IZHORSKIYE ZAVODY

Izhorskiye Zavody today is a modern machine-building company designing and manufacturing equipment for fuel and energy industry, petrochemical, metallurgical and other industries.

Izhorskiye Zavody is one of the oldest industrial enterprises of Russia. It was founded in 1722 by Decree of Peter the Great. For these years Izhorskiye Zavody added new chapters to the history of Russia: establishment and development of Russian Navy, construction of Saint-Petersburg, defense of Leningrad in World War II, creation of Russia's first pressurized water reactor.

Almost three centuries of IZ's history are closely connected with constant progress of technology and manufacture of original products. The achievements in these fields became possible due to the highest professionalism of IZ workers and engineers.

For these centuries elite of engineers and workers was formed on the banks of river Izhora. It is their efforts that turned IZ to become a famous Russian enterprise and approached the world market.

Nowadays Izhorskiye Zavody is a modern machine-building enterprise, designing and manufacturing equipment for nuclear power plants, high energy physics researches, products of basic engineering industry, chemical and petrochemical engineering industry.

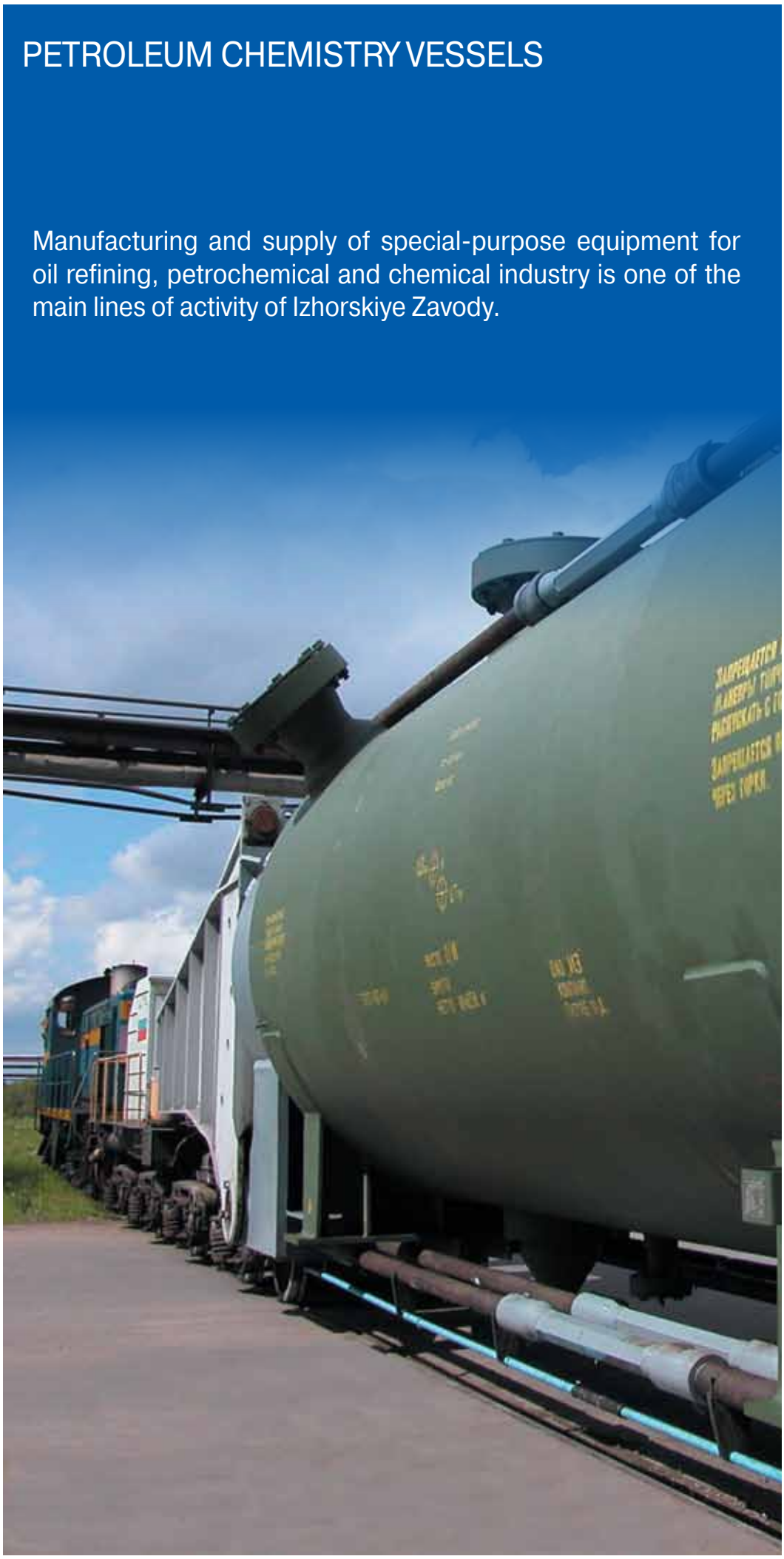
Powerful production capacities, science and technology combine, qualified personnel made it possible to manufacture a wide range of products.

Izhorskiye Zavody manufacture and design:

- vessel type primary circuit facilities for NPP with pressurized water reactors;
- facilities for transportation and storage of spent nuclear fuel;
- facilities for oil refining, petrochemical and chemical industries

PETROLEUM CHEMISTRY VESSELS

Manufacturing and supply of special-purpose equipment for oil refining, petrochemical and chemical industry is one of the main lines of activity of Izhorskiye Zavody.



DESIGN OF PETROLEUM CHEMISTRY VESSELS




Izhorskiye Zavody specialize in engineering and manufacturing of oil and gas processing equipment: reactors, towers, heat exchangers, tanks of up to 5,5 m diameter, up to 80 m long and weighing up to 1450 t.

We have gained experience and explored new technologies in the production of vessels and pipelines for nuclear power facilities operated under conditions of high pressure and high temperatures, under cyclical, mechanical, seismic loads and influence of aggressive media. This experience and proven technology made use in designing and manufacturing of a wide range of pressure vessels of different intended application, weight and size. The experience gained in the production of high quality items for NPP gives competitive advantages to Izhorskiye Zavody in the market of petrochemical equipment and enables to accomplish any challenging orders at a top-quality level.

Within recent years IZ have designed and manufactured more than 150 vessels including those with special weight and dimensions.

The list of petrochemical, chemical and gas-processing equipment, produced by Izhorskiye Zavody comprises:

- hydrocracking, reforming, hydrofining, hydrogenation reactors etc.;
- towers: separation columns, separators, absorbers, desorbers, receivers, scrubbers, dividers, catchers, filters;
- heat exchangers;
- gas tanks, liquid hydrocarbon –storage tanks;
- autoclave presses.

Izhorskiye Zavody manufacture equipment for projects under construction and participate in renovation and modernization of operating plants of Oil and Gas Processing Facilities.

Advanced and well-developed engineering base is a competitive advantage of the Company. It is supported by close cooperation with the leading Russian scientific and research centres and developing agencies, such as:

VNIPIneft,
Lengiproneftekhim,
VNIIneftemash,
VNIIneftekhim,
IrkutskNIIkhimmash,
LenNIIkhimmash,
“Prometheus” Research Institute etc..

In-house engineering is a basis for implementation of a package approach to development of optimized solutions over all processing chain from receipt of request for proposal, development of package of technical documentation to repair and revamping of oil refining and gas processing facilities, enterprises of chemical and petrochemical industry.

A well developed engineering base and park of advanced procuring, machining, assembly and welding, heat treatment and testing equipment make it possible for Izhorskiye Zavody to provide stable quality when manufacturing vessels with diameter up to 5,5 m, length up to 80 m and weight up to 1400 tons.

Design and analyses are carried out in accordance with requirements of Russian state standards and ASME Code. To substantiate strength, reliability and safety of equipment a set of analyses for temperature and stress-strained state of equipment etc. is performed.

PETROLEUM CHEMISTRY VESSELS

Izhorskiye Zavody is Russia's sole manufacturer, featuring a perfect wedding of high quality steel manufacture and highly developed machine building.

MANUFACTURING TECHNOLOGY OF PETROLEUM CHEMISTRY VESSELS




A unique combination of engineering capabilities, scientific potential and many years' experience in manufacturing of semifinished material enables the Company to hold leadership positions in Russian and CIS' markets and to be one of the largest forgemasters in Europe. Metallurgical capacities of Izhorskiye Zavody cover steelmaking and press forging.

Manufacture of steel is carried out by using ДСП-120 T Electric Arc Furnace (EAF). This is a novel, heavy –duty steel-melting furnace of late production. The productive capacity of the furnace is more than 250 tons per year and it enables to tap heats weighing from 70 to 140 tons. This makes it possible to enlarge the range of melted steel grades, increase the metal production volumes and enhance the quality of large ingots. ДСП-120 T EAF was put into operation in June 2009.

The quality of steel is ensured by ladle furnace treatment using liquid -steel degassing, refining, electroslag remelting and vacuum-arc remelting techniques.

The press forging facilities include a wide range of forging machinery, forging cranes and forging manipulators of adequate load-carrying capability. The largest Russian automated forge-and-press complex (AKK-12000) of 120MN (12000 ton-force) capacity makes it possible to produce heavy forgings weighing up to 230 t and having up to 5.5 m diameter.

Heat-treatment machinery enables to obtain the metal grain pattern, ensuring high operational properties of the products. Heat treatment of forgings is carried out in heat-treatment, open gas, batch-type, car hearth furnaces of carrying capacity up to 800 t. Both water quenching and oil quenching is ensured. Electrical shaft furnaces are used for upright heat treatment of long blanks. Water quenching and oil quenching applies as well. The depth of vertical quenching tanks is up to 30000 mm.

A unique combination of production capacities, production processes and "know-how" results in:

- casting of forging ingots weighing up to 420 t, including vacuum-cast ingots weighing from 15, 3 to 360 t;
- casting of electroslag ingots weighing up to 63 t;
- casting of vacuum-arc melted ingots weighing up to 41,1 t;
- manufacturing of forgings weighing up to 230 t, forged shafts of up to 21 m long, forged shells up to 5,5 m in diameter;
- manufacturing of large-sized bilayered and three-layered sheets and plates of up to 450 mm;
- performance of quality heat treatment;
- availability of all types of nondestructive tests, any chemical analyses, macrographic examination, mechanical testing of articles according to Russian state standards and the Customers' national standards.

IZ have got extensive experience in manufacturing of large-sized bilayered and three-layered sheets and plates for critical components.

Bilayered and three-layered plates are produced according to the in-house practice by nonsymmetrical pack rolling.

PETROLEUM CHEMISTRY VESSELS

Experience accumulated by Izhorskiye Zavody and proven technologies made use in designing and manufacturing of a wide range of different purpose pressure vessels featuring the performances that meet the Customers' most stringent requirements in terms of high reliability, strength and durability.

MANUFACTURING TECHNOLOGY OF PETROLEUM CHEMISTRY VESSELS




Pressure vessels intended for oil refining, petrochemical, chemical, gas processing, gas and other industries exemplify IZ's flexibility in terms of production diversification

Performance	Delivery to worksite	
	by rail	by waterway
external diameter, mm	4500	5500
wall thickness, mm, up to	450	450
length, mm, up to	30000	80000
design pressure	not limited	not limited
design temperature, ˚C	from - 70 to +600	from - 70 to + 600
weight, t, up to	400	1450

Carbon, silicon-manganese, low-alloy CrMo and CrMoVa corrosion resistant high-alloy steel grades are used for manufacturing of vessels. IZ have experienced in manufacturing vessels from bilayered plates. Furthermore, high quality steel of different grades is used both according to Russian state standards (GOSTs) and according to ASTM, ASME, JIS, EN, NFA, BS, DIN, SEW etc.

The variety of requirements for pressure vessels is met including purity of materials in terms of detrimental impurities, characteristics of mechanical properties, absence of intolerable flaws, equal strength of welded joints and the base metal proved not only by short-term testing but also with regard to service life of equipment.

Machining facilities available at Izhorskiye Zavody enable to machine articles with diameter up to 12 m, 7 meters high and weight up to 400 tons.

Modern welding facilities and technologies enable IZ to perform any type of welding including narrow gap welding of parts with large thickness, welding-on of nozzles as well as weld overlaying with inner anticorrosive layers including small diameter pipes.

Heat treatment of large size parts is carried out both in stationary furnaces with electric and gas heating and by local heat treatment plant providing specified uniformity of temperature field.

Local heat treatment technology enables to fabricate articles of any length.

Advanced research and technology level and reliability of equipment provide for flexible tailoring to Customer's requirements and high long-term competitiveness of petrochemical equipment in Russian and global markets.

Quality Assurance System covering all stages of manufacturing cycle is a guarantee to the effect that all projects are developed and manufactured in accordance with the predetermined specifications.

REFERENCES

Izhorskiye Zavody is Russia's sole manufacturer of oversize capacitance equipment for petrochemical industry weighing up to 1450 t, using in-house metal manufacture.

VESSELS MANUFACTURED ACCORDING TO ASME CODE

Designation	Material grade	Overall dimensions	Wall thickness mm	Weight, t	Customer	Licensor
Reactor 10-ДС-101	SA-387 Gr22 Cl.2 SA-336 F22	H=40400 D inside=4300	205	843	Lukoil -Permnefte-orgsyntez	ABB Lummus Global
Reactor 10-ДС-501	SA-336 F22	H=17160 Dinside=3400	165	225		
Reactor 10-ДС-502	SA-336 F22	H=20000 Dinside =3000	135	209		
Reactor P-1001,	SA-336 F22 SA-387 Gr22 Cl.2	H=39000 D inside =2700	113	290	TNK-BP (Ryazan Refinery)	Chevron Texaco
High Pressure Hot Separator	SA-336 F22 SA-387 Gr22 Cl.2	H=16520 Dinside =3000	102	102		
Hydrofining Reactors 3R-2001 and 3R-2002	15X2МФА+347SS	H=29370 D inside =5500	211	718	Lukoil-Nizhegorod-nefteorgsyntez	AXENS
Hydrofining Reactors R-0101 and R-0102	SA-336 A22	H=35700 D inside =4600	255	1161	TANECO	Chevron Texaco
Hydrofining Reactor R-1001	SA387	H=16 500 Dinside=1700 mm	40	37	NAFTAN	HALDOR TOPSOE A/S
Gasoline Hydrotreatment Reactor R-1002	SA387	H=38700 D inside=3500	40	80	NAFTAN	HALDOR TOPSOE A/S
Diesel Oil Hydrotreatment Reactor P-201	SA387	H=30500 D inside=1 850 mm	85	270	NAFTAN	ALBEMARLE
Diesel Oil Hydrotreatment Reactor P-201	SA387+SA240	H=39000 D inside=3200 mm	75	230	NAFTAN	HALDOR TOPSOE A/S

REFERENCES

Izhorskiye Zavody became Russia's first enterprise that was granted in 1922 Bureau Veritas Quality International (BVQI) Certificate of Compliance of Quality Assurance System to ISO 9001 Standard.

REACTORS MANUFACTURED ACCORDING TO RF ROSTEKHNADZOR'S (RUSSIAN TECHNICAL INSPECTION BODY) REGULATORY REQUIREMENTS

Description	Designation	Material grade	Overall dimensions, mm	Wall thickness, mm	Weight, kg	Year of manufacture
Reactor РГЯ	5101.92.00.000	12ХМ with weld overlay 8Х18Н10Г2Б	H= 6400 D inside = 2200	90	30400	1994
Hydrocracking Reactor	5002.11.00.000	15Х2МФА	H = 22880 D inside = 3200	175	290000	
Hot Separator	5103.04.00.000	12ХМ +08Х18Н10Т	H = 8445 D inside = 3000	75	57100	1994
Hydrofining Reactor (Parex -2M Installation Reactor)	5101.37.00.000	12ХМ+08Х18Н10Т	H = 10260 D inside = 2800	100 with weld overlay	73200	
Hydrofining Reactor Р-201	5103.21.00.000	12ХМ+08Х18Н10Г2Б	H = 7000 D inside = 1600	25	14500	1994
Reactor РРБФБ-10	5102.41.00.000	12ХМ	H = 7385 D inside = 2350	112	45400	1992
Hydrofining Reactor	5101.69.00.000	12ХМ+08Х18Н10 09Г2С	H = 11820 D inside =3600	110	133000	1991
Benzol Recovery Reactor (Reactor Р-201)	5101.51.00.000	15Х2МФА	H = 9715 D inside = 2600	70	39200	1991
Benzol Recovery Reactor (Reactor Р-202)	5101.52.00.000	15Х2МФА	H = 11870 D inside = 2600	70	49100	1991
Benzol Recovery Reactor (Reactor Р-203)	5101.53.00.000	15Х2МФА	H = 14645 D inside = 2600	70	63200	1991
Reactor РГДТ-24	5101.55.00.000	12ХМ	H = 11970 D inside = 3600	110	119000	1990
Р-2 Reforming Reactor Vessel of Л-35-11/300 Installation	5104.41.00.000	10Х2М1А-А	D inside = 2200 H = 6027	85	35000	2003
Vacuum Gasoil Hydrofining Reactors РГМ-107М(У)	5104.61.00.000	15Х2МФА	H = 20030 D inside = 3600	130	230000	2008
Hydrofining Reactors 3-R2001 and 3-R2002	5002.55.00.000 5002.56.00.000	15Х2МФА	H = 31400 D inside = 5500	210	720000	2009

QUALITY




Trade mark of Izhorskiye Zavody is well known in the market of high-tech machine-building products. IZ traditions of quality and reliability were formed during almost three centuries.

The main goal in quality is to meet Customers' needs and expectations in delivery of engineering products that must be competitive in the market of Russia and global market and correspond to legislative and normative acts in terms of quality, reliability and safety.

Izhorskiye Zavody became Russia's first enterprise that was granted in 1922 Bureau Veritas Quality International (BVQI) Certificate of Compliance of Quality Assurance System to ISO 9001 Standard.

At present time Quality Management System (QMS) is functioning at IZ corresponding to requirements of the International Standard ISO 9001:2008, certified by Bureau Veritas and GosStandard of Russia.

Izhorskiye Zavody carry the following certificates:

- No. RU 227553 of 27.11.2009

  Certificate of compliance with the International Standard ISO 9001:2008, issued by Bureau Veritas Certification with validity till November 26, 2012;

- No. РОСС RU.ИСО9.К00901 of 14.01.2010

  Certificate of compliance with the National Standard GOST P ИСО 9001-2008, issued by the Quality System Certification Body TEST – S.-Petersburg LLC with validity till January 14, 2013.

- No. RU-Q00901 of 14.01.2010

  Certificate of compliance with the International Standard ISO 9001:2008, issued by IQNet with validity till January 14, 2013.

- No.36.093 and 36.094 of 09.10 2009

  Certificates of Authorization for manufacture of pressure vessels with the stamps U and U2 in compliance with ASME Code (American Society of Mechanical Engineers) with validity till January 11, 2012.

Compliance of IZ QMS to the requirements of the Standard ISO 9001 is annually inspected by leading auditors of BVC and auditors of TEST – S.-Petersburg LLC.

Quality Management System guarantees to Customers provision of the specified quality standards at all production stages from designing to mounting works as well as after-sale services.

Personnel is permanently trained and qualified to attain and maintain the required qualification and experience in the field of practical work and advanced management methods.