



TRUBOSTAL

«TRUBOSTAL»

RESEARCH & PRODUCTION ASSOCIATION

COMPANY PRESENTATION

Dear Sirs!

R&PA «TRUBOSTAL» has been successfully working in the metallurgical market of Ukraine and beyond for a quarter of a century.

Highly-skilled professionals of the enterprise are extensively improving the technology of production and mastering new equipment, using international experience of creating of high technology products.

Production is made to more than 100 different standards of Quality Management System ISO 9001:2008.

Currently the Research and Production Association is the largest manufacturer of centrifugally-cast tubes and products made of it as well as fittings, including products for thermal and nuclear power.

Our enterprise produces centrifugally-cast and cold-formed tubes of carbon, constructional, high alloy, stainless, heat-resistant and temperature-resistant steel and alloys, cast-iron with diameter 100... 1625mm, as well as bimetallic tubes. More than 200 grades of steel and cast-iron, more than 35 bimetallic combinations were acquired.

Fittings are made with a wide range of size, seamless and welded. We also produce cold-formed tubes according to domestic standards.



Enterprise and quality management system allows to work out any off-standard tasks rapidly and effectively. A client always can get complete and competent information from company's highly-skilled professionals. Constant client base extension is one of prime objectives of our enterprise.

R&PA «TRUBOSTAL» is looking to cooperate with all concerned in our products. Quality, reliability and high standards are our major priorities.

**Respectfully yours,
Alexander FELDMAN,
General Director of R&PA «TRUBOSTAL»,
Candidate of Science,
Honored Worker of Industry of Ukraine.**





COMPANY PRESENTATION

R&PA «Trubostal» consists of Production and Research Center «Trubostal», Trading House «Trubostal» and a number of other enterprises.

Research and Production Center «Trubostal» is a multi-industry research and production amalgamation, incorporated in 1989, is one of the leaders of pipe and tube production of Ukraine.

Production facilities of Research and Production Center «Trubostal» are situated within the town of Nikopol (Dnepropetrovsk region) and occupies an area of more than 20 hectares.

The amalgamation has a production plant of centrifugally-cast tubes and hollow ingots, fitting production plant, tube rolling section, machine-assembly department and a number of auxiliary production facilities.

There are more than 1000 people of personnel and 120 engineers among of them.

The company puts into practice an active innovation policy by using the experience of latest world development.





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HISTORY OF THE ENTERPRISE

1989 – research and production association «Trubostal» is established

1990 – cold-formed tubes production site is put into operation

1993 – fitting production plant is put into operation

2000 – experimental section of centrifugal casting is modified into the plant of centrifugally-cast tubes

2002 – tubing complex which provides machining for centrifugally-cast tubes is put into operation

2003 – high-temperature section for heat treatment of centrifugally-cast, cold-formed tubes and fittings is established

2004 – section for production of cold-formed tubes is put into operation

2006 – polymeric materials production site is put into operation

2008 – production of welded fittings including fittings for oil and gas industry is acquired

2009 – large-volume production of heat-resistant furnace and conveyor rolls is acquired

2010 – production of shaped parts by static casting method is acquired

2011 – production of centrifugally-cast tubes for petrochemical industry is acquired

2011 – «Atomteplostal» a Russian-Ukrainian joint venture for production of thermal and nuclear power industries needs is acquired

2011 – «Trading House «Trubostal» is established



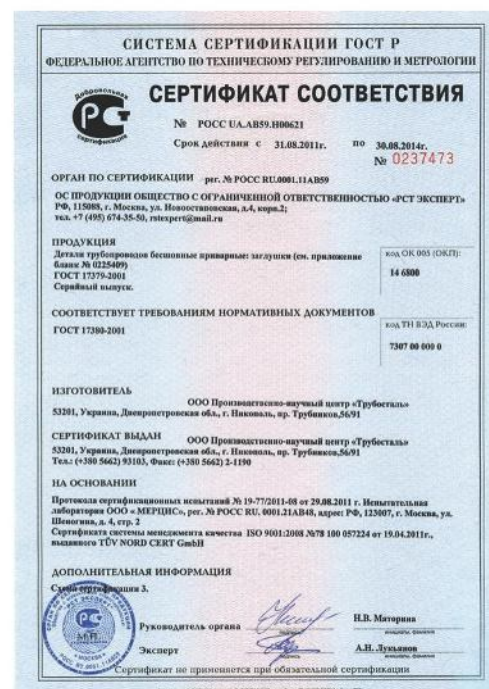
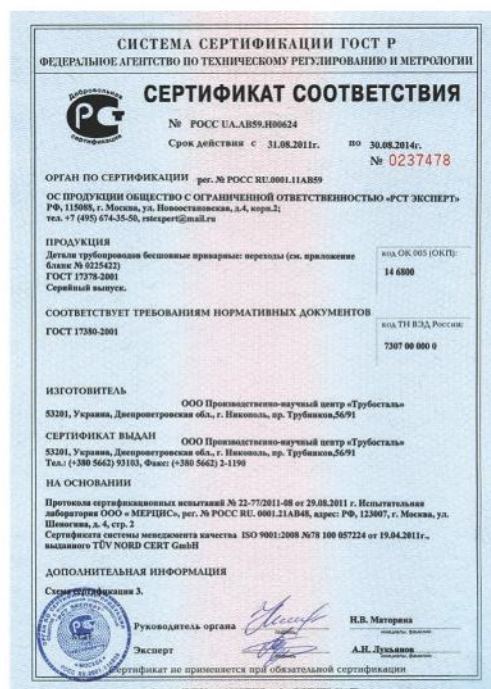
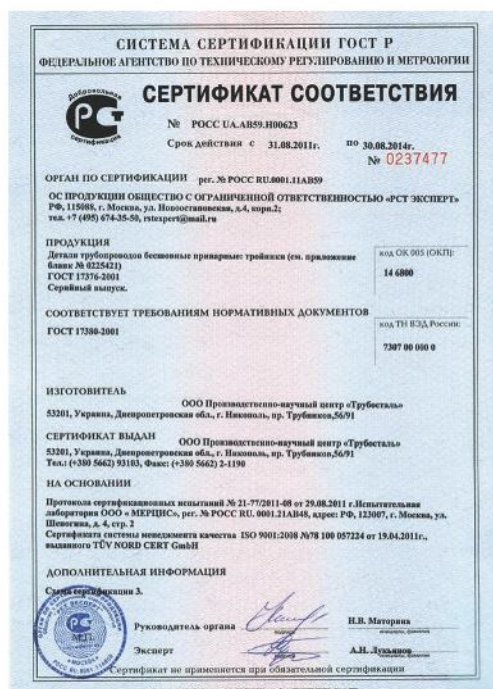


QUALITY SYSTEM

Quality management system of «Production and Research Association «Trubostal» meets the worlds requirements and certified according to ISO 9001-2008. Quality management systems are the systems of management for organization administration and directing.

Quality assurance makes decisive contribution to the customer's choice of products under intense competitive conditions. One of such assurances is certificate of conformity to ISO 9001.

In the first instance ISO 9001 certificate is the landmark of the enterprise which guarantees that all processes involving at the enterprise are controlled by factory management team.





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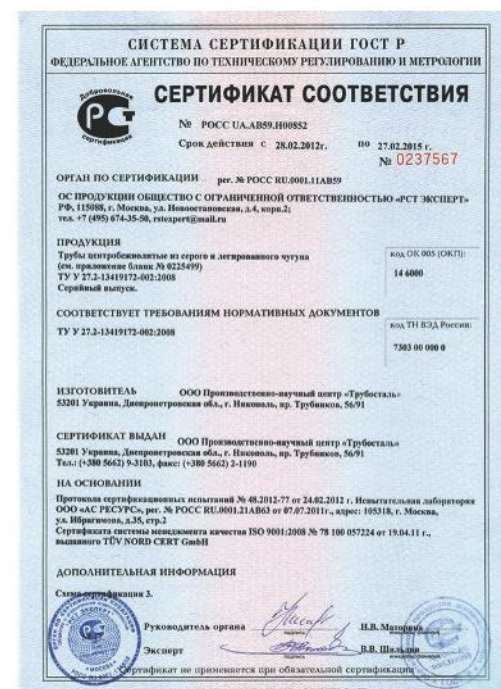
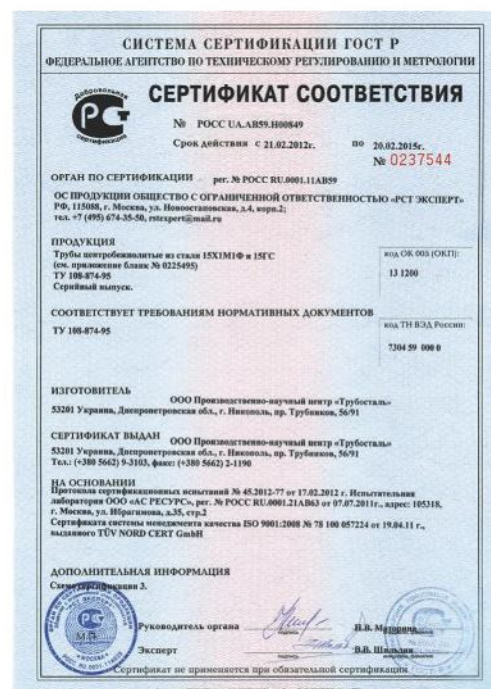
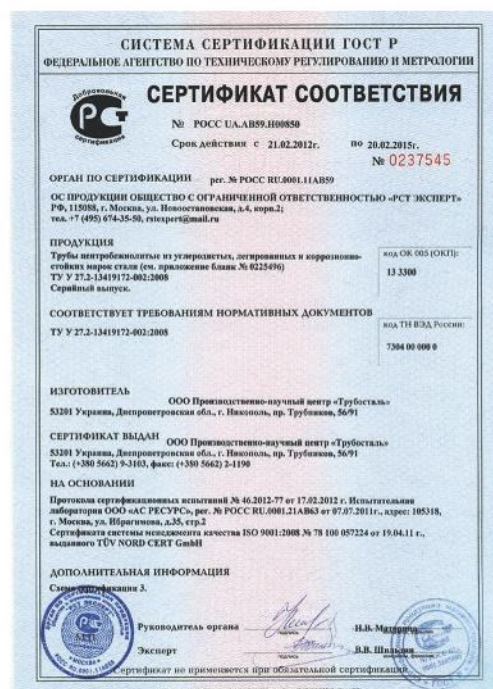
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ISO 9001 certification and adaptation allow the enterprise to maintain consistent quality of products as long as production process is controlled when such system operates.

The enterprise obtained more than a dozen of determinations and certifications of conformation for main types of products from such inspecting organizations as: TÜV NORD CERT (Germany), State

Standard of Russia, Promatomnadzor of Belorussia, Federal Agency license of environmental, technological and nuclear supervision of Russian Federation. Products of the plant made to standards: GOST 17375-2001; GOST 17376-2001; GOST 30753-2001; GOST 17378-2001; GOST 17379-2001; TU U 27.2-13419172-002:2008; TU 108-874-95, DIN, ANSI and other certified in certification system of State Standard of Russia.





PRODUCTION

PRODUCTION OF CENTRIFUGALLY-CAST TUBES AND SHAPED CASTINGS

For this production metal is produced in electric-arc and induction furnaces with the capacity from 160 to 5000kg. Annual output of molten metal is 20 kilo tons. There are centrifugally-cast tubes, hollow ingots, and cylindrical products with outer diameter 100-1625mm and wall thickness 7 to 25mm, length up to 6250mm of more than 200 steel grades, alloys, cast iron and bimetals made on 10 centrifugal machines of different constructs.

Tubes are supplied in cast condition, heat-treated, machined.

The injecting into a mould of cold hardening mixtures is made at the site of shaped castings (a-cet process).

We are able to produce castings from 9th category of precision with overall dimensions from 70 to 4000mm and roughing weight up to 5 ton, with wall-thickness up to 300mm of more than 130 steel grades and alloys, cast iron from GG10 to GGG60, alloyed cast-iron.





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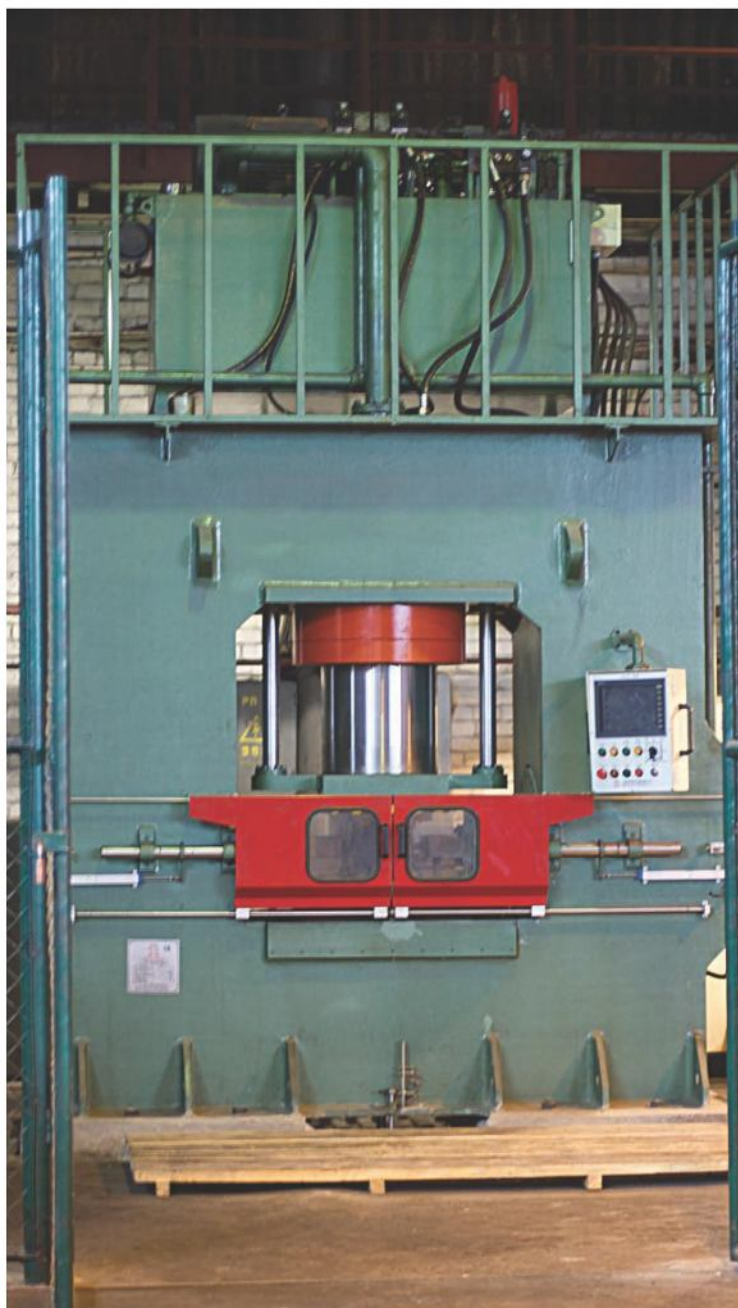
MECHANICAL ASSEMBLY PRODUCTION

Mechanical assembly production is equipped with bevy of screw-cutting (which includes center-to-center distance 5000 to 6000mm, weight of details up to 15 ton), vertical turning, boring-facing, milling, grinding, drilling (which includes deep hole drilling) mills, stands for welding of pipes into sections by automatic and semi-automatic welding, large part of equipment has numerical program control. There is a stand for building-up welding.

Roughing machining and finishing of tubes, rotary parts – furnace rolls, rolls for billet discharge conveyors, rolls for runout roller tables, cylinders of hot dip galvanizing lines, bands, crane cylinders, bars of oil-pumping equipment, flanges, etc.

Final machining and welding of tubes are also produced for petrochemical industry and furnace radiant heaters.





PIPE FITTINGS PRODUCTION

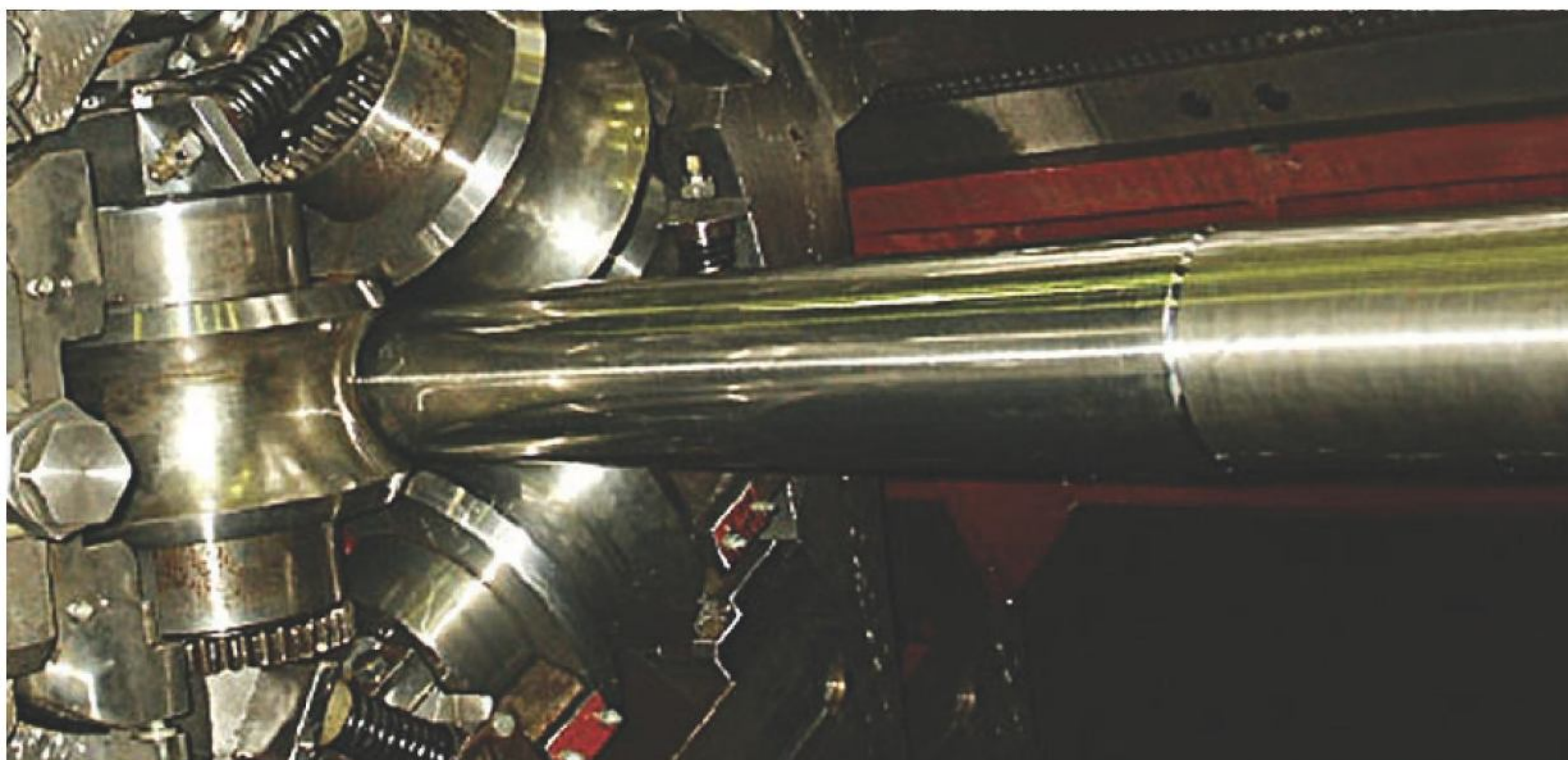
Pipe fittings production includes:

- wide stock of pressing equipment for production of seamless knuckle elbows, reducers, tees with outer diameter 22 to 630mm.
- equipment for expansion and welding of sections of fittings with outer diameter up to 1400mm.
- tube bending machinery for production of bent branches with outer diameter up to 630mm of radius from 1,5 DN;
- equipment for production of plate and weld neck flanges.

MILL PRODUCTS

Mill production is represented by three cold pilger mills within the ranges of 14-32mm, 25-55mm, 57-90mm and also the mill for straightening of tubes with outer diameter 14 to 89mm.

The major part of products is used in home manufacture of pipe fittings.





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HEAT-TREATMENT CELL

Equipment for heat treatment includes two-chamber gas furnaces with 20 ton charge weight of each one, 10 ton car bottom electric furnace, gas-heated soaking pit, stand for accelerating cooling of tubes.

We are able to perform annealing, normalizing, tempering, age-hardening, surface hardening.

Centrifugally-cast, cold-rolled tubes and shaped castings are heat-treated. We are able to perform surface hardening of products with weight up to 5 ton and outer diameter up to 320mm.

Heat-treatment of metals and alloys is a process of thermal conditioning of metal products which is aimed to restructure and to change properties in the intended direction. Heat treatment of steel products is performed in cases when either enhancement of hardening, strengthening, wear-resistance, flexibility of details and tools is necessary or making metal milder, more machinable. Different types of heat-treatment are applied depending on application – annealing, normalizing, quenching and tempering. Each type of heat-treatment consists of following operations: heating up to stated temperature; conditioning for end-to-end heating-up and ending of structural transformations; rapid or slow cooling. Rate and temperature of heating, soak time and cooling rate are determined by properties.





PRODUCTION OF VESSELS AND CAPACITIVE EQUIPMENT OF POLYMERIC MATERIALS

Polymeric materials production site is equipped with automatic assembly controlled by PLC with the length of contact weld seam up to 4000mm, and fitted with several manual welding equipment sets from leading global manufacturers, and device for butt-welding.

Vessels with capacity up to 150m³, which includes heat insulating, pickling and plating tanks with length up to 24m, special products.





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QUALITY CONTROL

Quality and reliability of products are the basis for successful co-operation.

Modern technologies and equipment, Quality Management System, complex tests and inspection of products provide its conformity with technical requirement of customers in compliance with the specifications TY; GOST; engineering documentation, standard specifications EN; DIN; ASTM; ASME.

The quality control is executed by the following methods:

- chemical analysis by spectral method with using of device SPECTROMAX with programming support, as well as by analytical method (arbitrary);
- control of macro- and microstructure;
- mechanical test by various temperatures;
- ultrasonic thickness measurement;
- liquid penetrant inspection;
- gas pickup testing;
- air pressure- and hydrostatic tests.





PRODUCTS

THE FOUNDRY PRODUCTS

Centrifugally-cast tubes of carbon-, structural-, high-alloyed-, stainless-steel-, heat-resistant- & high-temperatures steels are cast of 200 various grades of steel, alloys, cast iron, as well as of more than 35 bi-metallic combinations. Dimensions of tubes are as follows: diameter from 100mm to 1625mm, wall thickness from 7mm to 250mm, length up to 6250mm.

Tubes are supplied both as cast, with machined outer or/and inner surfaces, and with heat treatment as welded multiple-tube sections, as well as articles on the customer's specifications.

CENTRIFUGALLY CAST TUBES SCHEDULE

Outer diameter, mm	Wall thickness, mm		Length, mm	Notes
	min	max		
97-209	7	75	2200-3700	Outer diameter every 10-20mm
210-335	8	100	2600-4700	
336-425	10	140	2600-6250	
426-530	12	180	2600-4700	
537-649	15	200	2150-5600	Outer diameter every 15-30mm
650-779	20	200	2150-5700	
780-890	25	200	2150-4800	Outer diameter every 50mm
950-1060	25	210	2150-4800	
1060-1625	25	60	3900	There is being put together a set of metal molds now



Tubes are subject to NDT of soundness (continuity) and (strength) mechanical properties by methods:

- Ultrasonic flow detection with modern USC fault detectors UD2-70;
- liquid penetrant inspection;
- measurement of thickness of articles in the hard-to-reach places with ultrasonic thickness gauges;
- gas pickup testing.

The products collected the Russia and Byelorussia Certificates of Conformity.



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PRODUCTS FOR METALLURGICAL INDUSTRY

- Rollers for heat-treatment- and reheating furnaces with roller hearth, to be used by manufacture of hot-rolled sheets, tubes & pipes and other kinds of rolled steel. Rollers are manufactured of the steel grades 1.4541, 1.4841, 1.4845, GX48NiCrWSi48-28-5. Diameter of the roller shells from 140mm to 800mm.

- Roller for discharge roller tables by manufacture of cold-rolled sheets. Rollers are manufactured of low-alloyed iron. The diameter range of the roller shells is from 200mm to 340mm.

- Rollers for continuous casting machine (CC machine). Diameter range of the roller sleeves is within 180...340mm. There are manufactured both single-layer rollers of the steel grade 1.7034, 1.7225, 1.2311, 1.6582, 1.4057, and more wear-resistant bimetallic ones with outer layer of the steel grades 1.2379, 1.4028, inner layer of the steel grades 15CrMoV5-9, 1.7733, 1.2311, 1.0528.

- Shells of the coke crushers of diameters up to 950mm of the steels 66Mn4, 1.3401.

- Drums for hot dipped galvanizing lines of the Steel 1.4429.

- Coilers of diameters up to 600mm of the steel St 52 for the lines to manufacture foils.

- Containers of the steel 1.2542 for the tube extrusion plants.

- Slitters of the steels 1.2542 and 60WCrV7 for tube-welding mills and slitting assemblies.

- Hollow shafts and forming profile rollers for the sheet steel profiling lines.

- Radiant tubes for the heat-treatment furnaces with controlled atmosphere (U-shaped, W-shaped, P-shaped). The tubes diameter range is within 100...280mm. Steels to be used: 1.4841, 1.4845, GX48NiCrWSi48-28-5.

- Hollow billets of alloyed grades of steel of the range within 130...550mm for fabrication of tubes by means of forging, on the skew rolling mills, pilger mills and tube-extrusion assemblies, ring reeling machines.



- Ingot molds. They are manufactured of grey and alloyed irons with heat treatment and machining. Outer diameter to be up to 1066mm.

- Cast details of heat-resistant steels for heat-treatment furnaces: hot riders, beams, bars, lining plates, stands, baskets, muffles, retorts.



PRODUCTS FOR HARDROCK MINING INDUSTRY

- Bi-metallic centrifugally-cast tubes of the diameter range from 168mm to 1060mm with inner wear-resistant layer for the pulp ducts for hydraulic conveying of coal, ores, sand, diamond-containing pulp; mud lines; dust- and gas ducts. Service life of such tubes is more than 10 times longer than the service life of welded and seamless tubes of carbon steels conventionally used for pulp ducts. Tubes are manufactured according to the Specifications TU U 27.2 – 13419172 – 002:2008.

- Crusher rolls of wear-resistant steels.





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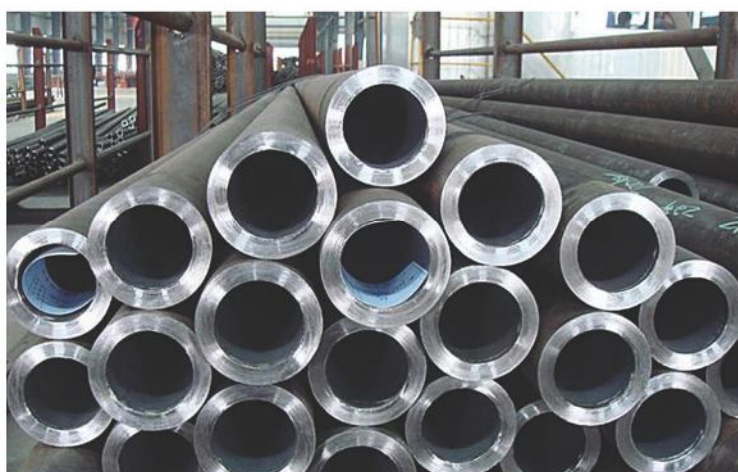
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PRODUCTS FOR MACHINE-BUILDING INDUSTRY

- Electric- and gas radiant heaters: single-ended, U-type, W-type – for assemblies of heat treatment and thermo-chemical treatment. Material: 1.4841, 1.4805, GX48NiCrWSi48-28-5.
- Furniture of pit-type for thermo-chemical treatment, type, Ts-105, Ts-75, Ts-60: retorts, crucibles, muffles, basket shells, basket bottoms, diffusers, etching troughs, props, crosspieces, grids, retorts of endothermic generators. Material: GX35CrNi25-12, 1.4841.
- Equipment for the chamber- and through-type thermal assemblies, type SNTsA, SNTs, SNO, SNZ, STOA, SNZM, «Pekat», «Ipsen», «Degussa», «Holkroft»: dampers, molding beds, balls for recuperators, racks, impingement plates, strips, beams, sleepers, rollers, hearth plates, lining plates, angles, sills, guides. Material: 1.4805, GX48NiCrWSi48-28-5.
- The centrifugally cast tubes as blanks for manufacture bodies of hydraulic cylinders, valves, including ball valves, casings of electric motors of low-carbon steel with minimal losses from ground currents, pump casings, compressors, expanders; gear crowns and gears, rings, including those ones used for manufacture of the big-size bearings, bushings, flanges, hollow shafts, press molds, sleeves for combustion engines; crane- and brake drums, stators of gas turbines, parts for turbomotors and auxiliary facilities; pressure vessels; heavy-walled fittings and offshore platforms; columns of presses, pillars of manipulators, tube trusses, bucket beams for excavators, plunger cylinders.





PRODUCTS

FOR POWER GENERATING INDUSTRY

- Tubes for steam lines of TPS and APS of diameter range within 630-920mm, heat-treated and machined, manufactured in compliance with the Specifications TU 108-874-95. Material of the tubes: P275N и 15CrMoV5-10.
- Nozzles and bodies of burners for thermal power stations of diameter up to 1625mm. Material: 1.4841, 1.4845.



PRODUCTS

FOR PETROCHEMICAL INDUSTRY

- Centrifugally cast tubes of heat-resistant- and corrosion-resistant steels and alloys (TMA4700, GX45NiCrCoW35-25-15-5, KHR35W, GX48NiCrWCo48-28-5-3, Mo-Re21, 1.4841, GX48NiCrWCo48-28-5-3, 1.4855, 2.4872), being used in the constructions of pipe coils of pipe-type furnaces of installations for production of carbon disulfide, ammonia, ethylene, hydrogen, of diameter up to 320mm. The tubes are manufactured according to the Specifications TU 1333- 159-00220302-2011.
- Shaped castings (fittings) of heat-resistant- and corrosion-resistant steels and alloys (TMA4700, GX45NiCrCoW35-25-15-5, KHR35W, GX48NiCrWCo48-28-5-3, Mo-Re21, 1.4841, GX48NiCrWCo48-28-5-3, 1.4855, 2.4872, being used in the constructions of pipe coils of pipe-type furnaces of installations for production of carbon disulfide, ammonia, ethylene, hydrogen, of diameter up to 320mm. The tubes are manufactured according to the Specifications TU 1333- 159-00220302-2011.



SEAMLESS

COLD-STRAINED PIPES

At the R&PC «Trubostal» there are manufactured seamless cold-strained pipes in accordance with GOST 8734-85 of carbon grades of steel. Outer diameter range from 14mm to 102mm, wall thickness range from 1.2mm to 10mm.



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PRODUCTS FOR BUILDING & CONSTRUCTION INDUSTRY

• Tubes of weldable low-alloyed constructional steels. They are used as piles, props and load-carrying structures by building of bridges, viaducts, dams, piers, metal structures of high-rise buildings, heavy loaded platforms of subways, railroad stations, stadiums, installations for the ocean mining of oil. Tubes are notable with improved corrosion resistance and unique seismic resistance. An OD range is within 406-1020mm, wall thickness range – 22-60mm.



NORMATIVE DOCUMENTS FOR CENTRIFUGALLY- CAST TUBES

The normative documents being in use for centrifugally cast tubes and materials of which they are manufactured:

- TU U 27.2-13419172-002:2008
 - TU U 27.2-13419172-001:2007
 - TU 108-874-95
 - GOST 977-88
 - ASTM A216
 - ASTM A217 / A217M-91
 - ASTM A351
 - ASTM A352
 - ASTM A426-80
 - ASTM A451-92
 - ASTM A494
 - ASTM A530-81
 - ASTM A660-96
 - ASTM A757-81
 - ASTM A743
 - ASTM A744
 - ASTM A890
 - DIN 1681-85
 - DIN 17182
 - DIN 1690
 - DIN 17205
 - DIN 17245
 - DIN 17255
 - DIN 17465
 - DIN EN 10217-7
- and others.





FITTINGS

We manufacture fittings for pipe-lines of low, middle and high pressure being used by conveying of oil and gas, steam and hot water, chemically aggressive substances and others.

- Elbows we manufacture are both seamless, welded and stamp-welded of the steels 1.0038, 1.040220, 13Mn6, 1.0570, 1.4301, 1.4541, 1.4571, 1.7362 and others according to GOST 17375-01; GOST 30753-01, OST 34-10-419-97; OST 34-10-699-97; OST 34-10-418-90; OST 34-42-663-85; OST 34-10-752-97; DIN 2605-1, ANSI B16.9 Specifications TU U 27.2-13419172-005:2009; TU 102-488-95; TU U 24.2-13419172-008:2013 and others.
- Bends with radii of curvature from 1.50 up to 50 of the steel grades 1.0402, 1.0426, 1.7362, 1.7715, 13Mn6, 1.4301, 1.4541, 1.4571 and others according to GOST 22793-90; Specifications TU 102-488-95; OST 108.321.11-25-82; OST 34-10-420-90; Specifications TU U 24.2-13419172-008:2013 and others.
- Reducers concentric (eccentric) stamped, stamp-welded, welded, turned of the steels 1.0038, 1.0402, 1.4301, 1.4541, 1.7362, 13Mn6, 1.0570 and others according to GOST 17378-01; GOST 22826-83; TU 102-488-95; OST 34-10-700-97; OST 34-10-753-97; OST 34-10-422-90; OST 108.318.11-25-82; TU U 24.2-13419172-008:2013, DIN 2616-11, ANSIB16.9 and others.
- Tees stamped, stamp-welded, welded, turned of the steels 1.0038, 1.0402, 1.4301, 1.4541, 1.7362, P275N, 13Mn6, 1.0570 according to GOST 17376-01; TU 102-488-95; OST 34-42-762-85; OST 34-42-764-85; OST 108.104.02-20-82; GOST 22822-83; OST 108.720.01-07-82; TU U 24.2-13419172-008:2013 and others.
- Angle pipes, tees, reducers, hose nipples turned of the steel grades 1.0402, 13Mn6, 1.4301, 1.4541 according to GOST 22820-89; GOST 22822-89; GOST 22826-89; GOST 22792-89 and others.
- End caps, end plates, 1.0038, 1.0402, 1.4301, 1.4541, P275N, 1.7362, 13Mn6, 1.0570 according to GOST 17379-01; TU 102-488-95; TU U 24.2-13419172-008:2013; GOST 6533-78; OST 34-10-758-97; OST 34-10-459-97, DIN2617-1, DIN28011, ANSI B16.9.
- Flanges, blind flanges stamped, turned of the steels 1.0402, 1.4301, 1.7362, 13Mn6 according to GOST 12820-80; GOST 12821-80; GOST 9399-81; ATK 24.200.02.90, EN 1092-1, DIN 2632, DIN 2633, DIN 2634, DIN 2635.



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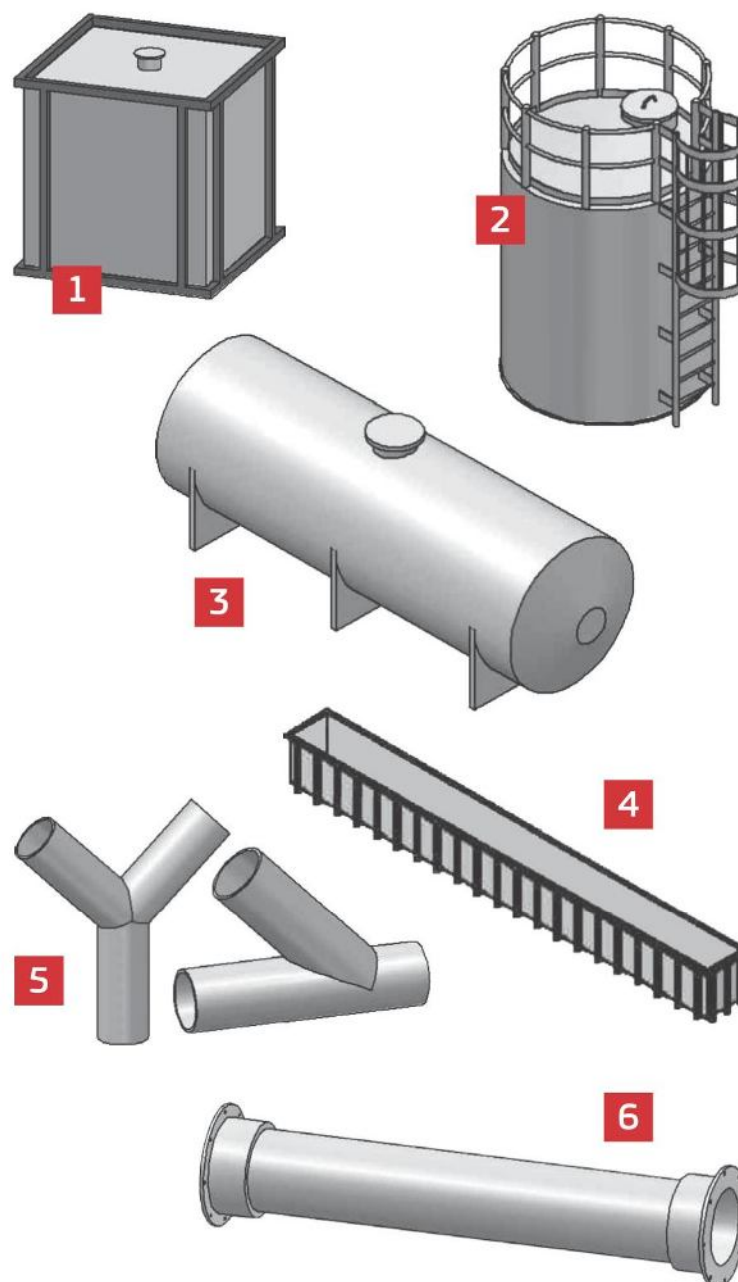
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ARTICLES OF POLYMERIC MATERIALS

Based on the many-years' international experience of the polymers use, our company manufactures industrial tanks and special equipment of thermoplastics in compliance with the Specifications TU U 25.2-13419172-003:2008 (general industrial tanks) and TU U 25.2-13419172-004:2008 (tanks for food-processing industry).

High corrosion- and chemical resistance (including to chlorine-containing materials) in combination with lower cost allow successfully use our products instead of conventionally used tanks of stainless steels, tanks of steel lined with bricks, providing by that higher, in comparison with mentioned analogues reliability, endurance, ease and operating economy.



CATALOGUE OF POLYMERIC EQUIPMENT (polyethylene, polypropylene)

1. **TANKS** rectangular multipurpose (size from 1m^3 to 10m^3)
2. **TANKS** cylindrical, vertical installation, thermos bottles, (size from 1m^3 to 150m^3)
3. **TANKS** cylindrical, horizontal installation (size from 1m^3 to 60m^3)
4. **BATHS** electroplating, pickling, etc. (size from 1m^3 to 80m^3)
5. Special **COMPONENTS** of pipe-lines (fittings) (032mm – 0630mm)
6. Gravity-flowing **TUBES** and **COMPONENTS** for gravity-flowing ducts, including flanges, reducers, tees, etc. (dimensions to be agreed).



CONTACTS

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