"GKMP"

Research & Productio
Company" LLC"

GKMP
RESEARCH & PRODUCTION
COMPANY

TURNING IDEAS

INTO REALITY

GKMP
RESEARCH & PRODUCTION COMPANY

About company

Full range of services

A global team of more than 600 employees

More than 80 engineering experts

63 000 m² of production facilities

Over 250 modern machine tools and other processing equipment

ISO 9001 QUALITY ASSURANCE

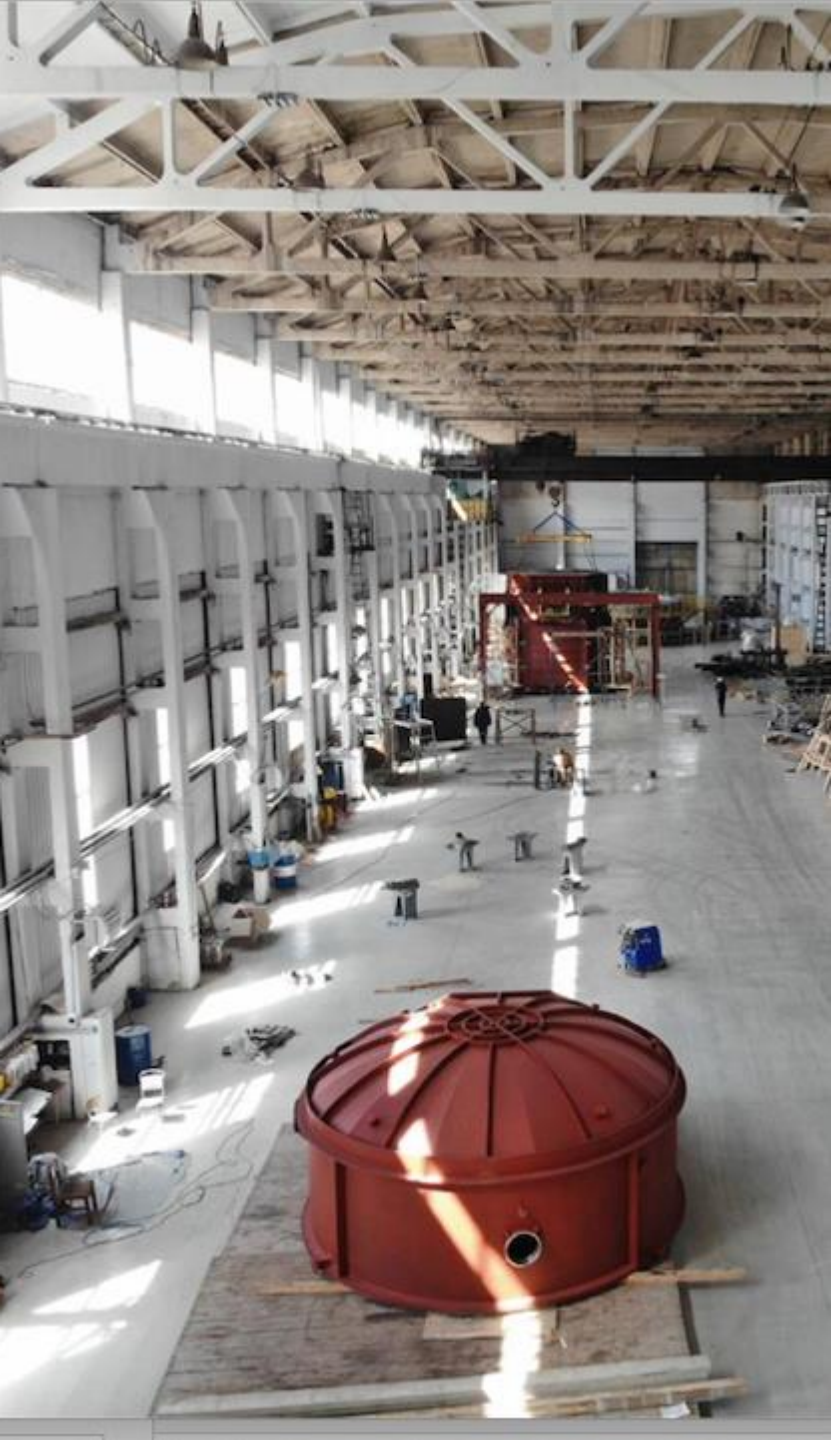
Quality management system ISO 9001

About company

NPO GKMP LLC (Limited liability company "the Scientific production association "Machinery and Tools Engineering Group") is a Russian developer and manufacturer of the special purpose industrial equipment.

- Vacuum chambers
- High temperature and vacuum electric furnaces
- Technological lines designed for thermal treatment, quenching, annealing, tempering of complex and large-scale products
- Vacuum coating machines
- Thermal diffusion machines
- Monocrystal growing machines
- Thermal vacuum chambers
- Vacuum shut-offs
- Products from refractory metals
- Metal bellows, incl. high-pressure ones

GKMP RESEARCH & PRODUCTION COMPANY



About company

NPO "GKMP" LLC Quality management system is certified in accordance with standards GOST and ISO 9001-2015 (ISO9001:2015) and GOST RV 0015-002-2012, as confirmed by the relevant certificates. NPO "GKMP" LLC successfully performs external audits yearly.

The company is subject to internal and external audits on regular basis.

Our customers:

- electronics industry companies,
- atomic and aerospace industry companies.

GKMP
RESEARCH & PRODUCTION COMPANY

About company

Company's State-of-art capacities:

- over 250 machines, more than a half purchased for the last 5-7 years,
- Vacuum laboratory,
- Destructive and non-destructive control laboratory,
- Leak detectors with sensitivity level up to -13,
- Spectrographic devices and molecular set-ups for chemical analysis,
- X-ray chamber equipped with a digital X-ray machine,
- Unique technological equipment for ultrasonic phased array control
- Devices designed to control vacuum surface roughness,
- Vacuum furnace for annealing and post-welding thermal treatment,
- Laser tracker Leica 960T.

GKMP
RESEARCH & PRODUCTION COMPANY

About company


ЛИЦЕНЗИЯ


ЛИЦЕНЗИЯ

Federal licenses for environmental, technological and nuclear supervision for the right to design and construct buildings, complexes, facilities using nuclear materials.


СВИДЕТЕЛЬСТВО


СЕРТИФИКАТ СООТВЕТСТВИЯ


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 149242
ПАРОГЕНЕРАТОРНЫЙ УВЛАЖНИТЕЛЬ ГАЗА


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 139689
ПОДЪЕМНИК ПОДА ТЕРМИЧЕСКОЙ ПЕЧИ


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 155040
БЛОК НАГРЕВА КОЛПАКОВОЙ ЭЛЕКТРИЧЕСКОЙ ПЕЧИ

GKMP
RESEARCH & PRODUCTION COMPANY


GKMP
RESEARCH & PRODUCTION
COMPANY
Vacuum and special
purpose equipment
and systems

Vacuum and special purpose equipment and systems

Thermal vacuum test chamber

The chamber STVI-2 is intended to measure optical and physical characteristics of the hardware while experimental on-ground testing of the on-board equipment in imitated space environment.

The vacuum chamber is 5000 mm in diameter and 10000 mm high.

Configuration:

- Vacuum chamber;
- Vacuum pumping system;
- Cryogenic space environment simulation system;
- Optical system for point-source feed simulation;
- Solar radiation simulation system;
- Heat flux simulation system;
- High-precision hexapod for object positioning

GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum and special purpose equipment and systems

Experimental thermonuclear toroidal reactor designed for hot plasma physics research, qualification of various reactor modules and triggering the thermonuclear fusion

Chamber configuration:

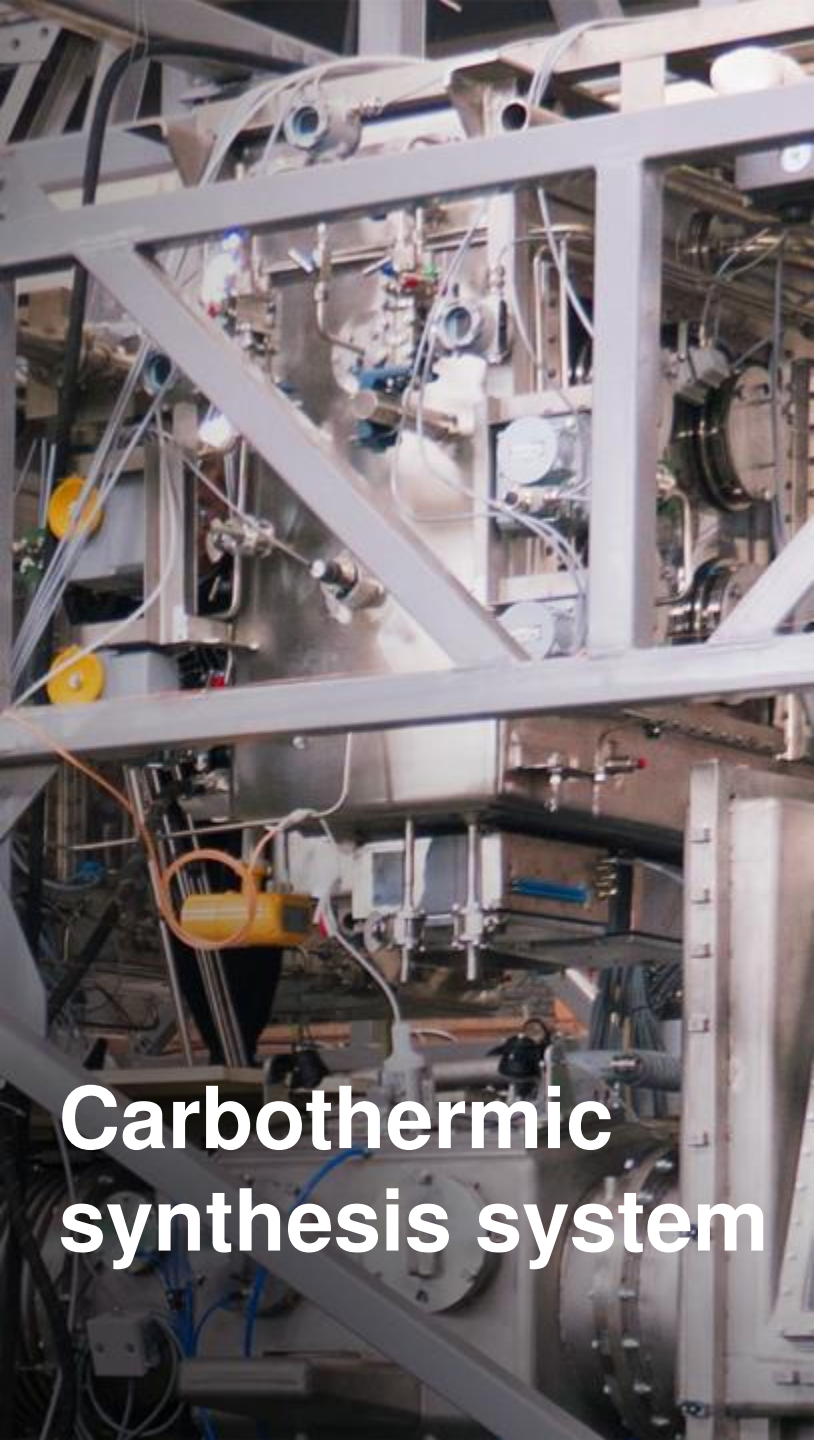
- Internal size of the chamber 3.39 m (vertically);
- Wall thickness 5...8 mm;
- Chamber volume 47 m3;
- Max. background pressure 10-5 Pa;
- Wall covering material - graphite FP479;
- Vacuum chamber material – stainless steel AISI 321.

Magnet system is designed to supply and maintain hot plasma in divertor configuration. Magnetic coils produced from rectangular sectioned argentic copper strand equipped with a through hole to supply cooling water; the copper wires are wrapped in specifically baked vacuum insulation and placed inside steel casing.

Pilot coils have the following dimensions :

- Internal diameter from 5050 mm to 6322 mm;
- External diameter from 5170 mm to 6640 m;
- Height from 210 mm to 277 mm;
- Mass from 4050 to 69 kg.

GKMP
RESEARCH & PRODUCTION COMPANY



Carbothermic synthesis system

Vacuum and special purpose equipment and systems

A fully automated facility comprising 8 gas and vacuum pushing furnaces designed to perform complex processes of concreting and deposition, connected within an automated unified transportation leak-tight line. The facility is capable to operate 24/7 all over the year, no presence of the staff is required.

Key benefits of technological lines:

- The possibility to implement a full technological processing cycle within a single closed loop facility;
- To minimize personnel interaction with processed products, almost completely eliminate influence of the human factor provided to the manufacturing process;
- Full complex automation of the production process;
- Highest reliability and processing accuracy;
- Energy saving and safety.

Application scope: any fully automated production, where a human intervention is optional or undesirable.

Technological lines comply with the international standard Industry 4.0.

GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum shaft-type furnace

Vacuum and special purpose equipment and systems

Vacuum shaft-type furnace 8 m in diameter and 4.5 m high is intended to anneal in vacuum large welded constructions and elements of vacuum chambers produced from austenitic or martensitic materials. The baking process enables to relieve the residual internal stresses.

While producing critical welded items, especially the vacuum chambers, the internal structure of a material is subject to stresses. Within few years it may result in destruction of the hardware; in case of vacuum chambers it can lead to leakage and complete inoperability.

Configuration of the hardware:

- Vacuum chamber body with a detachable cap and 10 heat-resistant steel panels mounted on it,
- Special high-temperature lining;
- Foot platform;
- Vacuum pumping system based on plunger-type Roots pump and booster oil vapor pump;
- Pneumatic system;
- Electric heaters equipped with nickel-chromium undulate resistors;
- Water cooling system;
- Control system;

The Chamber is subdivided into 12 thermal areas.

GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum and special purpose equipment and systems

The vacuum chamber with an internal diameter of 5200 mm and a height of up to 13100 mm VU-180 is designed to test products in simulated space environment. The camera is modular, enabling to change the required operating volume.

Configuration:

- Modular vacuum chamber;
- Internal technological table;
- Service lighting system;
- Vacuum pumping system;
- Cryogenic shrouds;
- LN2 supply system;
- Measurement system;
- Control system.

VU-180 is intended for thermal vacuum tests in space environment with a possibility to manage life of the subject under test.

GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum chamber PS-45

Vacuum and special purpose equipment and systems

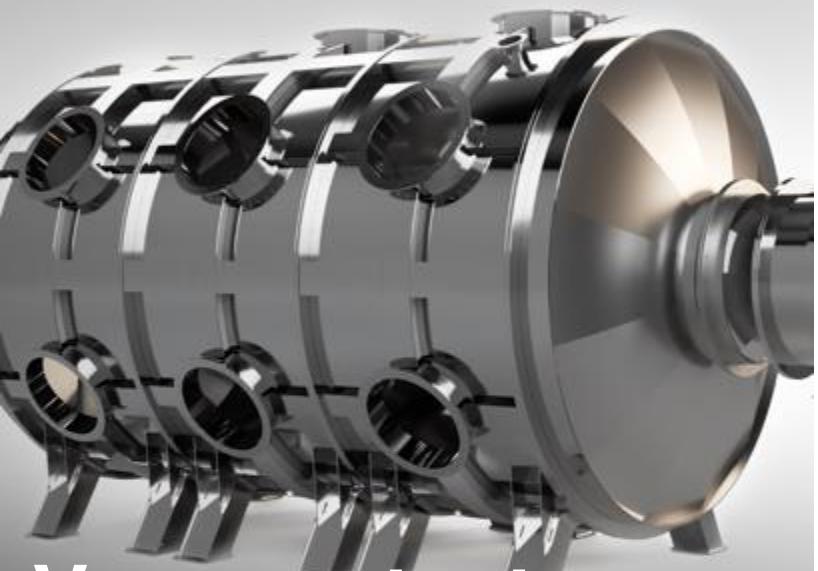
Additional section is intended to extend the existing vacuum chamber in order to test plasma thrusters. The section is made of stainless steel and has a set of rib stiffeners. The internal diameter is equal to 3800 mm, the length is 3870 mm.

The chamber is designed to perform firing tests of plasma and ion thrusters.
The chamber is equipped with 5 flanges DU1250 used to mount special cryogenic pumps upgraded for xenon pumping.

The operating vacuum level is over 10-6 ppm.

GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum and special purpose equipment and systems



Vacuum test chamber for high-power thrusters

The chamber is intended to perform firing tests of high-power stationary plasma thrusters developed and produced in LPSC, India.

In order to simulate on ground the conditions close to space environment, the large-scale vacuum chamber are produced enabling a rather high pumping speed, equipped with dissipation device and protected from plasma flux.
To facilitate the maintenance and use, the thruster under test is located in the pre-chamber that could be cut-off from the vacuum chamber.

Configuration:

- Main vacuum chamber;
- Pre-chamber for thruster location;
- Carbon lining;
- Cooling system;
- Plasma beam trap system;
- Vacuum pumping system based on screw-type vacuum pumps, turbomolecular pumps and special cryogenic vacuum pumps for xenon pumping;
- Plasma parameter measurement systems;
- Control system.

GKMP
RESEARCH & PRODUCTION COMPANY

Gas discharge chamber STIS-1C

Vacuum and special purpose equipment and systems

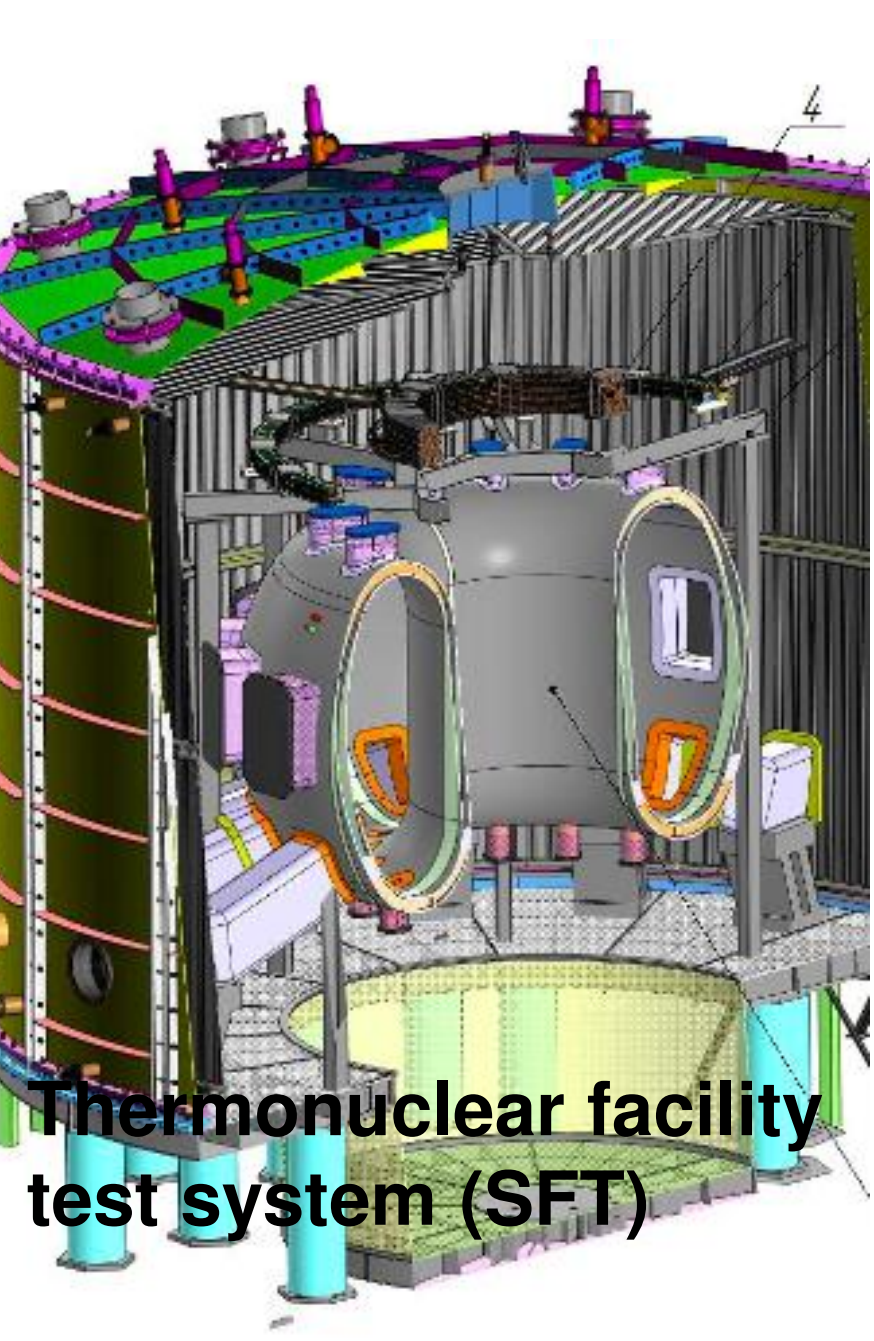
The chamber is designed to generate plasma flux and manage it via an embedded ion-optical system; it forms an integral part of the experimental particle accelerator.

Inside the gas discharge chambers plasma discharges of the required density are ignited. Then by using an ion-optical system, a cloud of charged particles is divided into ions and electrons that are further driven to the system.

Such chambers often form part of a technological spraying system or charged particle accelerators.

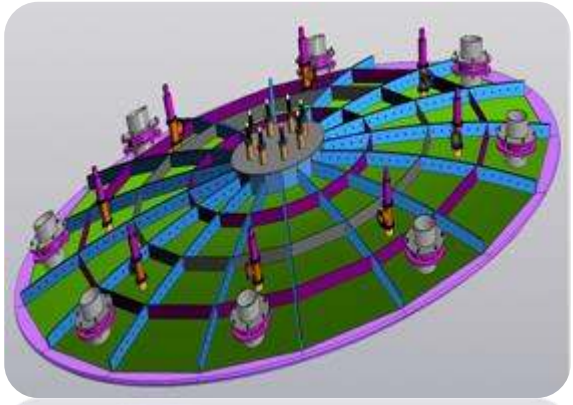
GKMP
RESEARCH & PRODUCTION COMPANY

Vacuum and special purpose equipment and systems



Thermonuclear facility test system (SFT)

Thermonuclear facility test system SFT is designed to test cryogenic system, pumping system and power supply system within the framework of the infrastructure in order to demonstrate efficiency and functional capacity of the thermonuclear facility SFT.

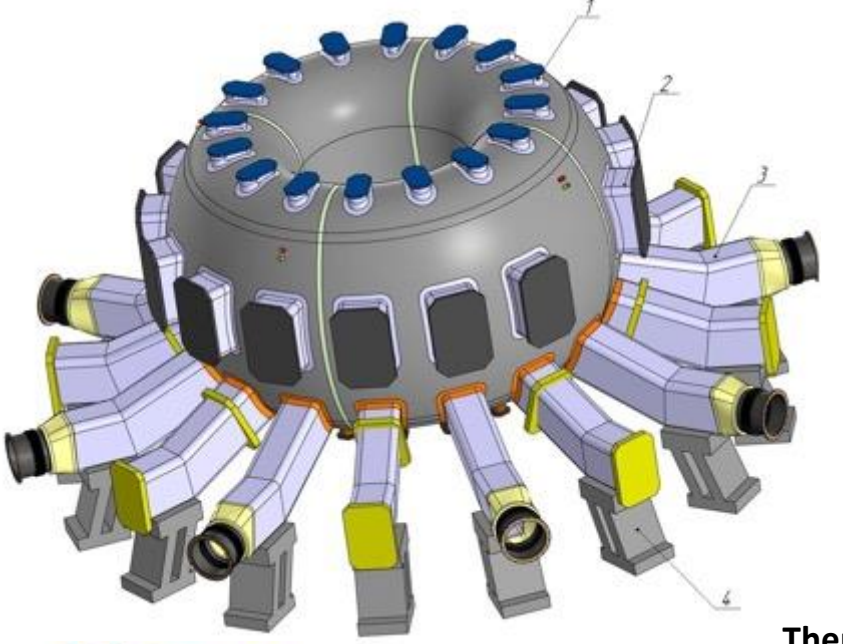


Configuration:

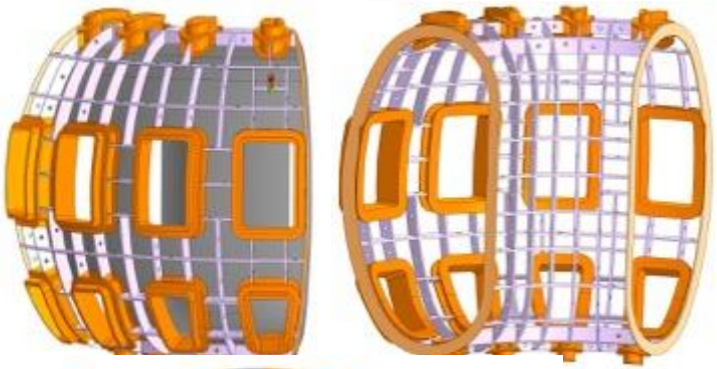
- Thermostatic cooler
- Vacuum chamber
- Winding OU1
- Winding OU2
- Coil support plate
- Coil feeder OU 1
- Coil feeder OU 2
- Coil feeder support ОУ
- Coil feeder support ОУ2

ГКМП
НАУЧНО-ПРОИЗВОДСТВЕННОЕ ОБЪЕДИНЕНИЕ

Vacuum and special purpose equipment and systems



The SFT test system also enables to test magnet systems and magnetic coils based on low and high temperature superconductors, as well as cryoresistive coils.

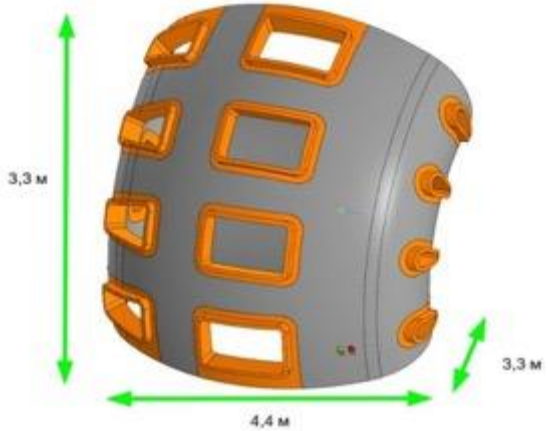


Thermostatic cooler parameters :

Hight	11.3 m
Diameter	12 m
Wall thickness	30 mm
Mass	235 t
Volume	990 m3
Number of base columns	16
Material	AISI 304L

Vacuum chamber parameters:

Hight	3.85 м
Int. Diameter	2.56 м
Ext. Diameter	6.64 м
Wall thickness	25 мм
Heating temperature	170 C
Mass	51 т
Volume	74 m3
Number of sections	4
Material	AISI 304L

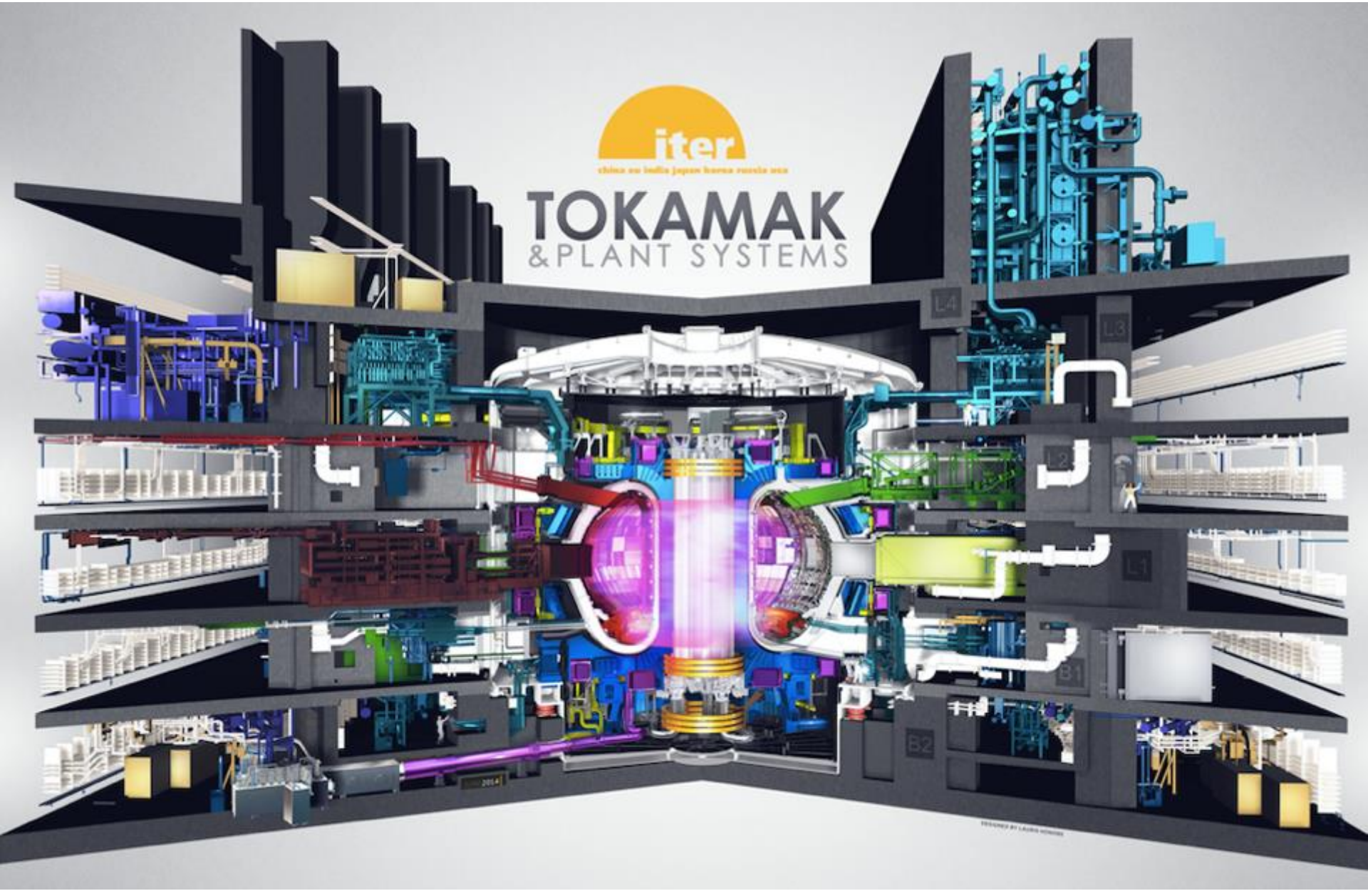


Section size and location while transportations

GKMP
RESEARCH & PRODUCTION COMPANY

GKMP
RESEARCH & PRODUCTION COMPANY

Port Plug Test Facility for ITER Project



Стенды испытаний порт плагов для Проекта ИТЭР

The European Union
Japan
Russia
USA
Korea
China
India

ИТЭР, Франция

Port Plug Test Facility for ITER Project

Project name: ITER PPTF Project is part of International Thermonuclear Experimental Reactor located in Cadarache, France.

- Construction Completion (phase 2) – 2035 year
- First Plasma (phase 1) – 2025 year

https://www.iter.org

General Contractor and End User: ITER Organization, Building 81/253B, Route de Vinon-sur-Verdon - CS 90 046 - 13067 St Paul Lez Durance Cedex - France

Site: ITER construction site, Cadarache, France.

Customer for Russian Suppliers: Russian Domestic Energy, «Rosatom», 123182, Moscow, Kurchatov square, 1/3
http://iterrf.ru

GKMP
RESEARCH & PRODUCTION COMPANY

Port Plug Test Facility for ITER Project

Test Facility for Equatorial and Upper Port Plugs with PP Handling system is intended for functional and climate tests of the Port Plugs before their direct work in ITER Tokamak.

Project Scope for 4 PPTFs units:

- Vacuum chamber with adapter [vacuum 10-6 Pa, T + 240C, dia 3,4m, length 6 m]: **4 nos**
- Vacuum system: **4 nos**
- Heating and cooling system: **4 nos**
- Port Plug Handling System: **3 nos** (2 configurations in each)
- Port Plug Imitators/Dummy PLus: **2 nos**
- Pressure Suppression System: **1 nos**
- Protection Screens: **2 nos** (2 configurations)
- Control and Instruments System: **4 nos**
- Auxiliary equipment for Integrated Factory Acceptance Test and Site Acceptance Tests: **4 nos**

Project Stages:

- 2012-2019: Conceptual Preliminary and Final Design Review
- 2020-2022: Manufacturing readiness review
- 2023+: Site Acceptance Test and start of delivery to ITER site

GKMP
RESEARCH & PRODUCTION COMPANY

Port Plug Test Facility for ITER Project

GKMP LLC passes the qualification process for ITER including the following resources:

(1) Clean room availability: **ISO 8 Clean Room** is available at GKMP production facility for assembly of large tonnage and high vacuum tanks and components. **Area: 1 400 m^2, height – 9m**.

(2) Quality control department has the following production and quality control procedures, approved by ITER:

-materials and components incoming control,

- procedure for materials and components traceability during production,

- RT and UT control of weld seams (UT with Phased Array Technique for 310mm weld seam),

- vacuum surface cleaning and polishing procedure,

- dimensional control procedure based on ITER Metrology Handbook,

- vacuum production philosophy based on ITER Vacuum Handbook.

GKMP
RESEARCH & PRODUCTION COMPANY

Научно-учебный центр "Контроль и диагностика"

СЕРТИФИКАТ КВАЛИФИКАЦИОННОГО ИСПЫТАНИЯ СВАРЩИКА
№ 1314-2019-01

EN ISO 9606-1 135 P BW FM5 S t12,0 PC ss nb
EN ISO 9606-1 135 P BW FM5 S t12,0 PF ss nb
EN ISO 9606-1 135 P FW FM5 S t12,0 PB sl

WPS № 1739, 1740, 1741
Фамилия, имя, отчество: Зинин Евгений Александрович (Zinin Evgenii)
Дата и место рождения: 11.05.1988 г., Россия
Место работы: ООО «НПО «ГКМП» («NPO «GKMP», LLC)
Стандарт, по которому проходил экзамен: EN ISO 9606-1:2017

ТЕОРЕТИЧЕСКИЕ ЗНАНИЯ	СДАН	
ТЕХНОЛОГИЧЕСКИЕ ПАРАМЕТРЫ СВАРКИ	ДАННЫЕ ОБ ЭКЗАМЕНЕ	ОБЛАСТЬ РАСПРОСТРАНЕНИЯ
Сварочный процесс(ы)	135	135, 138
Метод переноса	G	G
Тип продукта (пластина или труба)	P	P Толщина/диаметр: D ≥ 500 мм PA, PB, PC, PF

Научно-учебный центр "Контроль и диагностика"

СЕРТИФИКАТ КВАЛИФИКАЦИОННОГО ИСПЫТАНИЯ СВАРЩИКА
№ 1323-2019-01

EN ISO 9606-1 135 P BW FM5 S t12,0 PC ss nb
EN ISO 9606-1 135 P BW FM5 S t12,0 PF ss nb
EN ISO 9606-1 135 P FW FM5 S t12,0 PB sl

WPS № 1754, 1755, 1756
Фамилия, имя, отчество: Никитенко Александр Александрович (Nikitenko Alexander)
Дата и место рождения: 17.10.1978 г., Россия
Место работы: ООО «НПО «ГКМП» («NPO «GKMP», LLC)
Стандарт, по которому проходил экзамен: EN ISO 9606-1:2017

ТЕОРЕТИЧЕСКИЕ ЗНАНИЯ	СДАН	
ТЕХНОЛОГИЧЕСКИЕ ПАРАМЕТРЫ СВАРКИ	ДАННЫЕ ОБ ЭКЗАМЕНЕ	ОБЛАСТЬ РАСПРОСТРАНЕНИЯ
Сварочный процесс(ы)	135	135, 138

(3) Welders for stainless steel and carbon steel in addition to NAKS and Rosatom certificates have the **international/EN qualification as per ISO 9606-1.**

(4) Non-destructive test operators are qualified as per EN 9712 for visual, RT, Ultrasonic, LPT and MC control of weld seams.

(5) Drawings production as per European norms and standards.

НАУЧНО-УЧЕБНЫЙ ЦЕНТР КАЧЕСТВО

DAkkS Deutsche Akkreditierungsstelle D-ZP-16073-01-01

Сертификат № 47039-2019

Подтверждает, что

ПОПОВ АНДРЕЙ АЛЕКСАНДРОВИЧ
(Ф.И.О.)

Год рождения: 1985

Печать

Успешно сдал(а) экзамены и сертифицирован(а) в соответствии с требованиями ISO 9712:2012 по следующим методам НК

Метод	Уровень	Сектор	Дата выдачи	Срок действия
Визуальный и измерительный	2	b (f, t, wp, w)	16.08.2019	16.08.2024

НАУЧНО-УЧЕБНЫЙ ЦЕНТР КАЧЕСТВО

DAkkS Deutsche Akkreditierungsstelle D-ZP-16073-01-01

Сертификат № 46859-2019

Подтверждает, что

ТОРБИН АЛЕКСАНДР ВИКТОРОВИЧ
(Ф.И.О.)

Год рождения: 1970

Печать

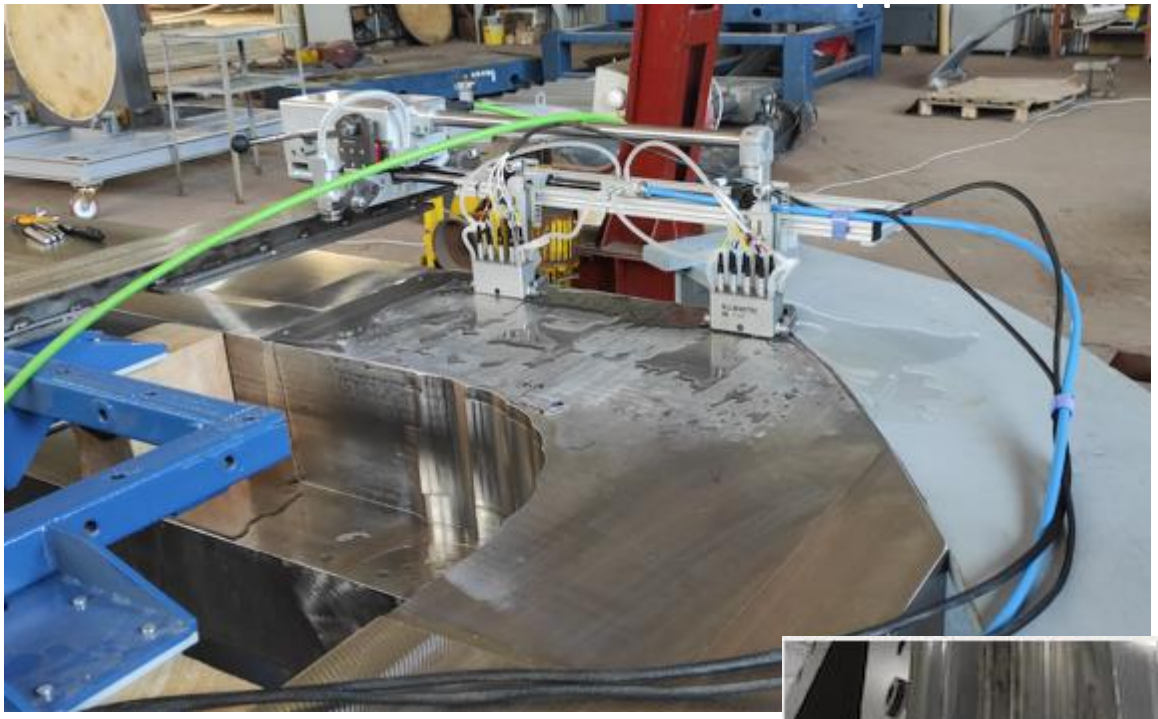
Успешно сдал(а) экзамены и сертифицирован(а) в соответствии с требованиями ISO 9712:2012 по следующим методам НК

Метод	Уровень	Сектор	Дата выдачи	Срок действия
Ультразвуковой контроль	2	b (f, t, wp, w)	16.08.2019	16.08.2024

(6) Work with Notify Body to approve PPTF subsystems as per European Directives (Mechanical, Low Voltage, Pressure Equipment Directive).

GKMP
RESEARCH & PRODUCTION COMPANY

Port Plug Test Facility for ITER Project



Ultrasonic control with Phased Array Technique for Stainless steel 1.4404 with thickness 310mm. Forward Flange of the Vacuum Chamber

Ultrasonic control with Phased Array Technique for Stainless steel 1.4404 with thickness 310mm. Forward Flange welding with Vacuum Chamber

GKMP
RESEARCH & PRODUCTION COMPANY

Electro-thermal equipment

GKMP
RESEARCH & PRODUCTION COMPANY

Electro-thermal equipment

LLC «NPO GKMP produces vacuum coating equipment of mainly resistive and magnetron types. By prior agreement with a customer, it is possible to produce sputtering vacuum equipment with electron beam evaporation. Thanks to the in-the-house production of heating elements, magnetrons, vacuum chambers, hermetic inlets, transport boxes, force transfer mechanisms and other high-tech elements, a customer is able to obtain a sputtering vacuum equipment of the required configuration.

MAP MAP-2 MAP-3
Coating equipment

UVN-71, UVN-74
Coating equipment

GKMP
RESEARCH & PRODUCTION COMPANY

Growth equipment

Equipment for growing leuco-sapphire monocrystals by horizontally directed crystallization (HDS) method

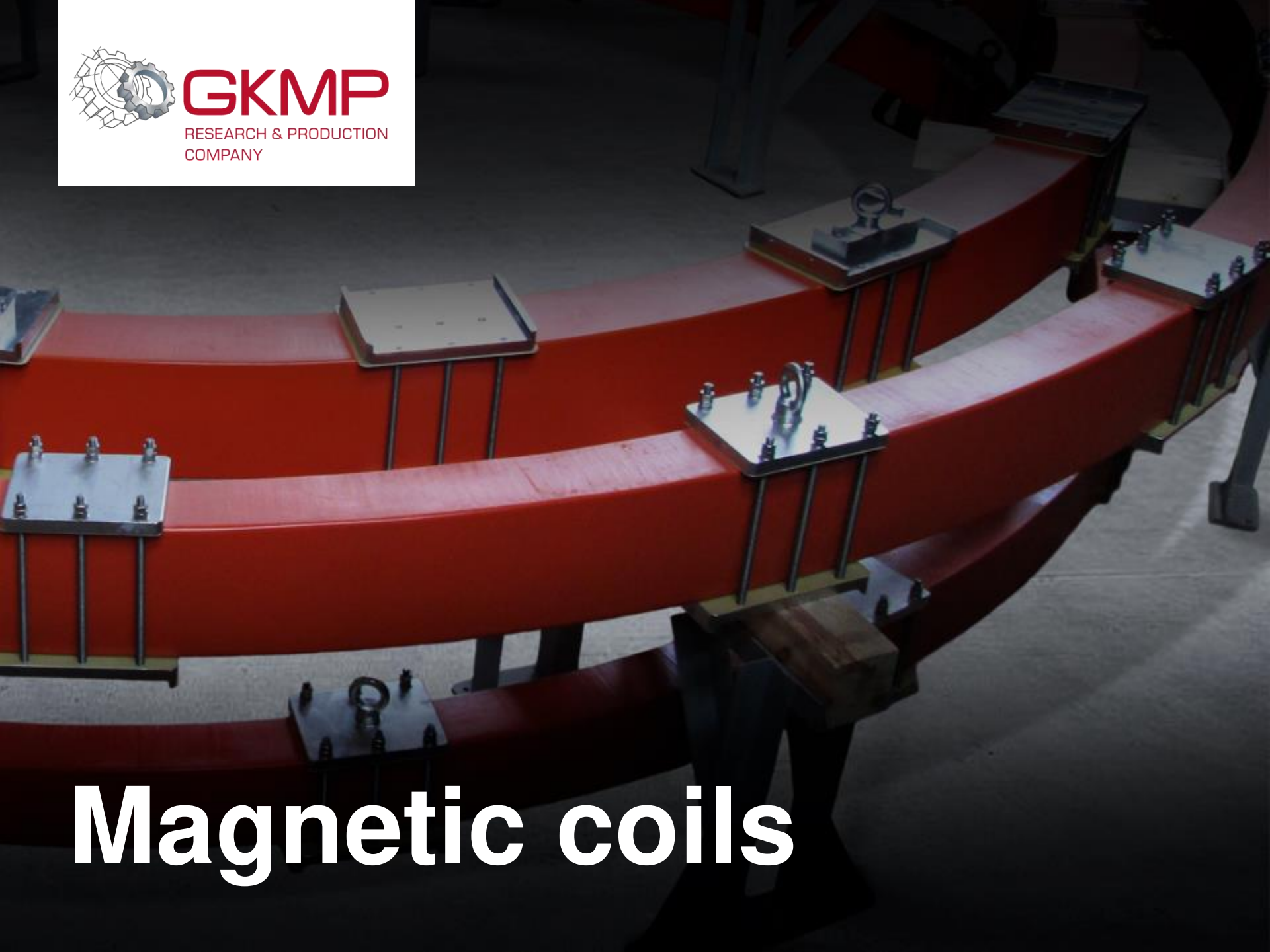
Growth equipment

Crystal growing is a technological process of crystallization carried out to obtain a monocrystal or films from different materials.

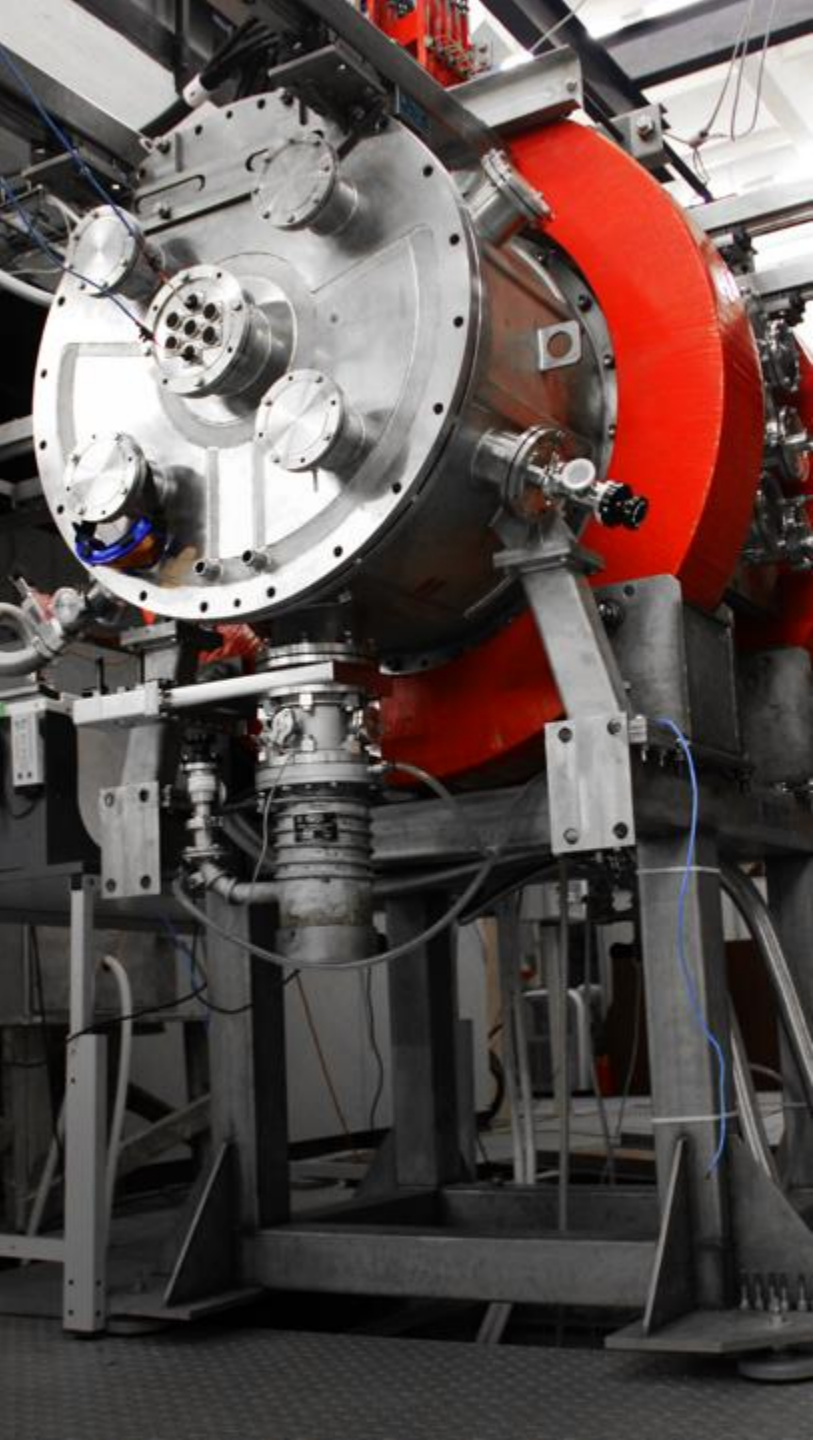
Types:

- equipment for growing **silicon** crystals by the Czochralski method;
- equipment for growing **leuco-sapphire** monocrystals by horizontally directed crystallization (HDC) method;
- equipment for growing **leuco-sapphire** monocrystals by Kyropoulos method;
- equipment for growing **Indium Antimonide** monocrystals;
- equipment for growing monocrystals from **gallium arsenide and indium.**

GKMP
RESEARCH & PRODUCTION COMPANY



Magnetic coils



Magnetic coils

GKMP manufactures various electromagnetic coils with a diameter up to 8000 mm, using its own devices and equipment for winding coils, devices to handle sections and traverses to move the products manufactured.

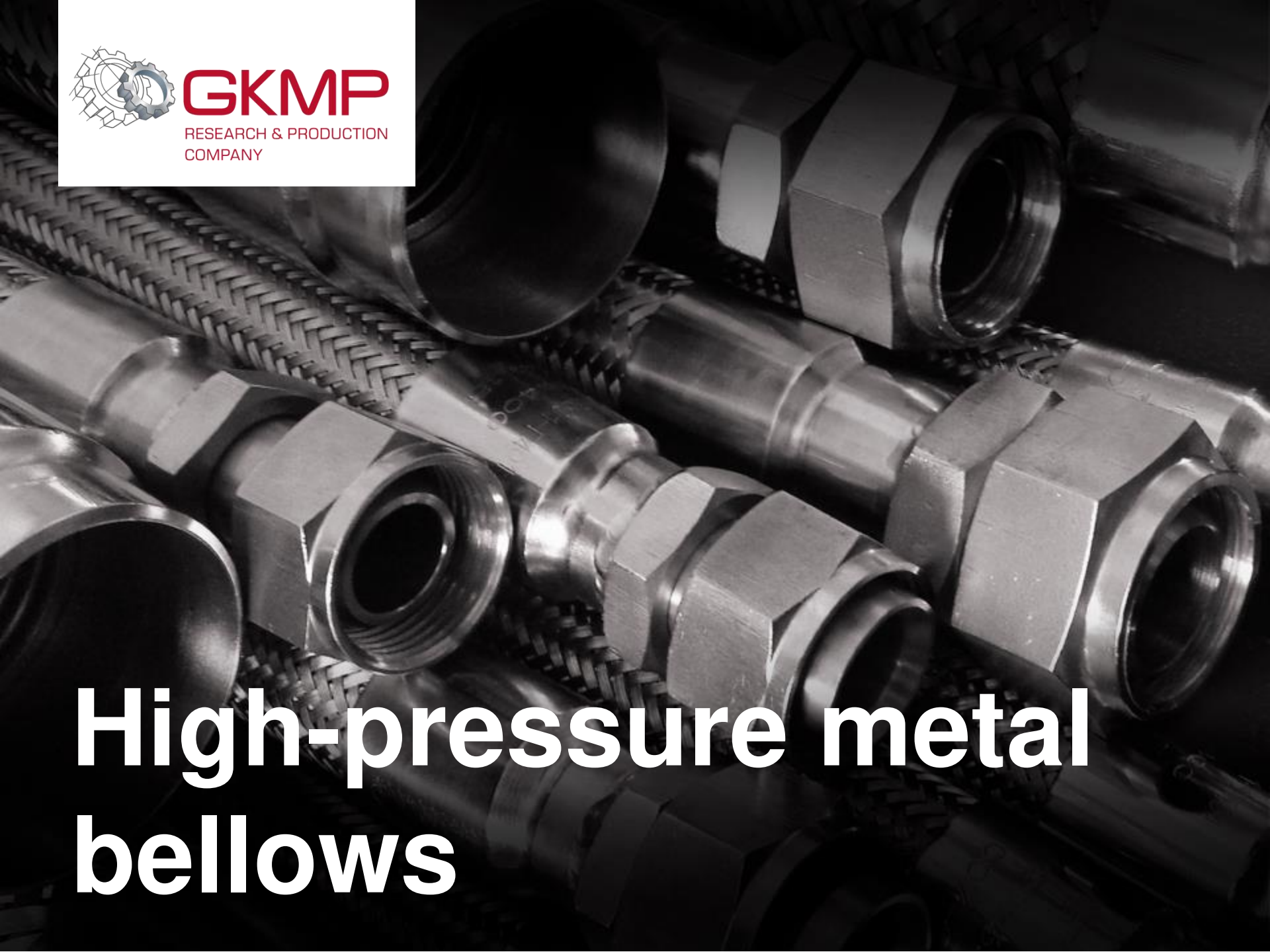
A vacuum chamber was developed to sinter electrical insulation; crimping tool kits; table for the manufacture and winding of coils; specialized storage racks for sections.

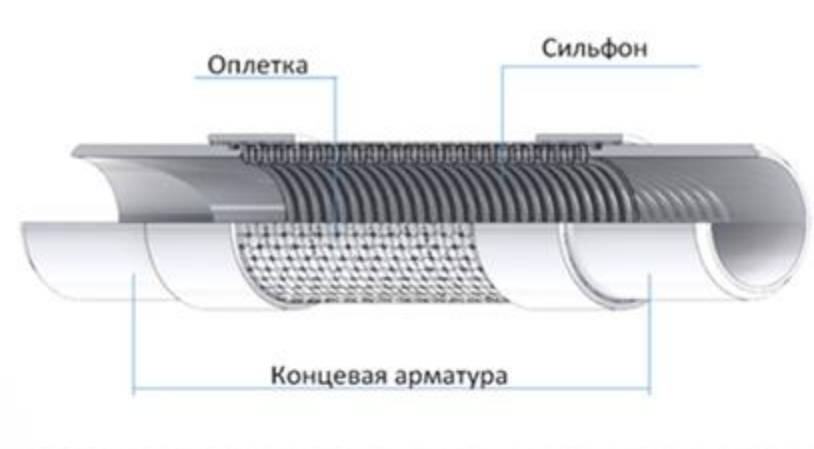
The implemented projects include coils for the Tokamak T-15 thermonuclear reactor, designed to create a toroidal magnetic field; control winding coils; U-400M cyclotron coils, etc.

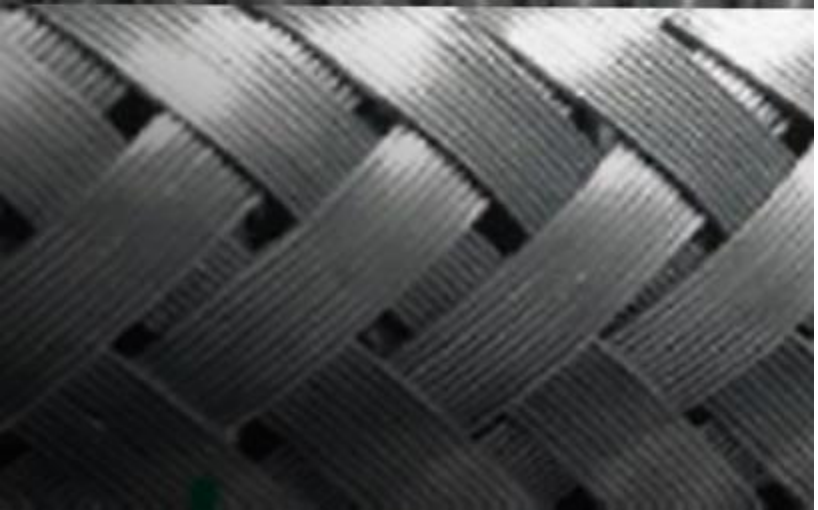
Coil types:

- Magnetic coils
- Coil winding (Solenoid)
- OTP coils
- Coil manufacture devices OTP, OU
- Coils OUZ, OU4, OU5

GKMP
RESEARCH & PRODUCTION COMPANY


GKMP
RESEARCH & PRODUCTION
COMPANY
High-pressure metal
bellows





Stainless steel metal bellows and hoses

One of particular line of business for the GKMP is the production of high pressure metal hoses designed for flexible connection of piping systems, aimed at reducing the installation, thermal, vibration and other types of stresses generated within rigid pipelines.
The company managed to implement a closed-loop production cycle starting with the pipe molding, bellow manufacturing and -one, -two or three layer protective braid.

Parameters:

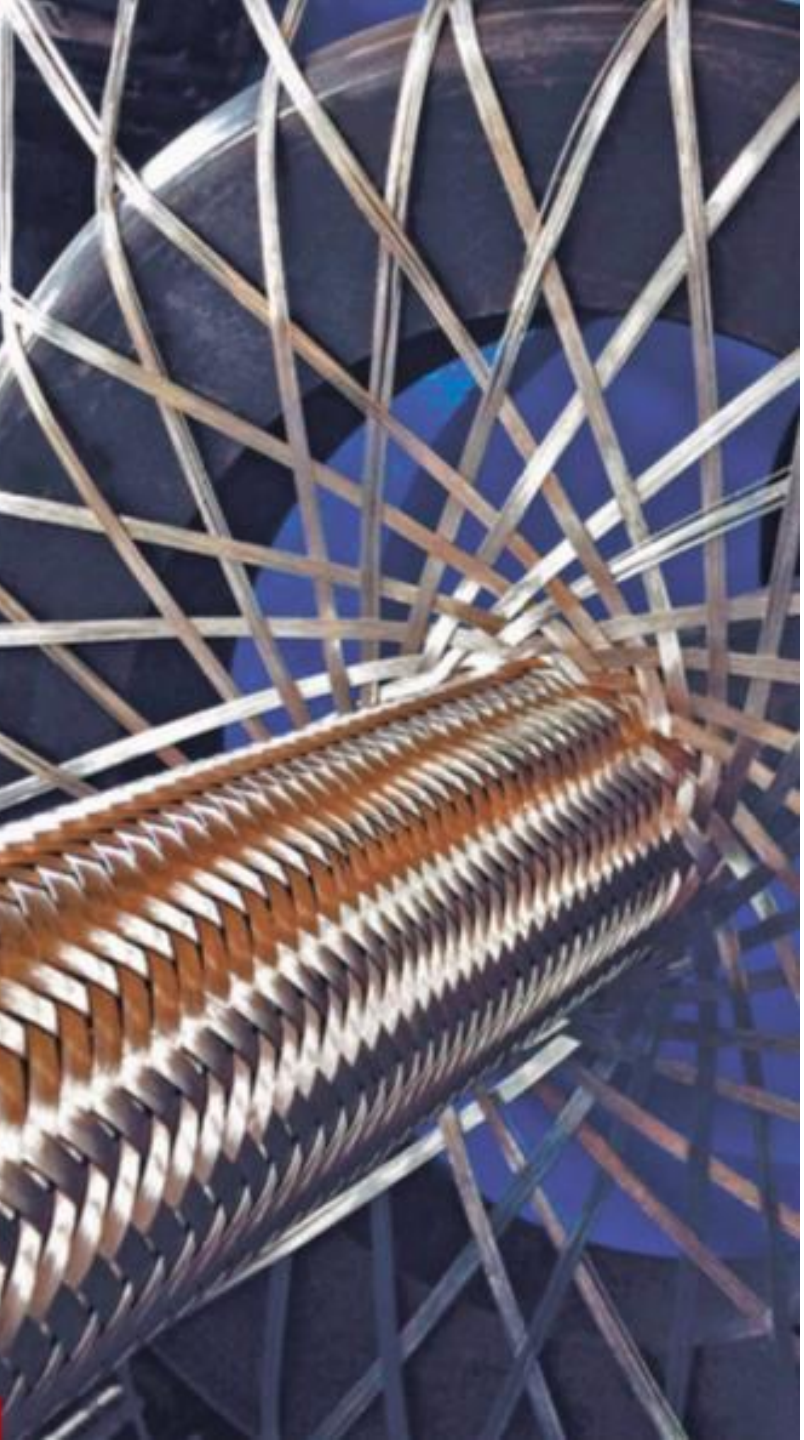
- Temperature from -270 to +600˚C,
- Vacuum pressure up to 44.0 MPa.

Bellow types:
1 - Standard;
2 - Lightweight;
3 – High flexible;
4 – High strength;

Protective braids :
0 – no braid;
1 - single;
2 - double;
3 - triple.

The Main materials used to manufacture bellows and braids:
08X18H10T (AISI 321 or 1.4541), 12X18H10T (AISI 321 or 1.4541), 12X18H9T (AISI 321 or 1.4541), 08X18H10 (AISI 304 or 1.5301), 08X17H13M2T (AISI 316T or 1.4573), 03X17H14M3 (AISI 316L or 1.4435, AISI 316 or 1.440).

GKMP
RESEARCH & PRODUCTION COMPANY



Stainless steel metal bellows and hoses

The braid of a high-pressure metal hose is an important component that directly affects technical characteristics of a finished product, mostly its ability to withstand the necessary parameters of the operating pressure: insufficient strength characteristics of a metal hose equipped with a single braid (one layer of wire strands) requires the second or even the third layer is applied .

The braid is an external part of a high-pressure metal hose, which consists of stainless steel wire strands, depending on the diameter, from 0.3 mm thick.

Stainless steel wire braid is made of special cutting-edge braiding machines. The braid performs not only a protective role, protecting the internal flexible bellows of the sleeve from mechanical stress and harmful environmental factors.

Basic parameters

DN * from 6 to 16 mm (Pmax from 1.1 to 44.0 MPa);
DN from 20 to 50 mm (Pmax from 0.4 to 16.0 MPa);
DN from 65 to 250 mm (Pmax from 0.03 to 6.0 MPa);
DN 300 mm (Pmax 0.03 to 1.3 MPa);
length from 0.3 to 6 m *;
operating temperature from -270 ° C to + 600 ° C


GKMP
RESEARCH & PRODUCTION
COMPANY
Products from
refractory metals and
alloys

Products from refractory metals and alloys

GKMP managed to develop a unique technology enabling to produce tungsten fitting-out by welding **tungsten**.
Treatment of tungsten is possible only at high temperatures as in nominal conditions this material is rather crumbly.

Tungsten application:

- As a fitting-out for high-temperature hydrogen and vacuum furnaces;
- To manufacture cathodes; as a basis for non-consumable welding electrodes;
- while glass manufacture (melting electrodes and tungsten mixers);
- For hot metal pressing;
- To manufacture heat-resistant rocket parts in the space industry;
- To use as screens to attenuate radioactive radiation flux in nuclear power, etc.

Products made from tungsten alloys are characterized by durability, strength and high quality.

GKMP
RESEARCH & PRODUCTION COMPANY

Products from refractory metals and alloys

GKMP provides its customers a wide range of **molybdenum** items manufactured per custom drawings: crucibles, boats, rods, hairpins, rings, molybdenum heaters, etc.

Molybdenum is slightly inferior to tungsten in terms of mechanical strength, but it is easier to process by pressure. In addition, due to the lower density (in comparison with tungsten), molybdenum-based alloys have a higher specific strength (at temperatures below 1370 °C).

At the same time, the price of molybdenum is slightly lower than that of tungsten. Due to its properties and qualities, molybdenum is one of the main industrial metals and is widely used in the electro - vacuum and radio - electronic industries, in special machine and instrument engineering, aircraft and rocket engineering.

Molybdenum is often used as an alloying additive to a variety of alloys to improve the strength characteristics of the latter.

GKMP
RESEARCH & PRODUCTION COMPANY

Products from refractory metals and alloys

High-temperature ceramics

Ceramics based on silicon carbide (SiC), Ceramics based on zirconia (ZrO2), Ceramics based on alumina (Al2O3), Ceramics based on ZTA Ceramics based on boron nitride (BN)

Silicon carbide ceramics

Ceramic based on silicon carbide (SiC) ensures the high heat resistance and the highest performance of a product. The main advantage is the resistance of the material to temperature extremes, high corrosion resistance and stable product dimensions.

Zirconium dioxide ceramics

Products made of technical ceramics based on stabilized zirconium dioxide are chemically inert (do not react with aggressive substances).

Aluminum oxide ceramics

Products from aluminum oxide (alumina, corundum) are in demand more than any other high-quality ceramic material.

ZTA based ceramics

ZTA material is more often used to manufacture insulators, sensors, piston bushings and pump components, components of the fluid supply system, housings and carriers of LED chips

Boron nitride ceramics

Boron nitride products are widely used in items produced by high-temperature techniques.

GKMP
RESEARCH & PRODUCTION COMPANY

Products from refractory metals and alloys

Compared with graphite, **Carbon-carbon composites** are characterized by low density (due to the porosity of the material), high specific strength and rigidity, that remain intact indefinitely in inert media at temperatures up to 3000 ° C (at higher temperatures, the properties depend on the rate of sublimation of carbon from the surface of the material), and nature of destruction.

Carbon composite products

A lightweight, heavy-duty composite material that can withstand temperatures above 3000 ° C in different environments.

Soft graphite felt

We offer 2 types of graphite soft felt:
- Carbon fiber based on polyacrylonitrile (PAN-based);
- Carbon fiber based on viscose.

Technological screens and furnace tools

Due to their unique properties, products and parts made of carbon-carbon composite materials are widely used for thermal treatment as heat-resistant jig for high-temperature furnaces.

Hard graphite felt

Hard graphite felt is a dimensionally stable insulation material made of graphite fibers and a carbon-based binder.

Carbon-carbon parts and fasteners

Bolts, screws, nuts, studs and solid fasteners from UUKM for using in high temperature environments.

Dmitry Alfimov,
Deputy Director General
+ 7 916 339 8890

Olesya Solovyeva,
Director of ITER Project Office
+ 7 915 420 0574

121327, Moscow, Mozhayskiy intracity territory of a federal city, Tolbukhina street 10, bld 2, office 2, room 11 Tel.: +7 495 150 14 50

241022 Bryansk, 7 Shorsa boulevard Tel.: +7 4832 58 19 66

gkmp@gkmp32.com