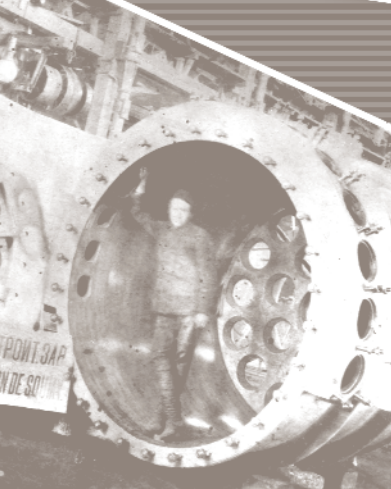
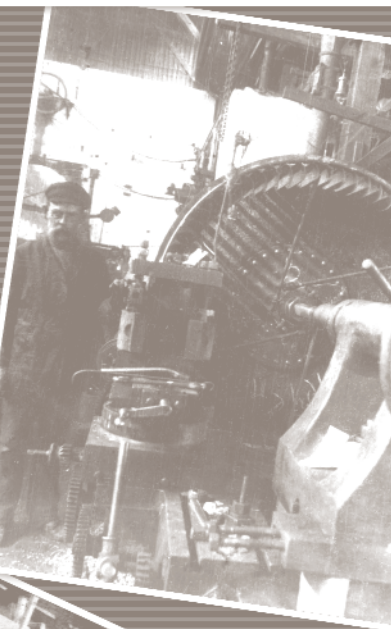
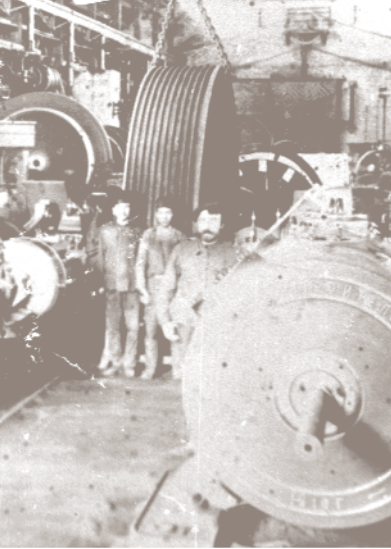


JSC "Sumy Frunze  
Machine-Building  
Science and Production  
Association"

[www.frunze.com.ua](http://www.frunze.com.ua)



## BRIEF HISTORICAL NOTE:

- 1896 Belgian Joint Stock Company "Sumy Machine-Building Shops" was established.
- 1900 – 1902 Evaporators, filtering and beet presses for sugar refineries were launched into production.
- 1908 Manufacturing of the first domestic steam engines for sugar refineries.
- 1914 The enterprise changed over to mastering of military output. Exploders workshop was built; equipment for gunpowder factories was launched into production.
- 1922 – 1924 Reconstruction of revolutionary events aftermath was completed and pre-revolution production level was reached.
- 1929 Electric arc welding was mastered for the first time in Ukraine.
- 1930 – 1931 The enterprise specialized in manufacturing of equipment for Chemical and Oil branches of industry. Pump-and-compressor, foundry and tool workshops were constructed.
- 1933 The first domestic highpowerful piston compressor with the capacity of 10000 m<sup>3</sup>/h was manufactured.
- 1933 – 1934 Welding of nickel and chrome-nickel steels was mastered. Welded chemical equipment made of these types of steel was launched into production.
- 1935 The first specialized workshop producing centrifuges was constructed in the country.
- 1936 – 1940 New equipment, including the unique superpowerful nitrogen-hydrogen compressor with pressure of 850 atm. was manufactured for Chirchik Chemical Integrated Works.
- 1941 – 1944 The enterprise was evacuated from Ukraine; Military orders fulfillment for war needs.
- 1948 The company was reconstructed. The company was awarded Lenin Order for contribution to national machine-building development.
- 1950 – 1959 Equipment for the new branch of national economy - atomic industry - was launched into production. The plant also fulfilled the orders for space exploration purposeful programs.
- 1951 – 1958 The output of more than 35 new machines and devices including five-stage compressor, automatic centrifuges, rotary vacuum pumps for the chemical industry was mastered. The enterprise emerged in the world market.
- 1960 The first heavy-duty opposite compressor was launched into production in the country.
- 1964 The enterprise was awarded the Red Banner of Labor Order of the People's Republic of Bulgaria for technical assistance in the construction and assembly of the nitrate-fertilizer plant and Moriza-Vostok Heat Power Plant at Stara Zagora.
- 1966 Based on the heavy-duty compressors workshop Sumy Compressor Plant was founded.
- 1969 – 1979 New types of products were mastered. Complete process lines and units for mineral fertilizers, ethylene and helium production were supplied for the first time in the country. The enterprise was awarded the October Revolution Order.
- 1976 Sumy Machine-Building Production Association, including Sumy Frunze Machine-Building Plant, Sumy Heavy-Duty Compressor Plant, Construction Department, was established.
- 1976 – 1977 Improved gas turbine driven centrifugal compressor packages (GPA) GPA-C-6.3 of modular design with aircraft drive and capacity 6300 kW was launched into serial production.
- 1980 Nuclear-Power Machine-Building Plant was incorporated to the Association.
- 1981 GCN-195M-type reactor coolant pumps and Nuclear-Power Plants second circuit pumps were launched into serial production.
- 1982 Modern powerful GPA-C-16 units of modular design with aircraft drive and capacity 16,000 kW were launched into serial production.
- 1985 All-Union Scientific Research and Design Technological Institute of Compressor Machine-Building was incorporated to the Association. The enterprise became to be named "Sumy Frunze Machine-Building Science and Production Association".
- 1987 CNG compressor stations for vehicle refueling were launched into production.
- 1988 Italian Company "Danieli and Co" constructed for the Company the factory manufacturing drill collars and Kellys for oil and gas industries.
- 1994 Based on the enterprise Joint Stock Company was founded.
- 1997 The company was granted the ISO 9001:1994 quality certificate.
- 1999 – 2011 Turnkey complex objects for gas-condensate fields and gas pipelines were commissioned in Russia, Azerbaijan, Kazakhstan, Uzbekistan, Turkmenistan, Turkey, Iran and Ukraine. The company implements introduction of new types of products for different industries.
- 2001 – 2011 Structural reforms of the company. Construction and repairing of manufacturing workshops and facilities. Implementing of program of technical modernization and equipment renewing.



ВЪСШІЯ СЪВѢТЪ  
ПОДЪ НАДЗОРЪМЪ  
СЪСКИХЪ МАШИНОСТРОИТЕЛЬНЫХЪ  
МАСТЕРСКИХЪ  
(АНОНИМНОЕ СЪВѢЩЕВО)

ОТДѢЛЪ ТОВАРОВА  
11 ИЮЛЯ 1901  
№ 3388

№ 30055  
10 ИЮЛЯ 1901 / 7002

Его Высочайшему Государственному  
Министру Финансовъ



А.И. БЕРОУНСКИЙ  
первый директор-распорядитель

...наше доброе дело  
Высочайшему Государственному  
Министру Финансовъ  
...нашего Общества  
...Директора  
...основных  
...нашего  
...нашего  
...нашего



П.И. ХАРИТОНЕНКО  
один из основных учредителей  
Бельгийского акционерного общества

УКАЗЪ ЕГО ИМПЕРАТОРСКАГО ВЕЛИЧЕСТВА  
САМОДЕРЖЦА ВСЕРОССИЙСКАГО, Имъ Правительствующаго Сената  
Министру Финансовъ

По указу ЕГО ИМПЕРАТОРСКАГО ВЕЛИЧЕСТВА, Правительствующаго Сената слушавъ  
рапорты Министра Финансовъ отъ 23 Ноября 1896г.  
за № 7866, при коемъ представляется въ Правитель-  
ствующій Сенатъ подлинныя Высочайше утвержде-  
ныя в 15 день Ноября 1896г. условия деятельности  
въ Россіи Бельгийскаго акціонернаго общества подъ на-  
именованіемъ: Сумскія машиностроительныя ма-  
стерскія (анонимное общество). Приказами Ви-  
шеупомянутому Высочайше утвержденнымъ услови-  
ямъ прилагатся въ установленномъ порядкѣ. О чемъ  
Копію Сенатской Типографіи дать извѣстіе, а  
Министру Финансовъ уведомить указомъ Декабря  
5 дня 1896г.  
За Оберъ Секретаря *Л. Шенниковъ*



# 1901







JSC Sumy Frunze NPO is a machine-building company with complete process cycle - from generation of ideas to turnkey supply and further technical servicing of delivered products

**The key link in the idea-result chain is the company's research and development center, which comprises specialized design and process engineering sectors, research and testing laboratories with modern computer and measuring equipment.**

We employ leading technical experts with scientific degrees of Ukraine and the CIS in compressor and pump engineering, welding, metal cutting, etc.

JSC Sumy Frunze NPO holds the know-how and patented licenses on hundreds of technical solutions in design and manufacturing of its products. Its strong creative ties with dozens research institutions of the Science Academies of Ukraine, Russia and other CIS countries provide for a high level of engineering.

The company has highly developed metallurgical, blanking, welding and assembly facilities. Their technical level meets the highest quality requirements.

The powerful **metallurgical sector** is equipped with automated complexes for continuous casting and vacuum-oxygen decarburization of steel, which produce high-alloy steels in casts weighing up to 18 tons. It operates modern casting and press-forging equipment, which provides the enterprise with all necessary kinds of molded, forged and stamped materials.

**The blanking sector** uses unique equipment:

- Highly effective Messer Griesheim, Trumpf, Bystronic CNC gas-cutting machines and plasma-arc cutting machines;
- Flanging machine for making 1,800 mm—4,000 mm elliptic and box bottoms;
- A Häusler molding and profile-bending machine for making coil pipes, optical compensators and semi-tubular jackets;
- Asano Seiki profile-bending machines for making flanges by cold bending strips;
- There are special workshops for manufacture of cold-rolled, arc-welded and bimetallic tubes and aluminum profiles.

**The mechanical assembly sector** operates a tremendous stock of 1,500 units of up-to-date metal machining facilities, including unique machine-tools and automatic machining CNC-centers produced by the world leading machine-tool builders Dörries, Forest, Innse, Max Müller, Waldrich Siegen, Safop, Mekof, Kolb, Pfauter, Höffler, etc. Rotors and other parts are balanced at Schenck high-precision balancing machines and vacuum chambers.

Unique test bench complex allows to implement full-load string tests of all units and aggregates parameters, and to provide shipping of equipment, construction and commissioning on turnkey basis to customer.

**The welding sector** widely employs robotic, automatic and mechanized welding machines, test benches and equipment of Fronius, IGM, ESAB, Polisoud, Deuma companies.

A great range of welding and buildup methods is applied: automatic submerged-arc welding, electroslag welding, electron -beam welding, automatic and mechanized gas-shielded welding with solid and flux-cored wires, orbit argon-arc welding with non-consumable electrode of connections "tube + tube" and "tube + tube sheet", high-frequency welding during manufacture and finning of tubes, seam and spot contact welding, friction welding, explosion and strip electrode fusion cladding. Related technologies are widely introduced, and namely: vacuum soldering, plasma-arc cutting and welding, metallizing and metal strengthening: gas-heat, plasma, electric-arc, vacuum and detonation.

**The company is implementing a large-scale program of technical modernization aimed at renewing the metal-cutting, boiler-welding, and other equipment.**









JSC Sumy Frunze NPO  
guarantees supplies  
of complete sets  
of equipment and turnkey  
construction of industrial  
facilities



JSC Sumy Frunze NPO designs and builds main and auxiliary equipment based on customers' demands and specifications, including technical and economic parameters, climatic and seismic conditions in the operation area. All civil, construction, installation, erection, pre-commissioning and commissioning works, training of customer's personnel, warranty and post-warranty services are provided by the company based on customer requirements.

Lately the company has constructed and is constructing on turnkey conditions the following complete compressor stations: "Gubkinskaya" (Russia), "Tarutino" (Ukraine), "Bursa" and "Eskisehir" (Turkey), "Severnaya", "Astara" (Azerbaijan), "Serdar", "Barsa-Gelmez", "Goturdepe", "Yylanly", "Zapadnyy Shatlyk", "Deryalyk", "Goturdepe-2", "Naiyp", "Khazar" (Turkmenistan), "Hajiabad", "Abshirin" and "Sirjan" (Iran) and complete gas conditioning plants for Gubkinskoye, Severokomsomolskoye and Tarasovskoye fields of JSC "Rosneft".

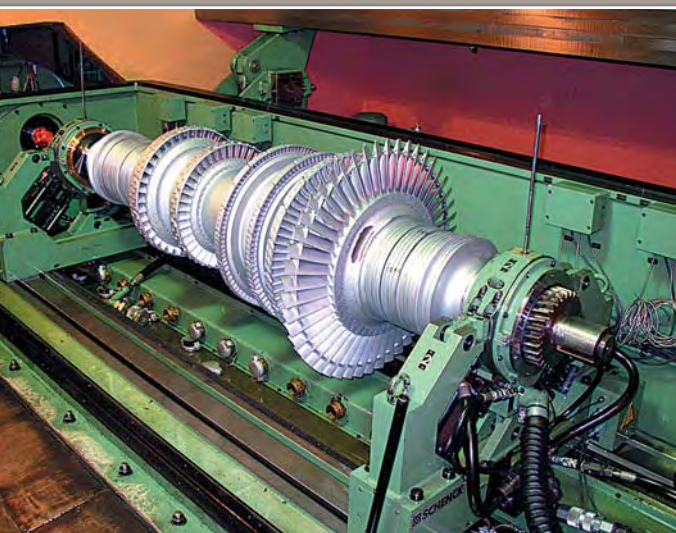
Considerable practical experience in manufacturing of a wide range of tailor made components that perfectly fit main equipment reduces the company's dependency on many sub-suppliers that considerably reduce time of delivery, site installation and commissioning of facilities.



**The SUMY Frunze machine-builders have gained great experience in manufacturing of complete process lines of equipment and ready for turnkey delivery and commissioning of great variety of integrated industrial facilities:**

- Gas compressor stations;
- Gas treatment plants;
- Oil (gas condensate) primary processing plants;
- CNG Vehicle Refueling Compressor Stations;
- Oil terminals on reservoirs basis with storage capacity of 1000 m<sup>3</sup> – 50,000 m<sup>3</sup>;
- Distilleries with daily output capacity of 100 dal/day – 6,000 dal/day, etc.





The company has launched the test bench for air testing of centrifugal compressors with power of 16 MW and trial stand for testing of low consuming oil mechanical seals.

All testing facilities are equipped with advanced SCADA systems.

Development of new state-of-the-art equipment requires experimental testing of pilot units and machines by employing modern testing approaches, measuring and computer equipment. JSC Sumy Frunze NPO has always paid special attention to the development of its testing capacities. To this end, a unique testing facility for full load string testing of compressor equipment has been built being the only one in Europe.

**Air Testing of Compressors.** Two full-size beds for shop-testing centrifugal compressors with 1 MW – 25 MW nominal capacity. The stands completely comply with API-617 and ASME PTC-10 international standards.

**Close Loop natural gas testing of centrifugal compressors** allows for testing centrifugal compressors within operating parameters of natural gas with measurements of capacity, power, efficiency, rotor axial thrust, vibration level, leakages through dry seals .

**Full load string testing of Turbo-compressor packages.** Each of three available closed loops allows for testing pilot models of turbo-compressor packages with ISO power rating of prime movers up to 25 MW.

**Test bench for model testing of elements of centrifugal compressors high-efficiency compression stages.** Stage testing is carried out on the aerodynamic bench with power of 400 kW at the rotational speed of 8000 – 8500 rpm. Maximum rotational speed is 16400 rpm at multiplier gear ratio of 5.47.

**Methane Reliquefaction testing bench** is designed for simulation of methane vapors reliquefaction technology during transportation of liquefied gas by tankers. Manufactured by order of Moss Maritime, Norway.

**Rotor balancing testing machine for centrifugal compressors** on operating rotational speeds. Manufactured by Schenck. The stand has contributed to enhancing the vibration durability of compressors.

**Testing bench for reciprocal compressors and compressor-refrigerator equipment** is designed for testing and adjustment of pilot designs of working cylinder valves, oil-free piston and stock seals, and oil catchers, durability tests, research and improvement of operation process.

**Testing bench for CNG Vehicle Gas Refueling and LPG Vehicle Gas Refueling Compressor Stations.**

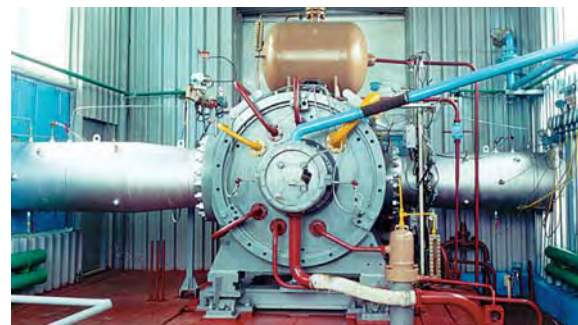
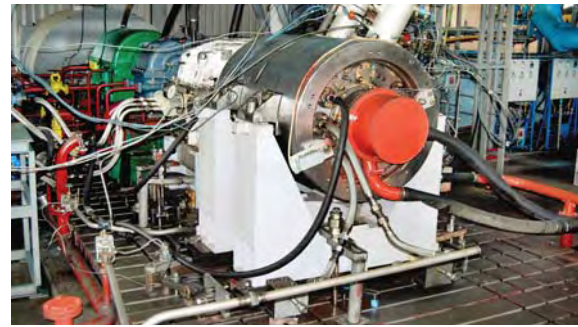
**Air Gas Coolers Fans Testing Bench.**

**In 2003, the Research and Development Facility for model testing.**

At present the following test benches are in service:

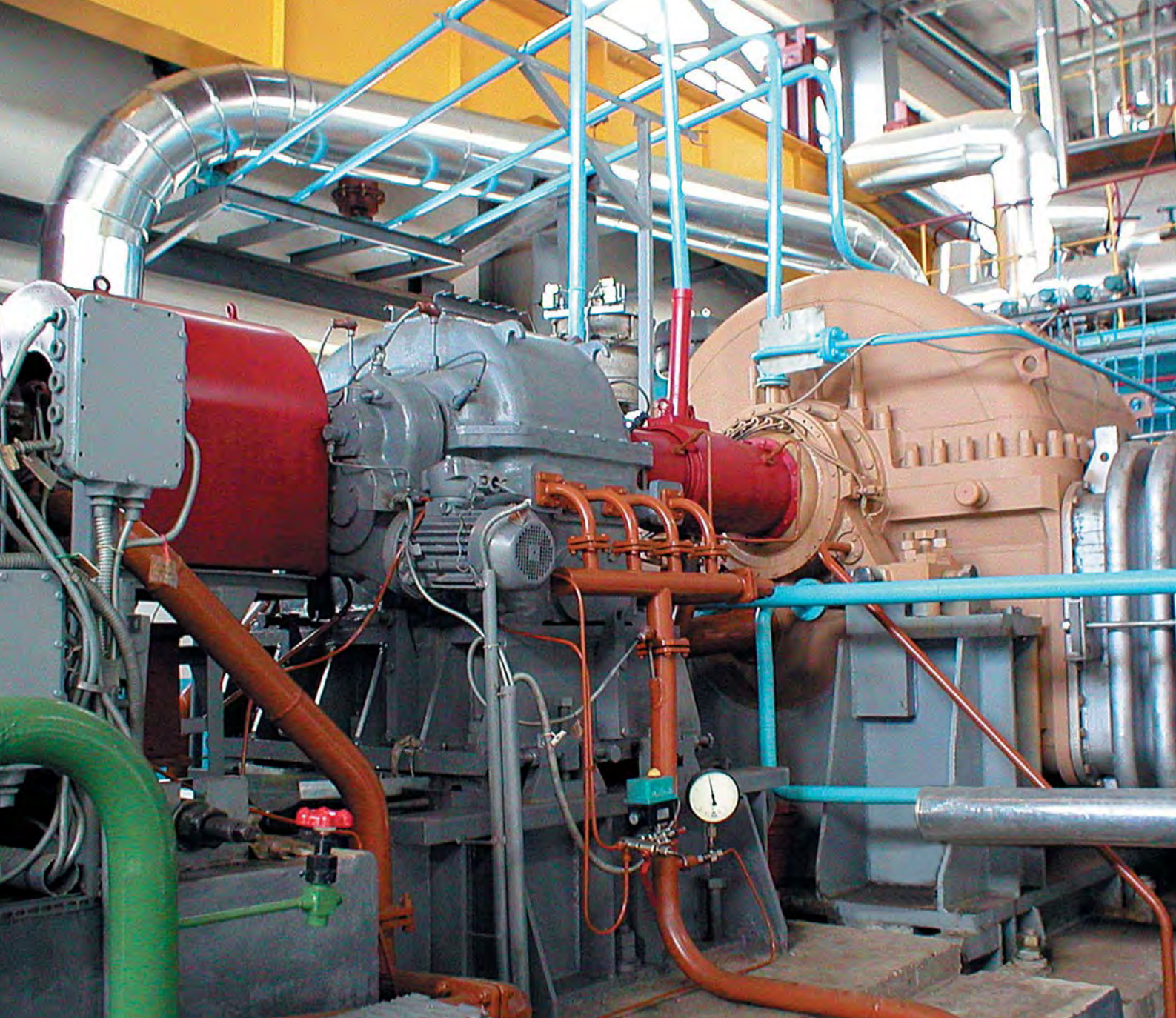
- Aerodynamical test bench for model stages testing of centrifugal compressors;
- Test bench for static purging;
- Test bench for dry gas seals;
- Test bench for piston compressors components;
- Test bench for drag compressors;
- Test bench for "gas-gas" pressure differential regulator;
- Test bench for parametric and climatic testing of control valves;
- Test bench for vibration testing of centrifugal compressors impellers.

The company has facilities for testing pumps of primary and secondary coolant circuits for nuclear power stations, centrifuges, pressure vessels, heat exchangers, columns and towers for petrochemical industries, hydraulic trial stands, including those for ultrahigh pressure.



Availability of great variety of research and testing facilities enables to maintain the high quality level of products, to create solid advanced basis for research and development, to exclude long term final development of new products and significantly reduce overall research, development and manufacturing phases of new products and technologies





The company's development business plan always contains a wide complex of activities for development of new products and modernization of serial products



10 Manufacturing of New Types Products

The scientific potential and production capacities of JSC Sumy Frunze NPO, its fruitful cooperation with research & development and engineering institutions enable it to develop and manufacture new equipment in extremely short time.

The following new products have been recently developed and manufactured:

**CO<sub>2</sub> Separation Plants for gas utilization** at solid waste dumps are designed for collecting gas generated at waste dumps. The gas contains 40%-60% of methane and after compression is used as fuel for gas power station. Such equipment has been shipped to Texas, USA.

**Gas turbine driven power plants** with output of 16 MW and 20 MW are designed for generating electric and heat energy with use of gas turbines as prime movers. They substantially increase the efficiency of organic fuels in electric power generation.

**Special pump equipment for Nuclear Power Plants**, namely the Tan'wan NPP, China; The Bushehr NPP, Iran; The Kudankulam NPP, India, Novovoronezh NPP, Smolensk NPP, Rostov NPP, Leningrad NPP, Kalinin NPP, Russia, Rovno NPP, Zaporozhye NPP, YuzhnoUkrainsk NPP, Ukraine, a modernized blade wheel for the GCN-195M pump with higher efficiency.

**Equipment for Interim Spent Fuel Facility** for storing solid radioactive waste of the Chernobyl NPP.

**Fuel gas compression and treatment plant on the reciprocating opposite high-speed compressor basis (UKPTG)** driven by a 500 kW gas engine. The unit provides required parameters of fuel gas under the conditions of formation pressure loss.

**Single-compressor and double-compressor vehicle gas refueling compressor stations** capable of 125–700 vehicle refueling daily.

**Starting system facilities** for "Soyuz-ST" rockets launching at Kuru space-launch complex (French Guiana) to provide rocket mounting and holding, reliable operation during preflight preparation and at starting moment of rocket erection.

**Adjustable-blade and radial-flow turbines** for hydraulic power stations.

**Equipment for industrial wind-driven power plants** with power from 600 kW.



Development of new product types is realized due to the fruitful cooperation of the company with design and scientific research institutes.

## Compressor Stations and Turbo-Compressor Packages

For over 30 years the JSC Sumy Frunze NPO has been one of the world's recognized leaders in design and manufacturing of block-container compressor stations for application in gas, oil and oil-refining industries designed for:

- transportation of natural gas, recovery and transportation of casing head gas;
- compression of oil gases in gas-injection extraction of oil;
- compression of casing head gas in gas refineries;
- pumping of gas into layers of gas condensate deposits by cycling process.

The stations are based on gas turbine driven centrifugal compressor packages or reciprocating compressor packages. Our designers have developed more than 100 models of gas compressors driven by industrialized versions of aeroderivative or marine gas turbines with the power capacity of 4 MW, 6.3 MW, 8 MW, 10 MW, 16 MW, 25 MW and driven by electric motors of the capacity ranging between 1.2 and 6.3 MW. More than 2,300 such units operate successfully in Ukraine, Russia, Turkmenistan, Uzbekistan, Azerbaijan, Iran, Argentina, Turkey and other countries in diverse climatic conditions - from the arctic cold to the scorching desert sands of the Kara Kum Desert.

The main advantages of the units are:

- high efficiency and reliability;
- compliance with modern environmental requirements;
- operability in any climatic zones in the  $-60^{\circ}\text{C}$  –  $+50^{\circ}\text{C}$  temperature range;
- complete factory readiness prior to delivery;
- full automation of packages;
- high field maintainability and repairability of units and assemblies.

**The company supplies the following process equipment for gas compressor stations:**

**Scrubbers** are designed for cleaning of natural gas from solid particles and liquid drops, which erode process equipment and pipes of compressor stations.

**Filter-separators** – for increase solid and liquid removal efficiency from natural gas. The company has developed and serially manufacturers of **filter-separators** with designed capacity from 5 MMSCMD – 25 MMSCMD.

**Gas Reducing Stations** are designed for treatment of natural gas compressed by gas compressor stations of main pipelines to be used as:

- fuel gas for operation of gas turbines of turbo-compressor packages;
- start gas for gas turbines;
- power gas to control pneumatically operated valves installed at gas compressor stations;
- fuel for utility services.

**Inlet separators** – for cleaning of associated oil gases from solid particles and liquid drops, for prevention of liquid bursts into process area of compressor stations. The company has designed and arranged serial production of inlet separator units with capacity of 100 m<sup>3</sup> and more.





The high degree of shop readiness expedites commissioning of gas compressor stations



**Intermediate separators** – for cleaning of process gas from solid and liquid particles in the process of associated oil gas compression.

**Air Gas Coolers** – for cooling of natural and associated oil gas at compressor stations of various applications, as well as for cooling gases and liquids in gas, chemical and petrochemical industries. The coolers are equipped with fans of own make with impeller diameters 400 mm, 800 mm, 2,800 mm and 4,450 mm.



Stations are supplied with complete sets of auxiliary and accessory equipment and systems of:

- heat supply;
- flare;
- induced ventilation of units;
- power air;
- lube-oil;
- inert gas supply,
- valves.

The entire complex of process and auxiliary equipment is controlled by modern microprocessor systems developed by the company based on the best hardware available at the market.

The company also manufactures spare rotor bundles for revamping of existing operating turbo-compressor packages:

- at booster compressor stations in order to ensure stable extraction of natural gas when layer pressure drops at final stages of gas field development;
- at linear compressor stations of main pipelines in order to optimize their operation;
- at underground gas storage facilities for optimal use of equipment at variable gas injection/taking modes. These rotor bundles consist of rotor and stator parts of the compressor and installed instead of existing inside operating turbo-compressors.





# Equipment for Gas and Oil Industries

The company produces a wide range of products for application in oil and gas industries.

For development and repair of oil and gas wells, the company produces **KORO 1-80 and AK-60 mobile well work-over rigs** - sophisticated drilling and repair systems mounted on the chassis of heavy-duty MAZ and KrAZ trucks.

For drilling operations during extraction of oil and natural gas and prospecting new fields in any climatic zones, the company produces **drill collars and kellies**. These products are manufactured at the pipe-rolling plant built by the Italian company Danieli. The plant is a modern highly mechanized and automated enterprise with a complete process cycle. It has the following sections:

- **steel casting**, for obtaining high-tensile alloyed steel foundry; equipped with two powerful electric smelting furnaces and a continuous casting plant;
- **forge and heat-treating**, for handling rod blanks; equipped with a radial forging machine;
- **mechanical treatment**, for surface treatment and deep drilling (up to 16 m) of pipes.

The product nomenclature includes six types of drill collars and two types of kellies. In order to expand supplies, the enterprise took a series of measures for certification and has received the "Specification 7" certificate of the American Petroleum Institute.

Complex development of natural gas, gas condensate and oil fields involves certain treatment operations on natural and casing head oil gas as well as utilization of carbohydrate condensate. For decades, only 40% of oil gas has been processed, the rest being flared, thus inflicting tremendous economic and environmental losses. As a solution, the JSC Sumy Frunze NPO manufactures, on a turnkey basis, installations of various capacity for **complex treatment of natural gas** and for **processing of oil (condensate)**.

**Complex gas treatment plants** are designed:

- for treatment of high-pressure natural gas by way of low-temperature separation with methanol injection and reaching the water and carbohydrate dew point as specified by relevant standards, prior to distribution through main pipelines;
- for obtaining stable carbohydrate condensate as specified by the OST 51.65-80 national standard.

**Gas treatment plants** are designed for extracting a wide fraction of light hydrocarbon from casing-head gas. They perform the following operations:

- treatment of natural gas, including cleaning and drying;
- gas stripping, i.e. extraction of raw natural gasoline;
- reception, storage, and shipment of liquid products by rail, road or pipelines.



**Installations for oil (condensate) processing** are designed for processing of petroleum (condensate) with the annual crude oil processing capacity of 10,000 t; 25,000 t; 40,000 t; 50,000 t; 100,000 t; 150,000 t; 200,000 t; 300,000 t; 500,000 t and obtaining straight-run gasoline, diesel fuel and residual fuel oil.

The company has launched serial production of process equipment for refueling the vehicles with compressed natural gas used as motor fuel. It is the parameters series of **CNG vehicle refueling gas compressor stations** with daily capacity from 40 to 700 refuelings which are fed from municipal gas mains under the pressure of 0.05...1.7 MPa. The stations are produced as ready-for-use container modules.

The company offers manufacture and EPC commissioning of **oil terminals** for storage of oil and petroleum products. In the manufacture of reservoirs the company uses a self-designed and self-made plant for rolling of metal sheets.





**The JSC Sumy Frunze NPO is one of the leading manufacturers of pipeline valves for oil and gas industries in the CIS.**

The company serially manufactures more than 150 size types of pipeline valves:

- manual and gear operated ball valves for surface and underground installation. The diameter of ball valves with pressure PN 100 varies from 300 mm up to 1400 mm;
- check valves DN 300, 400, 500, 700, 1000, PN 100;
- convex strainers DN 700, 1000, PN 100.

A considerable part in the total production output belongs to valves for turbo-compressors and CNG gas refueling compressor stations and for other process equipment:

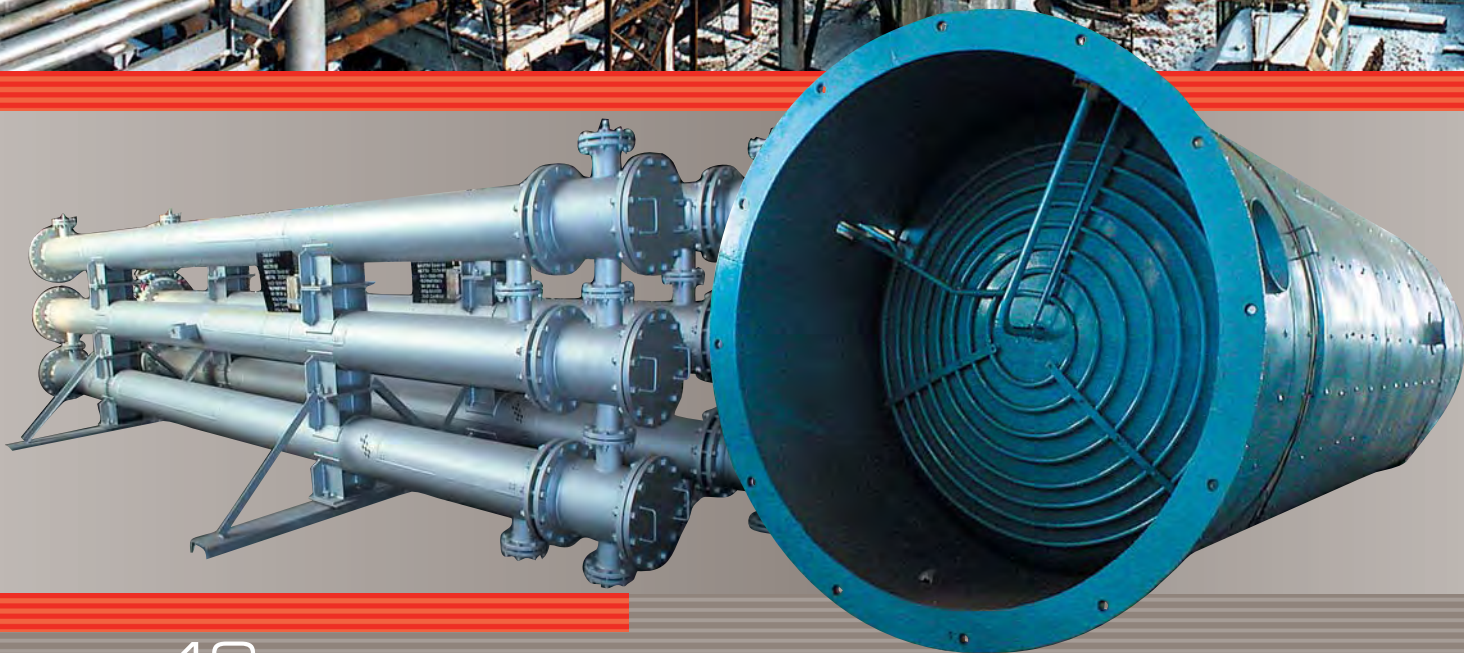
- ball valves from DN 6 to DN 200 for different pressures;
- check valves from DN 50 to DN 200 for different pressures;
- shut-off and gate valves.

Continuous research and development of new designs with the use of advanced computer software programs, high technical level of manufacturing, which includes simulation tests, enable us to produce high quality and competitive products with improved technical and operational characteristics.

The valves manufactured by the company are based on high technology stamped and welded design, split and full body, flanged and welded ends, with wear-resistant elastomer seals which provide the reliable valve tightness and are distinguished by high quality, ease and convenience for service.

These products are supplied to Russia, Uzbekistan, Turkmenistan, Poland, Bulgaria, Iran, Turkey, the USA and other countries. Each type of the pipeline valves has been certified in accordance with domestic standards and API-6D.





The JSC Sumy Frunze NPO is one of the leading chemical machine-building enterprises. We are proud to say that our equipment operates at practically all chemical factories in the CIS.

During 110 years of its history the company has gained great experience in design and manufacturing of both separate items for chemical production lines and complete process lines.

**The company produces:**

**Towers** with working pressure up to 25 MPa (250 kgs/m<sup>2</sup>), temperature from -210°C to +700°C and volume from 0.3 m<sup>3</sup> to 1000 m<sup>3</sup>:

- plate;
- packed;
- packaged for rectification, absorption, desorption, extraction, etc.

**Heat exchangers** with working pressure up to 25 MPa (250 kgs/m<sup>2</sup>), temperature from -210°C to +700°C and volume from 0.3 m<sup>3</sup> to 600 m<sup>3</sup>:

- "N" type with fixed tube plates;
- "P" type with a floating head;
- "K" type with an expansion bend on a shell;
- "U" type with U-tubes;
- "PK" type with a floating head and a compensator on it;
- exchangers with twisted tubes;
- spiral exchangers;
- special exchangers;
- evaporators.

**Pressure vessels** with working pressure up to 25 MPa (250 kgs/m<sup>2</sup>), temperature from -210°C to +700°C and volume from 0.3 m<sup>3</sup> to 1000 m<sup>3</sup>:

- with internals;
- with mixing devices;
- special vessels, including pot stills, oxidants, washers, reactors, regenerators, mixers, separators, chlorinators, extractors.

**Vacuum filters.**

**Centrifugal atomizers.**

**Centrifugal separators.**

**Crystallizers.**

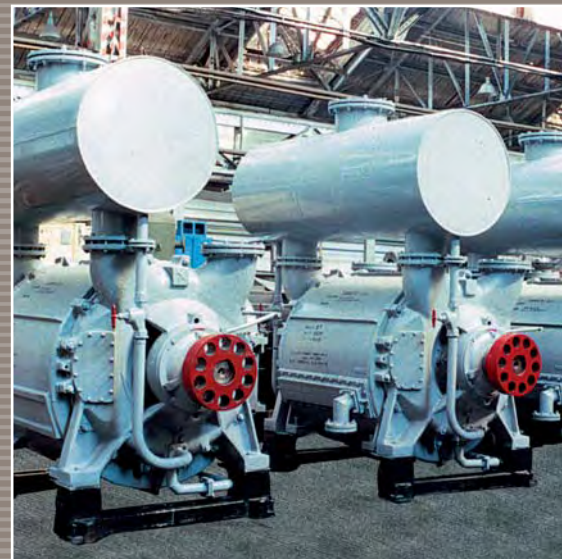
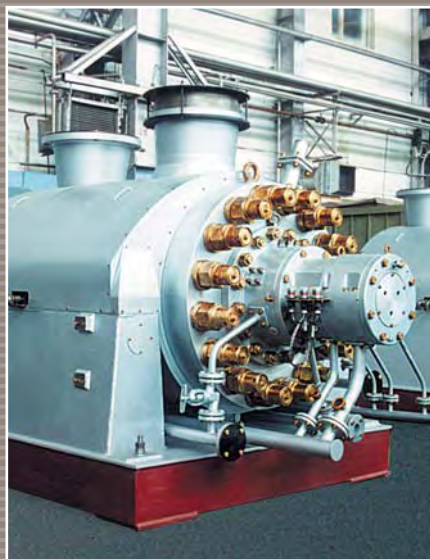
The company manufactures and supplies sets of process equipment for various chemical productions of:

- weak nitric acid;
- soda ash;
- helium concentrate;
- ethylene and propylene;
- distillate (100 dal – 6,000 dal per day);
- ammonium nitrate;
- sulfuric acid;
- titanium dioxide, etc.





Operating nuclear power plants in Ukraine, Russia, Armenia, Lithuania, Bulgaria, Finland, the Czech Republic, Slovakia, Hungary and China operate with pumping equipment made by our company



The JSC Sumy Frunze NPO manufactures a wide range of pumping equipment. Its liquid-packed ring vacuum pumps, compressors and rotary pumps are designed for different industries. They are made of carbon and stainless steels and titanium alloys. The pumps are highly reliable and easy to operate.

In terms of nominal output capacity, **liquid-packed ring-type vacuum pumps** range from 12 m<sup>3</sup>/min to 340 m<sup>3</sup>/min. The nominal output capacity of **liquid-packed ring compressors** varies between 25 m<sup>3</sup>/min and 150 m<sup>3</sup>/min.

The centrifugal high pressure multistage pump units of CNS type with flow rate of 120, 180, 240 m<sup>3</sup>/h and head from 1,050 m to 1,900 m are designed to intensify oil extraction in **oil industry**. The pumps are effectively protected and can be used for pumping of industrial, sewage and stratal waters with a high content of abrasive admixtures, including those containing hydrogen sulphide. The company offers a wide range of pumps with flow rate of 63 m<sup>3</sup>/h – 240 m<sup>3</sup>/h and head ranging between 1,050 m and 2,100 m.

**For effective development of oil deposits** the company has developed the multistage pump 2VV 500-30, which provides for simultaneous pumping of petroleum, natural gas and liquid through the same pipeline system. For pumping petroleum products (lube, black oil, diesel fuel, crude oil) the company offers three-screw pumps 3V8/100 and 3V16/25 with the output capacity between 12 m<sup>3</sup>/h and 22 m<sup>3</sup>/h.

**For the chemical, oil, and gas industries** the company manufactures a wide assortment of centrifugal pumps with the output capacity from 2 m<sup>3</sup>/h to 500 m<sup>3</sup>/h. Made of corrosion-resistant and titanium alloys, they are operable in highly corrosive media.

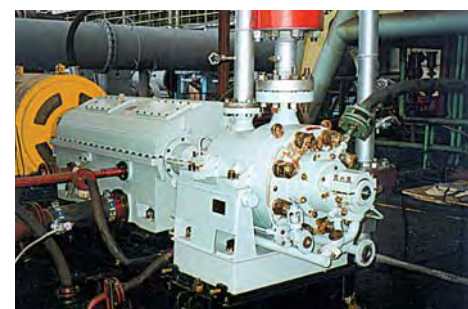
**For the metallurgical and cement enterprises** the company manufactures CPN-type 225 m<sup>3</sup>/h – 800 m<sup>3</sup>/h mud pumps. NCS-type pumps are designed for water draining of mines in mining industry. We have designed 21 standard models with their output capacity ranging between 80 m<sup>3</sup>/h and 500 m<sup>3</sup>/h and heads reaching 1,000 m. They meet all modern requirements and have gained high reputation for their long service life and high reliability.

The company is the main supplier of special pumping equipment for all generating units of **nuclear power plants**. The pumps are manufactured in specialized shops in full conformity with the safety norms and regulations of the State Committee for Nuclear Energy Control under the Environment Ministry and are subjected to strict quality control. The company has advanced testing facilities. The products have total service life of at least 30 years.

Unique equipment manufactured includes **reactor coolant pumps GCN-195M** with coolant delivery of 20000 m<sup>3</sup>/h for NPP with power units VVER-1000.

The company manufactures a wide range of pump equipment for NPP, including for important safety-related systems (feed water pumps, first and second stage condensate pumps, charging pumps of primary circuit system and boric acid control, emergency feed water pumps, fire-fighting system pumps, etc). Moreover, the company developed and implement manufacture of large-sized centrifugal and axial pumps for cooling technical water supply.

Total amount of standard sizes of pump equipment for NPP manufactured at the company is more than 90 items.





# Compressors

The JSC Sumy Frunze NPO is one of the oldest manufacturers of opposite reciprocating compressors and the only manufacturer of heavy-duty compressor equipment in CIS countries. The reciprocating compressors of medium, high and superhigh pressure are used for production of mineral fertilizers, for air separation, production of polyethylene under high pressure, compression of natural and associated oil gas, nitrogen, hydrogen and gas mixtures in energy, petrochemical, oil-refining and metallurgical industries.

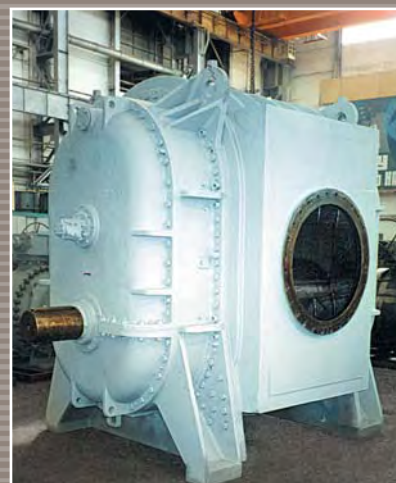
The company manufactures range of **special compressor units for CNG Vehicle Refueling compressor stations** and **unit plants** with power of up to 600 kW, including engine gas drive.

The company produces **mobile compressor units**, designed for feeding special equipment with compressed to 400 atm. air. The units are fully autonomous and can be shipped by road and rail vehicles, air and waterways. They are highly reliable, durable, easy to operate and maintain, which makes them indispensable for field operation.

All compressors are equipped with a **system of automatic control and protection**, which ensures control of basic operating parameters, emergency warning and alarms and shutdown of prime movers.



We are the only national manufacturer of heavy-duty compressors



# Centrifuges

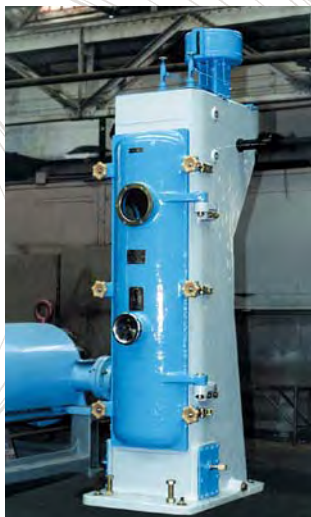
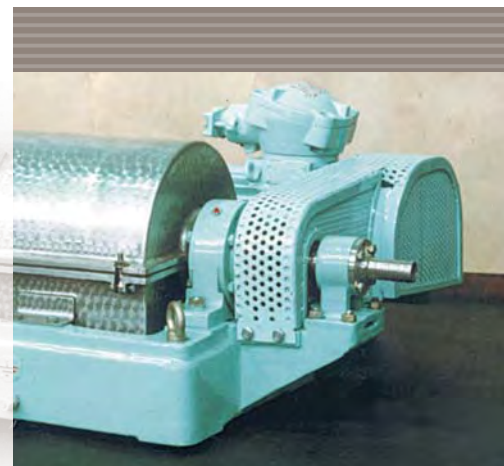
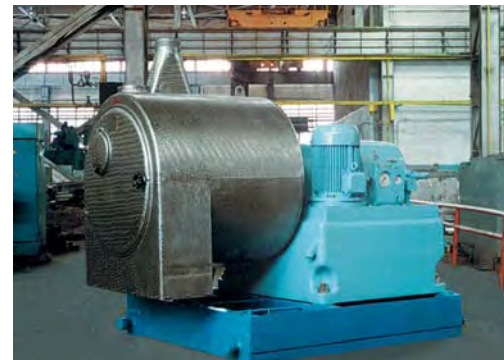
**Centrifuges are one of the main products by the JSC Sumy Frunze NPO since 1902.**

The Centrifuges are designed for the chemical, oil-processing, food, biological, pharmaceutical and sugar industries, sewage treatment plants, etc.

Depending on specific applications, centrifuges are made of carbon and stainless steels or titanium alloys. The company presently manufactures various types of modern centrifuges:

- **horizontal scroll discharge** sedimentation and filtration OGSh and FGSh centrifuges with the bowl diameter ranging between 200 mm and 1,000 mm;
- RGSh **centrifuges for separation** of three-component mixtures;
- **FGP multistage filtering reciprocating pusher sediment discharge centrifuges** with the bowl diameter ranging between 400 mm and 1,200 mm;
- FGN and OGN **automatic filtering** blade sediment removal centrifuges with the bowl diameter ranging between 630 mm and 2,200 mm;
- SRC **separators for cleaning of oils** with the bowl diameter 320 mm;
- **Cleaning and separating centrifuges** with the bowl diameters 100 mm and 150 mm for the microbiological and medical industries;
- FPN and FPI **vertical suspended** computer-controlled centrifuges for the sugar industry with a loading capacity of 1 t and 1.5 t fillmass per cycle equipped with PLC by Schneider Electric and a Siemens AG energy-saving electric drive.

Based on OGSh-type centrifuges, special **clay separating systems** have been developed for cleansing drilling mud in gas and oil wells.



# Certification

Today the Company offers certified products. Our Company was one of the first companies in the CIS to obtain certificates of international standards.

The company has received and operates with the following certificates:

- ISO 9001-2008 quality management certificate, issued by Bureau Veritas Quality International;
- American Society of Mechanic Engineers certificate, entitling the company's products to the "U" (under pressure) and "PP" (pressurized pipeline) stamps.

**American Petroleum Institute certificates:**

- type approval certificates for 6.3 MW and 16 MW centrifugal compressors according to API 617/614 standards;
- approval certificate for manufacture of shutoff valves according to API 6D standard;
- type approval certificates for ball and check valves as conforming to the API 661 standard.

**Certificates issued by GOST R (Russia):**

- OGSh, FGN, FPI, OTR, FPN centrifuges;
- CNS pumps and units based on them;
- RVN, VVN vacuum pumps;
- VK liquid-packed ring machines;
- GPA-C-6.3V, GPA-C-16S turbo-compressors;
- CNG vehicle refueling compressor stations;
- AK-60, KORO 1-80 well work-over rigs;
- shutoff valves (ball valves, check valves);
- reservoirs, heat exchangers, complete blocks of equipment for oil, gas, chemical industries.

**Permit of GOSPROMNADZOR (Belarus) for manufacturing and application of the equipment for gas main pipelines and petrochemical industry within the Republic of Belarus.**

**Certificates issued by UkrSEPRO (Ukraine).**

**Environment protection management system and industrial safety certificate.**



The products of the JSC Sumy Frunze NPO are in conformance with national, Russian and international standards



The JSC Sumy Frunze NPO has close partnership ties with customers in more than 40 countries worldwide: traditional CIS customers in Russia, Turkmenistan, Uzbekistan, Kazakhstan, Belarus and those in the USA, Norway, China, Turkey, Iran, India, Germany and many others.

The company has gained worldwide reputation as manufacturer of gas compressor stations and packages, centrifuges, piston compressors, equipment for chemical and petrochemical industries.

Export is the major part of the company's production program, with the assortment, volumes and geography of supplies constantly expanding.

The company offers foreign customers all kinds of its products, being confident about its high quality. Full compliance with contractual commitments is guaranteed.

To ensure better co-ordination with traditional partners, the company has registered its offices in Russia, Turkmenistan, Azerbaijan and Bulgaria. JSC Sumy Frunze NPO has plenipotentiaries in more than 15 countries all over the world such as Germany, the USA, India, Turkey, Iran, Kazakhstan etc.

## The JSC Sumy Frunze NPO is ready for fruitful cooperation



### WE OFFER:

- services in design, manufacturing, installation, pre-commissioning and commissioning of equipment and complete process lines for oil, gas, chemical, aluminium and other industries;
- services in casting, forging and balancing as well as repairs and overhauls of machines and mechanisms.





**JSC "SUMY FRUNZE  
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SCIENCE AND PRODUCTION  
ASSOCIATION"**

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