.
- Detailed analysis to inform our decisions.
- Strong relationships with partners, customers, and suppliers.

Reference list for hot-rolled coils

Name and Owner of Project	Country	Grade	Product	Size, mm	Tonnage, mt	Date of delivery
Cameg Algeria, sweet gas	Turkey	X70M	coils	9.5 x 1500	19 628	2009
GK-4Algeria, sweet gas	Algeria	X70M	coils	12.7 x 1670 14.3 x 1670	4 417	2009
BTS-2 Russia, Transneft, oil pipeline	Russia	K52 (X60M)	sheets	11 x 1651 x 11800	1 934	2009
GK-4 Algeria, sweet gas	Algeria	X70M	coils	12.7 x 1670	9 870	2010
GK-5 Sonatrach-Alfapipe Algeria, sweet gas	Algeria	X70M	coils	13.15 x 1670	38 575	2012 - 2013
GK-5 Sonatrach-Borusan Algeria, sweet gas	Turkey	X70M	coils	14.3 x 1500	13 637	2012 - 2013
GK-5 Sonatrach-Umran Algeria, sweet gas	Turkey	X70M	coils	14.3 x 1400	12 600	2012 - 2013
GK-7 Sonatrach-Alfapipe lgeria, sweet gas	Algeria	X70M	coils	12.95-14.3 x 1700	36 000	2015
ROB1/STCLR1/DLP1 Sonatrach-Altumet Algeria, sweet gas	Algeria	X60M	coils	8.74-12.74 x 1080-1180	26 500	2015 - 2016
Transneft, maintenance program Russia	Russia	K56 (X65M)	sheets	12 x 1570 x 11800	5 050	2016
Transneft, maintenance program Russia	Russia	K56 (X65M)	plates	9-12 x 2210-2528 x 11600-12100	2 500	2016
Azertechnoline, Azerbaijan	Azerbaijan	13G1S-U (X60)	coils	15 x 1400	2 480	2018

Reference list for hot-rolled plates

Name and Owner of Project	Country	Grade	Pro-duct	Size, mm	Tonnage, mt	Date of delivery
Central Asia - China oil on-shore	Russia	K52 (X60M)/ K60 (X70M)	plates	11 x 3269 x 11800 13 x 3280 x 11800	73 266	2012 - 2013
Bovanenkovo to Ukhta Gas Pipeline Gazprom Natural gas, onshore	Russia	K60 (X70M), K65 (X80M), X80 (L555MC)	plates	17.5-33.4 x 3742-4353 x 11800	268 161	2012 - 2015
Power of Siberia Natural gas, onshore Russia Gazprom	Russia	K60 (X70M)	plates	21.70-32.00 x 4320-4361 x 11600-12800	348 608	2012 - 2018
South Stream-South Corridor Natural gas, onshore Russia Gazprom	Russia	K60 (X70M)	plates	21.60 x 4358 x 11800 21.60 x 4370 x 18200 25.80 x 4345 x 11800	427 907	2012 - 2017
South Stream - Anapa to Burgas Natural gas, offshore Gazprom	Russia	DNV 450 SPDV (X65M)	plates	33.40-39.00 x 2300-2405 x 11000-12150	364 000	2014 - 2017
Ukhta to Torzhok Pipeline Natural gas, offshore Gazprom	Russia	K60 (X70M)	plates	21.6 x 4358 x 11800	37 123	2015
Beltransgaz, maintenance program Russia	Russia	K55 (X65M)	plates	11-16 x 3748-3764 x 11600	23 357	2016
Nord Stream - 2 Natural gas, offshore Gazprom	Russia	DNV 485 FD (X70M)	plates	34.60 x 3693 x 11600	2 595	2016
Harampur oil field, Oil, onshore Russia Rosneft	Russia	K60 (X70M)	plates	13-24 x 3190-3829 x 11000-12150	104 000	2017-2018
Amur Gas Processing Plant, Natural Gas, onshore Gazprom	Russia	K60 (X70M)	plates	18-32 x 3829-4500 x 11000-12150	18 000	2018
Interconnector Poland-Slovakia, Natural Gas, onshore, Eustream	Slovakia	L485ME (X70M)	plates	13-18.6 x 3190 x 10500-18100	11 500	2018

Reference list for large diameter pipes (LSAW)

Customer	Location	Size (ODxWT), mm	Standard and Grade	Year
CAN Distribution Network	Canada	711.2 - 1066.8x9.53 - 19.05	API 5L/CSA; Gr B - X70M	2021
Southern Peru Copper	Peru	762x9.5	API 5L; X52	2020
GAZ-SYSTEM	Poland	1016x14.2; 22.2	EN ISO 3183; L485ME	2020-2021
USA Distribution Network	USA	800x19.05	ASTM A252; Gr 3	2020
Bulgartransgaz EAD	Bulgaria	1219x19.05	EN ISO 3183; L450ME	2019
Eustream A.S.	Slovakia	1016x13-18.6	EN ISO 3183; L485ME	2019
Petrojet	Egypt	914.4x12.7	API 5L; Gr B	2019
TurkStream	Russia-Turkey	812.8x39	DNV-OS-F101; 450 S FDU	2014-2018
Carbon Geocom LLC	Kazakhstan- China	1219x20.6	API 5L; X80M	2013
New Fortress Energy	Brazil	508x12.7	API 5L;X65M	2021

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