St. Petersburg

Moscow

Perm

Samara

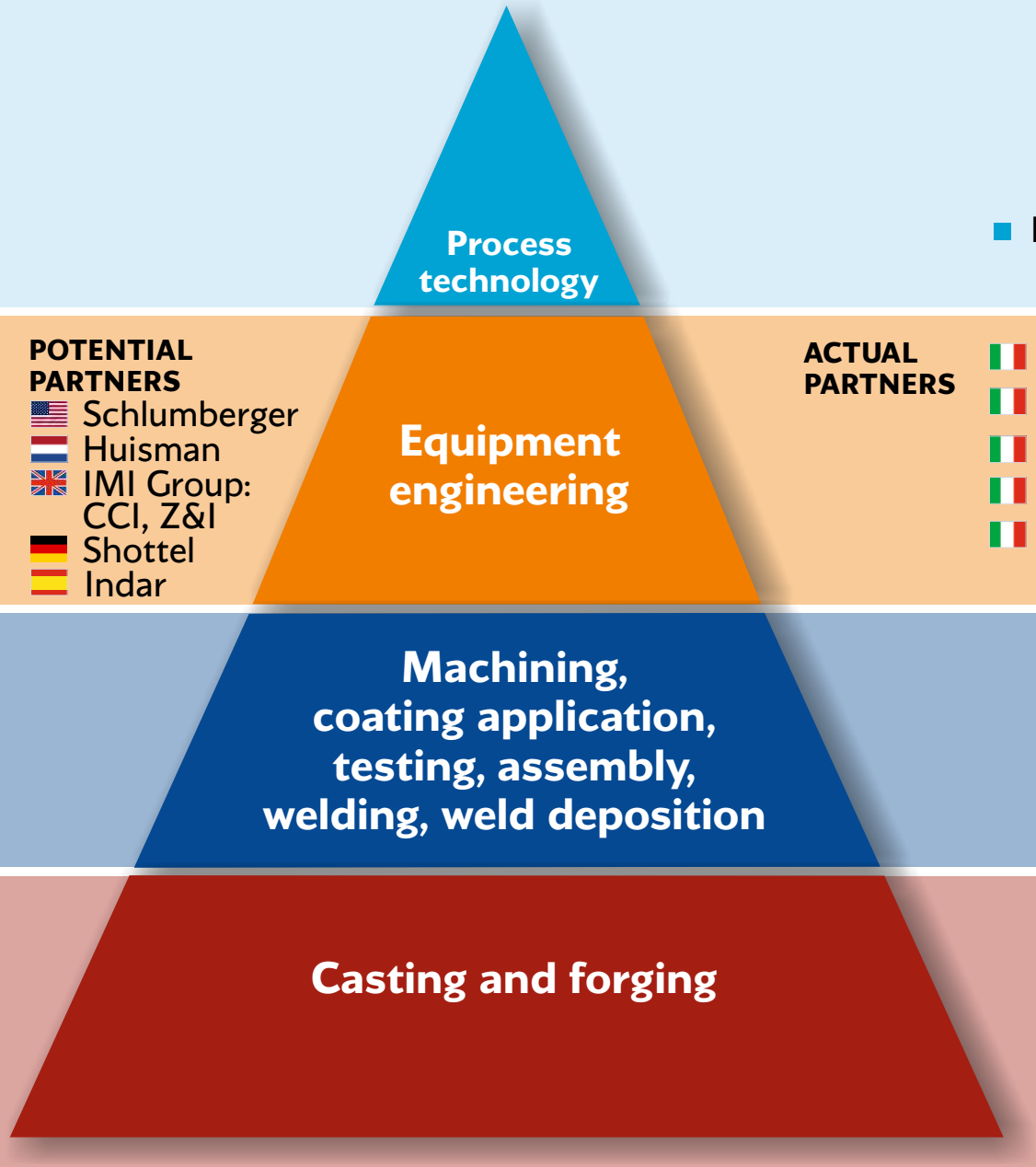
Chelyabinsk

MADE IN RUSSIA!

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

2022

Strategical model of KONAR Industrial Group



- Licensors

POTENTIAL PARTNERS

- Schlumberger
- Huisman
- IMI Group: CCI, Z&I
- Shottel
- Indar

ACTUAL PARTNERS

- CIVIDALE S.p.A.
- ORION S.p.A.
- Termomeccanica Pompe S.p.A.
- Cimolai S.p.A
- BREDA
- ABB
- Kanigen
- General Electric
- Siemens

- KONAR
- Stankomash
- JV KONAR-Cimolai
- Kornet
- ESCON
- Transneft Oil Pumps
- Transneft — Russian Electric Motors
- Ural Sealing Technologies
- KONAR-ORION

- BVK — foundry
- Modern Forging Technologies

KONAR Industrial Group

- Foundation year – 1991.
- Given turnover – 60 bln rubles for 2020.
- Personnel number – 4500 persons.

FOUNDRY & FORGING DIVISION

MACHINING DIVISION

RESEARCH & DEVELOPMENT AND ENGINEERING CENTER

METAL STRUCTURES DIVISION

Experience in implementing large infrastructure projects

The Pipeline Supports Project for the main oil pipeline Zapolarye-Purpe. The above-ground method of laying in permafrost conditions was used for the first time. The contract amount – 14 bln rubles, over 20 000 supports, the time period – 1.5 years.

The stadiums for the World Cup in Nizhny Novgorod, Volgograd, Kola yard, Lakhta Center - a total volume of over 120 kt of metal structures for 2 years, production and installation.

Packaged supplies of process equipment for oil refineries of the Russian Federation – selection of equipment, coordination with design institutes, supervision, logistics - over 20 bln rubles.

Turnkey plants construction – design, construction, equipment supply, installation, personnel training.

- Foundry
- Valves Production Plant
- Forging Plant
- Metal Structures Plant
- Pumping Units Production Plant
- Electric Motors Production Plant

The ESPO Project – design, production, erection supervision of 69 pumping units worth over 20 bln rubles.

Stankomash Industrial Park, Chelyabinsk

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

BVK LLC — JV with Gruppo Cividale S.p.A. (Italy) for foundry production.

KONAR JSC — machining, testing and assembly as well as welding facility.

Kornet LLC — manufacturing of pipeline valves and equipment for oil production. Nickel-plating line with application of silicon carbide nanoparticles according to Kanigen technology (Japan).

KONAR-ORION LLC — JV with c Orion S.p.A (Italy) for production of pipeline valves for critical application up to -196°C.

Research and Development Center, KONAR JSC – laboratory of bench tests, cryogenic tests, material science, cryogenic tests, 3-D modelling and prototyping.

KONAR JSC – workshop of automated hot-forming machines

JV KONAR-Cimolai LLC — JV with Cimolai S.p.A. (Italy) for production of special metal structures.

Transneft Oil Pumps JSC — production of main line and booster oil pumps. Joint venture of Transneft PJSC with Termomeccanica Pompe S.p.A. (Italy) and KONAR JSC.

Russian Electric Motors JSC — production of electric motors up to 45 MW. Joint venture of Transneft PJSC with KONAR JSC with technological support of Nidec ASI S.p.A. (Italy, Japan).

Area of Stankomash Industrial park (owned by managing company and residents)	**189 Га**
Area of active production and facilities under construction	**55 Га**
Territory occupied by motor roads and parkings	**13 Га**
Areas for development	**121 Га**

Our process partners

Gruppo Cividale (Italy) – one of the leading iron and steel companies in Europe, implementation partner in joint foundry production – BVK LLC.

Cimolai S.p.A. (Italy) – one of the world leaders in development and production of high-complexity metal structures. Implementation partner in joint production of metal structures — JV Konar-Cimolai LLC.

Termomeccanica S.p.A. (Italy) – one of the world leading manufacturers of pumping equipment. Establishment partner of pumping units joint production – Transneft Oil Pumps JSC.

Orion S.p.A. (Italy) – one of the world leading manufacturers of pipeline valves, including cryogenic execution (for -196°C operation conditions).

Nidec S.p.A. (Italy) – one of the world leading manufacturers of electric motors, with wide capacity range of products (up to 70 MW).

BREDA – one of the earliest companies in Italy for transport and military machinery building. Established in 1886. Endowed with process technologies for production of wellhead equipment.

Kanigen (Japan) – takes leading positions in process technologies for special coating of the products (including chemical nickel-plating).

GE (USA) – machinery building world leader in the area of energy sector, shipbuilding, aero-engines.

Ventil Test Equipment (Netherlands) – one of the world leading manufacturers of high-pressure testing equipment for pipeline valves.

ABB Oy, Marine & Ports (Finland) – complex marine systems. ABB – process leader in the area of electrical grids, equipment, industrial automation, robotics.

O.M.S. Saleri S.p.A. – one of the earliest Italian machinery building companies. Has rich experience in production of ball valves with high performance capabilities for oil and gas industry.

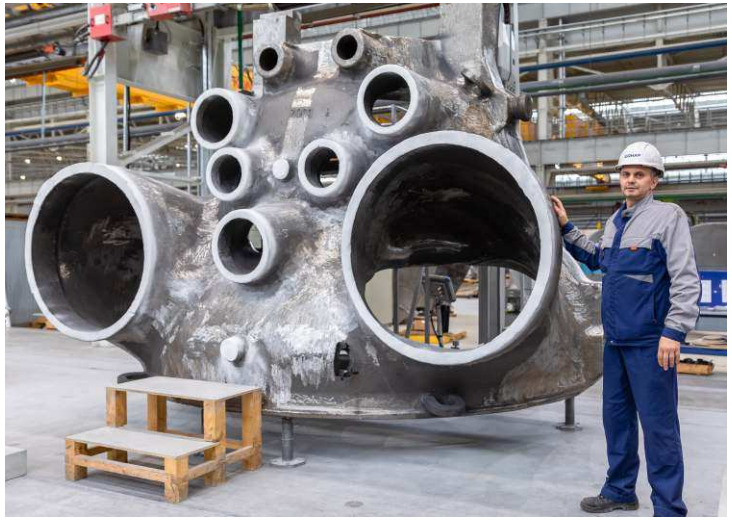
Indar (Spain) – global leader of mechanical engineering with regard to production of generators and electric motors.

IMI Group: CCI, Z&I – British engineering company, one of the world leaders for supply of control processes for critical flows in nuclear, energy and oil and gas industry.

BVK LLC — joint foundry with Cividale S.p.A., a European leader in metallurgy

- Manufacturing area – 35 000 m^2
- Electric arc steelmaking complex with ladle refining and vacuum treatment EAF + LD + VOD
- Large castings up to 30 t
- Production capacity 35 000 t per year
- Carbon, stainless, heat-resistant steel
- Duplex, Superduplex

Capacities of blanks production



Castings of large pump casing, pipeline valves up to 30 t

Gas turbine case

Arctic gas carrier blade. Weight 10 t. Height 2.5 m

Modern Forging Technologies LLC

Modern Forging Technologies LLC is a plant for forging of cast ingots. It is a part of foundry and forging division of KONAR group together with BVK LLC (Chelyabinsk) and Kuznitsa LLC (Volgograd region).

MFT plant was built and launched for 1.5 years.

A technological partner of MFT LLC is an Italian company Cividale S.p.A., a partner of KONAR JSC within BVK foundry.

Modern equipment is installed at the facility. It is represented by VECCHIATO forging complex that includes a hydraulic press, railbound and mobile manipulators, heat treatment complex produced by BOSIO.

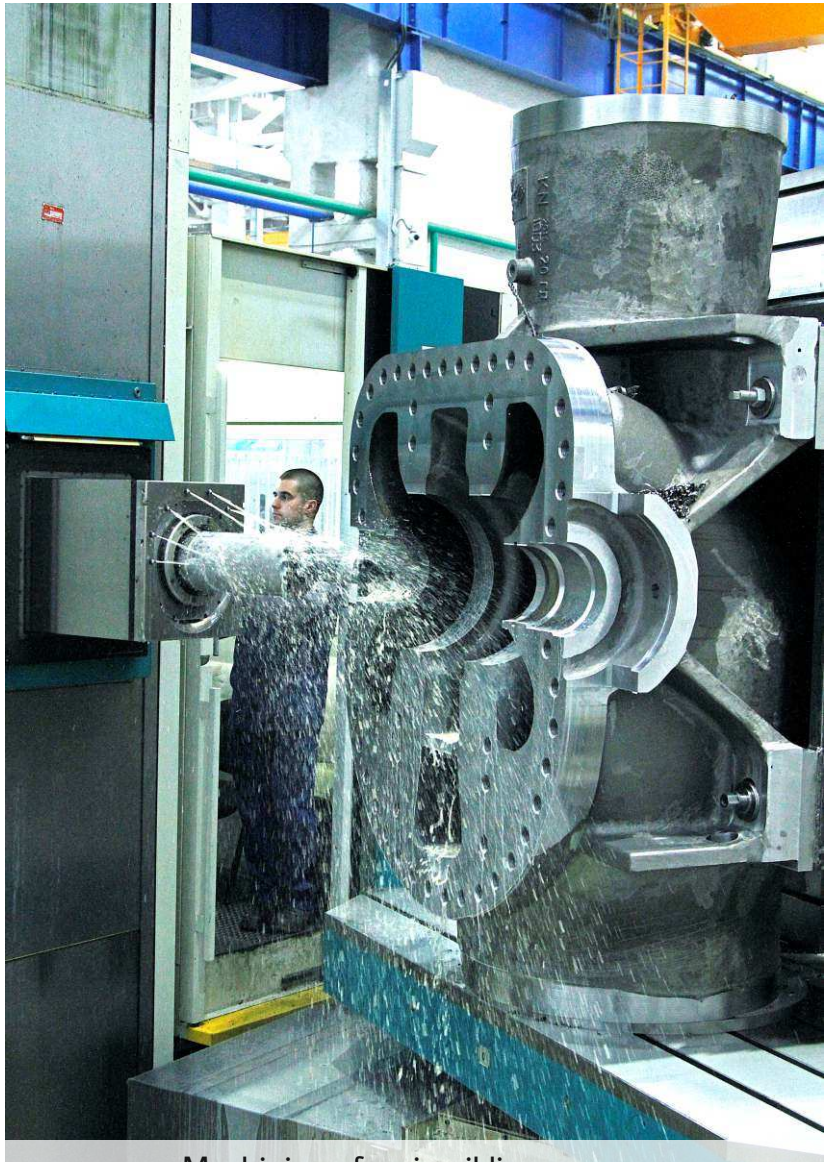
Modern Forging Technologies LLC

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

Steam turbine high pressure rotor

Blanks with hole punching

PAMA SPEEDRAM 3000 –
horizontal machining center



Machining of main oil line pump
cover MOL 10000

Machining of main oil line pump
body MOL 10000

Competencies of KONAR Industrial Group

Horizontal and vertical lathe machining centers

Machining of gate valve body DN 1000

Large-sized pipeline valves production

Kornet LLC is a producer of pipeline valves, gate valves, X-mas trees and wellhead equipment that comply with advanced international standards and requirements for the quality of materials.

The company produces pipeline valves according to a complete closed process cycle – from blanks to assembly, tests and quality inspection of a finished product, which is due to a deep integration within KONAR Industrial Group. The emphasis is on production of large-sized valves. A package supply of any oil and gas equipment is possible.

Kornet LLC has its own raw material supplies base, engineering department, welding area, performs heat treatment, assembly, pneumatic-hydraulic tests, applies paint and electroplating coatings. Kornet LLC is the only company in Russia that nickel-plates its components.

Shut-off & control valves with a standard size up to DN 1200

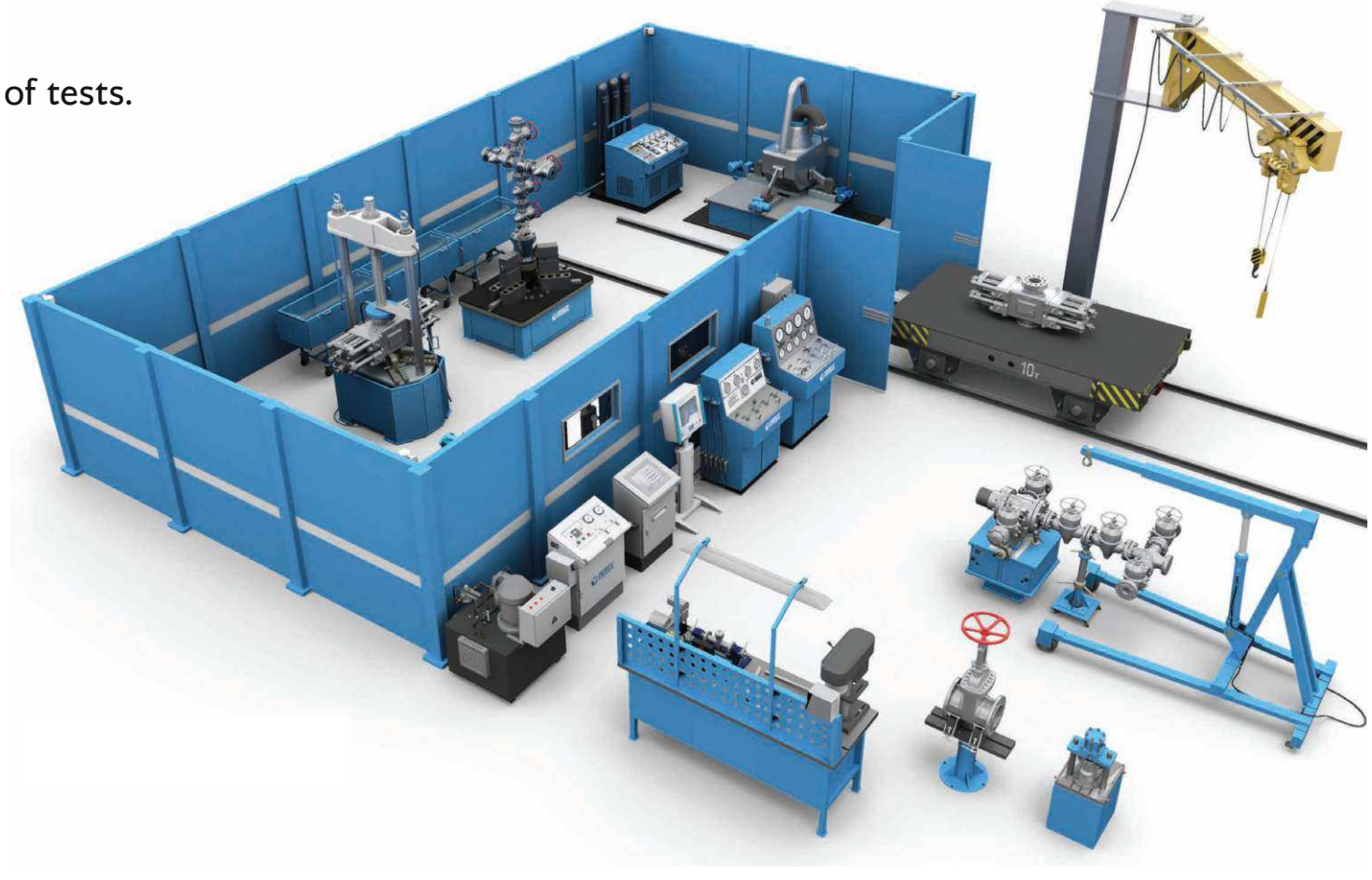
Kornet LLC and KONAR-Breda

Special testing center for wellhead equipment

Test bench application:

- hydraulic and pneumatic tests for strength and density of wellhead equipment material
- leak test against environment
- gate tightness test

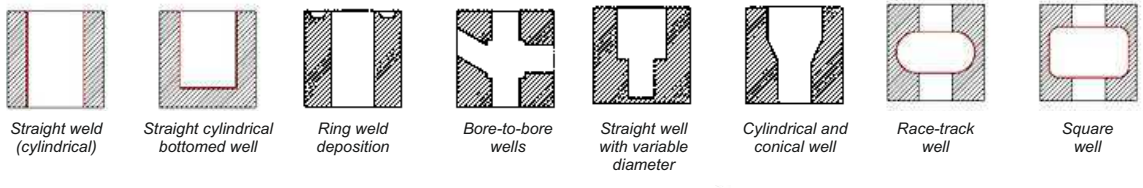
Test pressure up to 160 MPa.
Armor barrier with remote control of tests.



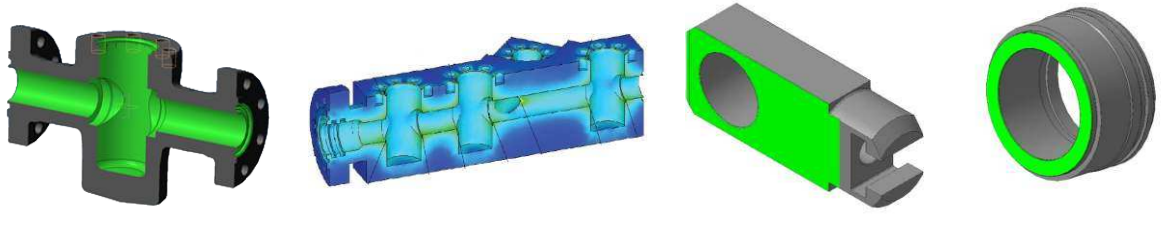
Kornet LLC and KONAR-Breda

Equipment for automatic weld deposition of wellhead equipment components

Automatic weld deposition unit Fronius for weld deposition of crossing polysurfaces of X-mas trees of configurations K1, K2, K3, K3+ with corrosion and wear resistant materials and automatic plasma-powder weld deposition unit Delore for weld deposition of the oil-filled valve gate “metal-to-metal”.



Straight weld (cylindrical) | *Straight cylindrical bottomed well* | *Ring weld deposition* | *Bore-to-bore wells* | *Straight well with variable diameter* | *Cylindrical and conical well* | *Race-track well* | *Square well*



Production of pipeline valves for a special application

KONAR-ORION LLC is a Russian-Italian production of pipeline valves for low-temperature media. The leading European producer of pipeline valves Orion S.p.A. (Italy) became the technological partner of KONAR.

All products are made from the best raw materials. Machining is performed on advance equipment using the most up-to-date methods. Products are tested and inspected to ensure strict compliance with current standards.

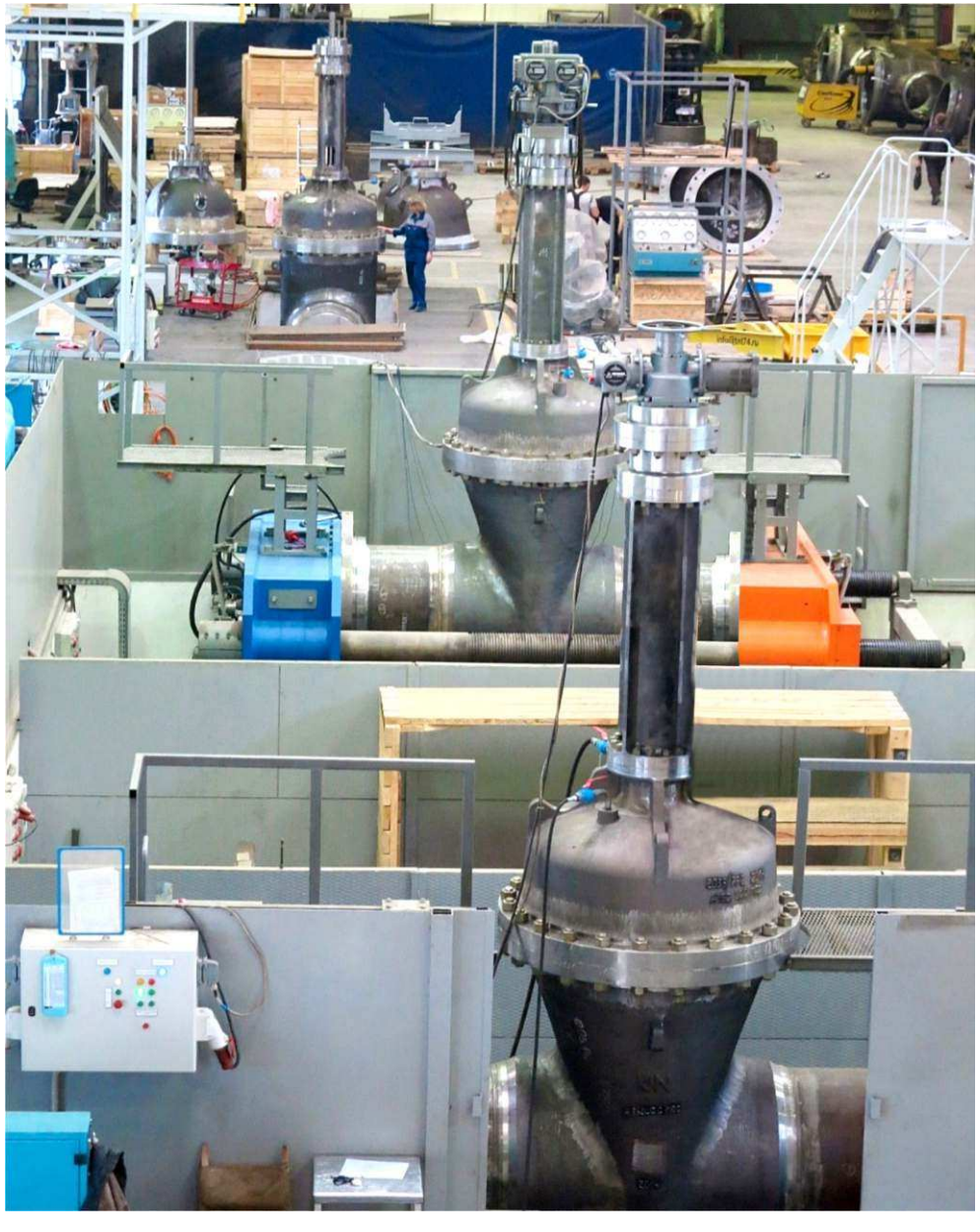
Nowadays, production of dynamic and static equipment was arranged for one of the largest projects in Russia – Arctic LNG-2. Products produced by KONAR-ORION are capable of operating at a temperature of -196^{0}C.

For tests and confirmation of their characteristics, the only cryogenic center in Russia was constructed and launched at RDC-Konar LLC.

Specialized pipeline valves for petrochemical and gas processing plants, including a cryogenic design.

Assembly and testing facility

Hydrotests



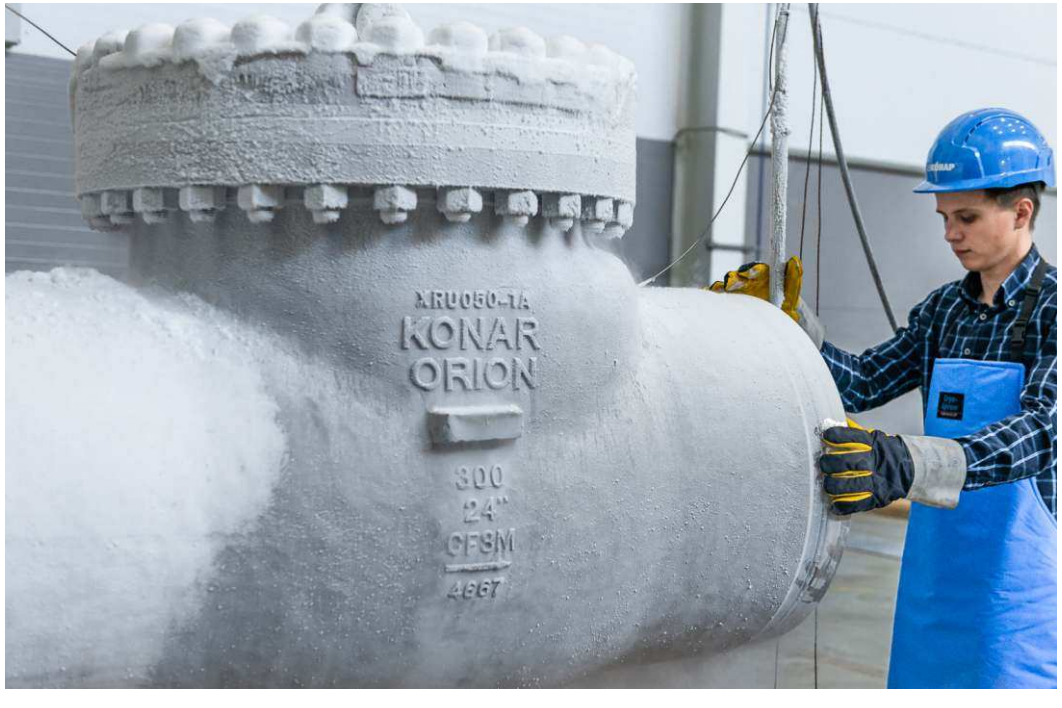
Cryogenic tests center (down to –196˚C) as a part of Research and Development Center, KONAR JSC

KONAR JSC is a project investor
Ventil (the Netherlands) is a general contractor
Linde AG is a process partner

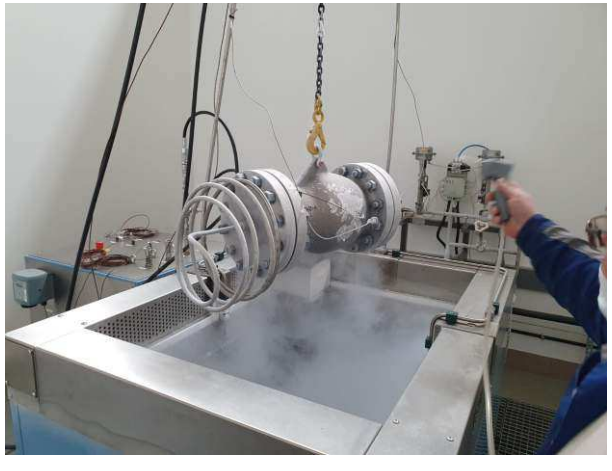
Special laboratory of cryogenic tests is a part of Research and Development Center.

Testing capabilities:

- pressure range up to 300 bar
- temperature range: from ambient temperature to - 196°C
- dimensions of cryogenic test tanks up to 1000 x 1600 x 1000 mm
- test gas: helium, nitrogen, gas mixtures



Konar-Orion Valves Projects



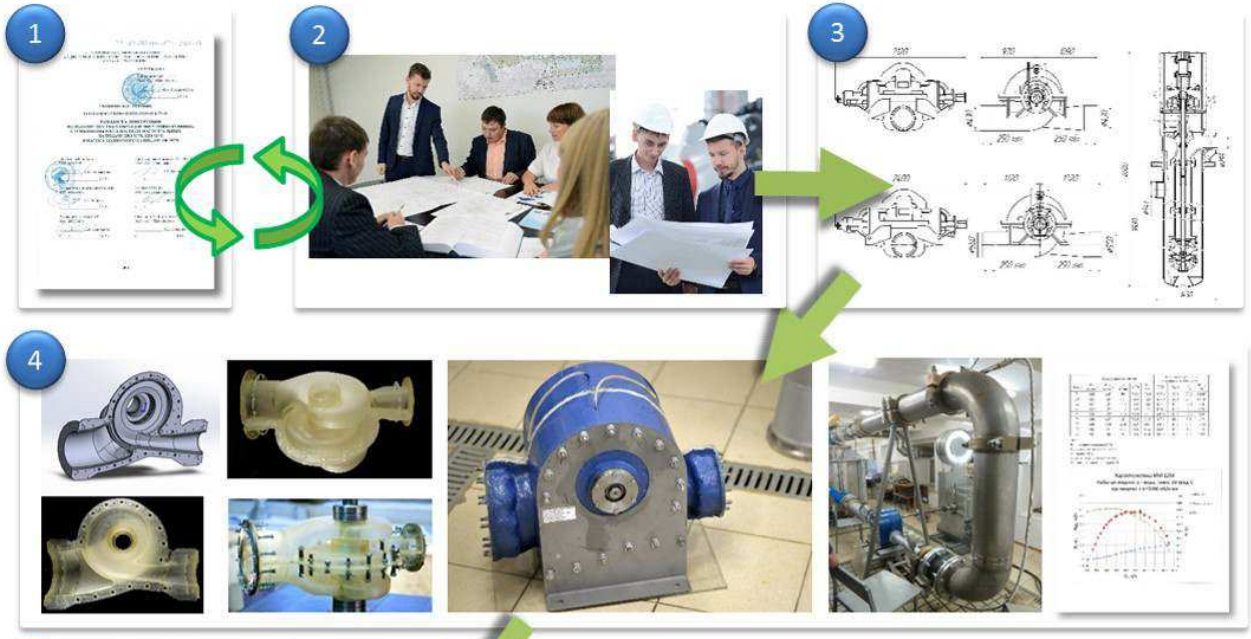
▲ Arctic LNG-2 GBS, axial check valve according to API6D RA 6″-16″ 300RF CF8 36 pcs.;

▲ Omsk Lubricants Plant, hydroisodewaxing unit HIDW, gate valve, stop valve, check valve DN 15-250 PN16, 40, 63, 100 20ГЛ, 09Г2С, 08Х18Н10Т 2214 pcs.;

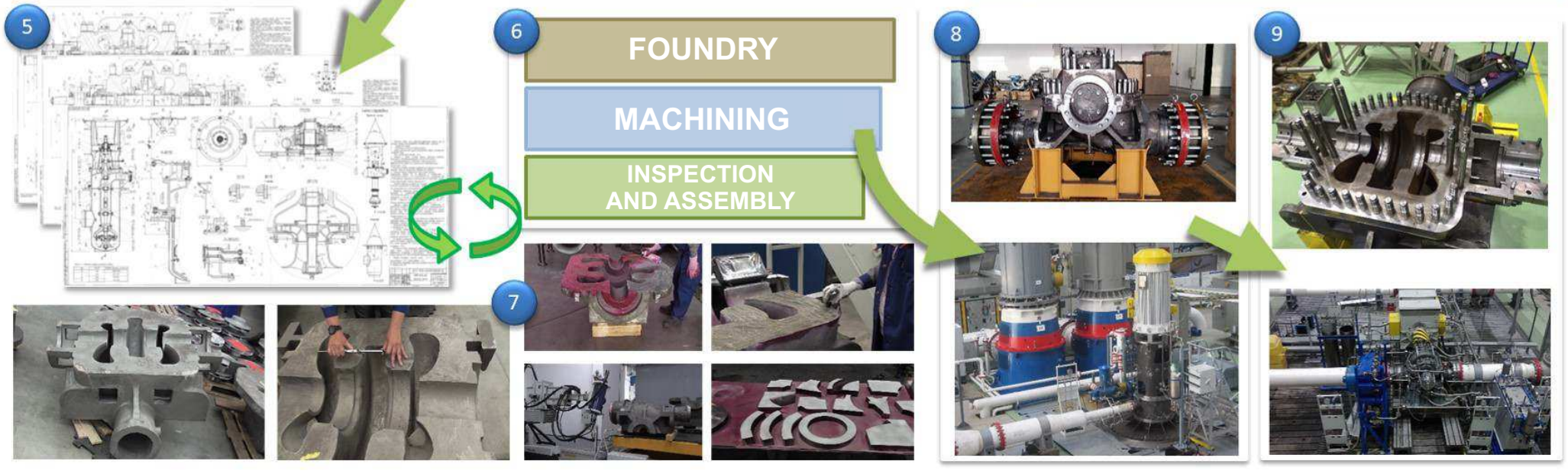
▲ Moscow Oil Refinery, sulphur recovery unit SRU, gate valve, stop valve, check valve DN 50-400, PN16, 25, 40 20Л, 20ГЛ 3318 pcs.;

▲Moscow Oil Refinery, hydrocracking and hydrogen production units HCU/HPU, gate valve, stop valve, check valve, butterfly valve DN 50-1000, PN16, 40, 63 20Л, 20ГМЛ 1173 pcs.

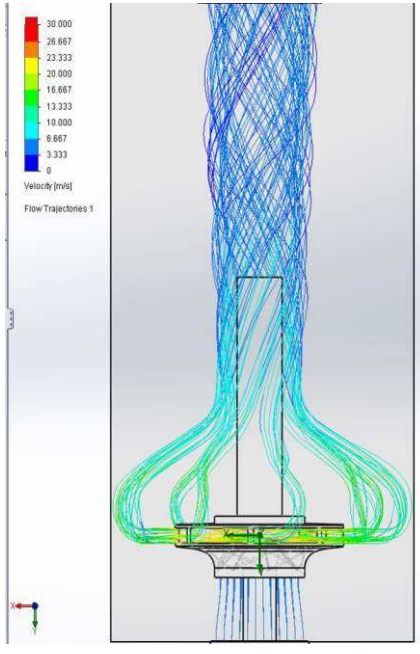
Engineering Department

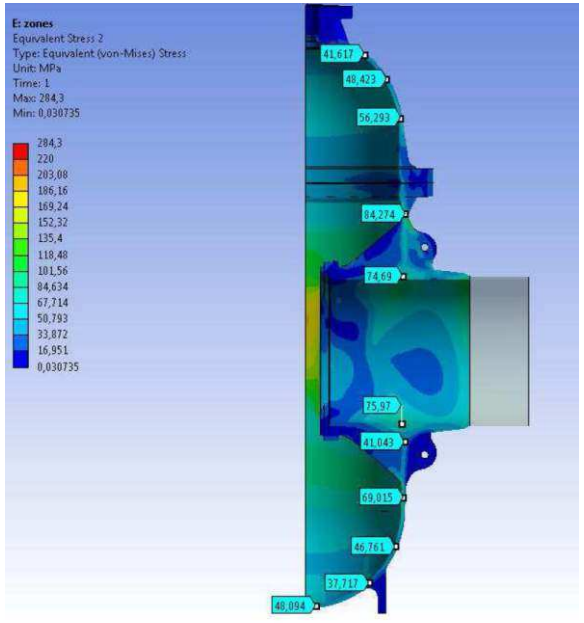


№	Activity
1	Preparation and approval of the technical specification
2	Creation of the engineering team to perform R&D work
3	Development of options and selection of a final draft design
4	Test of high-precision scale 3D-models made using additive processes
5	Development of design documentation for full-scale equipment samples
6	Preparation of process flow and production of prototypes of large body parts
7	Confirmation of compliance of the quality of pump body parts with the requirements of design documentation by non-destructive and destructive test methods
8	Production of pump prototypes, performance of hydraulic and preliminary bench tests
9	Finalization of design documentation and prototypes, acceptance tests, confirmation of compliance with the requirements of the technical specification

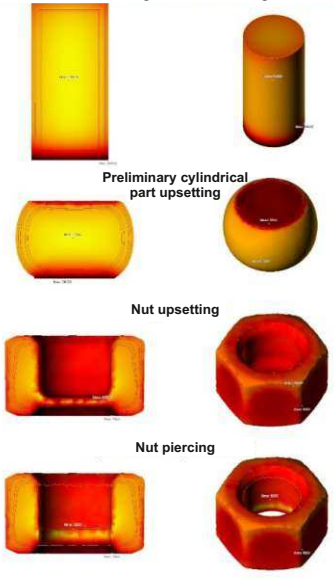


Engineering Department

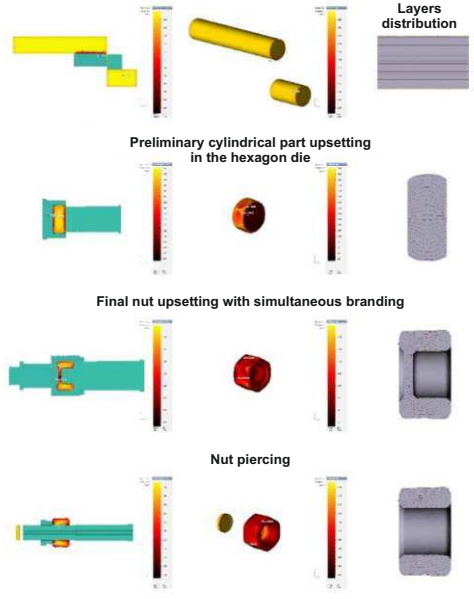


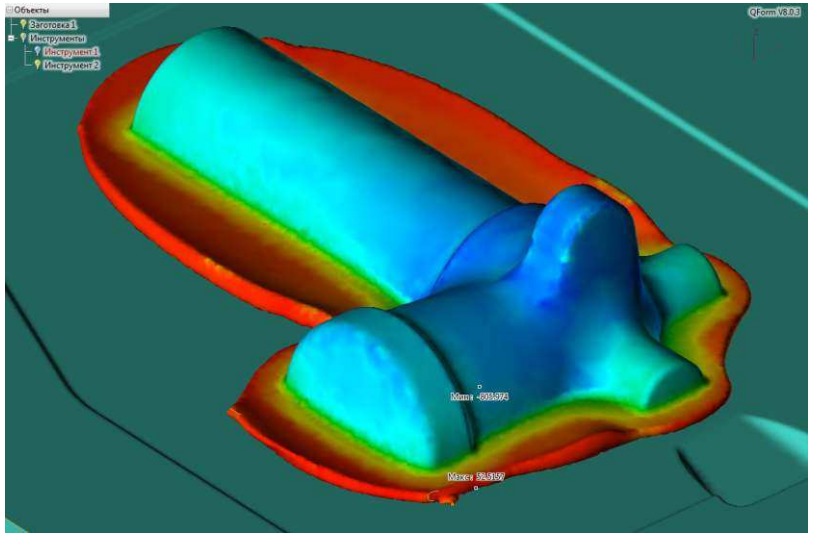


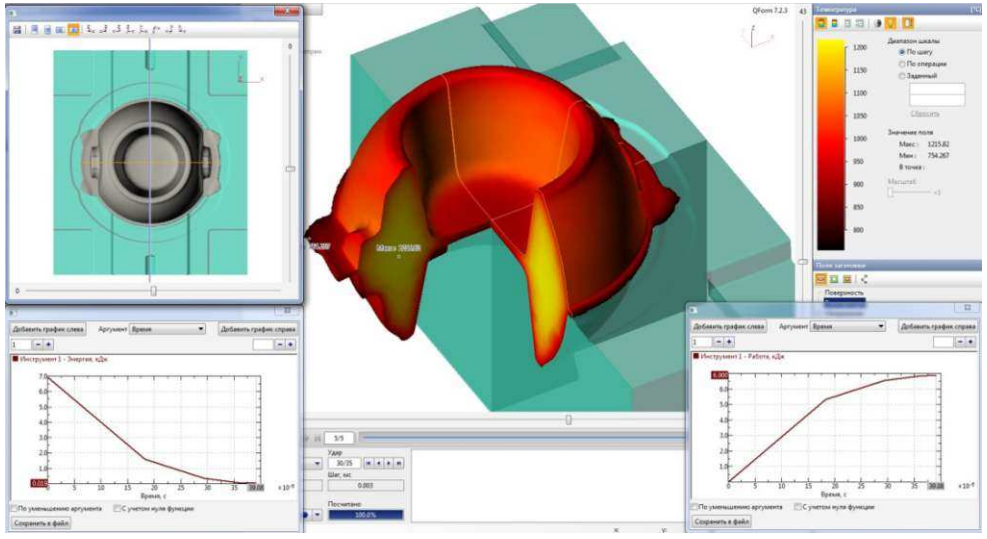
Forging simulation on AMP-20/30
Rolled metal heating and cut-to-length shearing



Forging simulation on AMP-20/30
Rolled metal heating and cut-to-length shearing





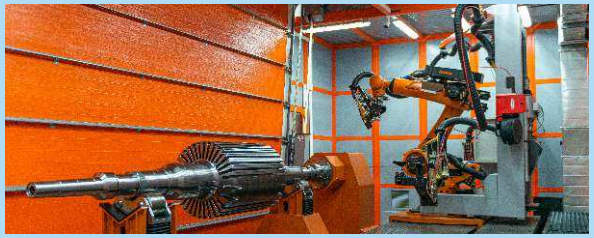


Equipment Maintenance, Diagnostics and Service Division

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

SIBUR
Maleic anhydride flaking and briquetting units preparation was performed, equipment installation will begin in January 2021

REM-Service
process equipment maintenance, spare parts and production accessories supply



Arctic LNG-2
SAREN - Novatek
extensive work on assembly and installation since 2021:
- vertical pumps: 80 sets
- fire-fighting pumps: 9 sets.

Production and preparation for works are in progress.

Mekhanika-R
erection supervision of pod propulsion units for marine vessels

ESPO (Transneft)
maintenance during the warranty period of operation of 69 pumping units (until 2024)

INK LLC
fuel gas package – installation and adjustment of the supplied equipment were completed, preparation for commissioning is in progress.

Services Division

LABORATORY INSPECTION

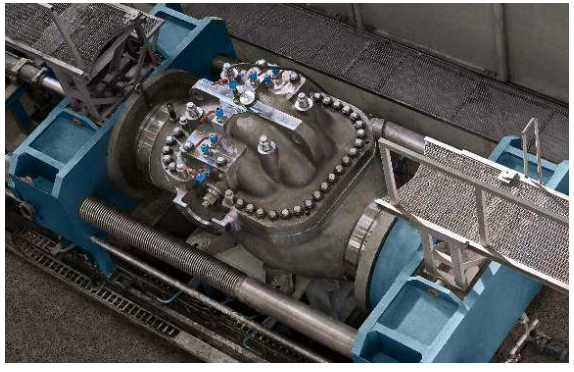
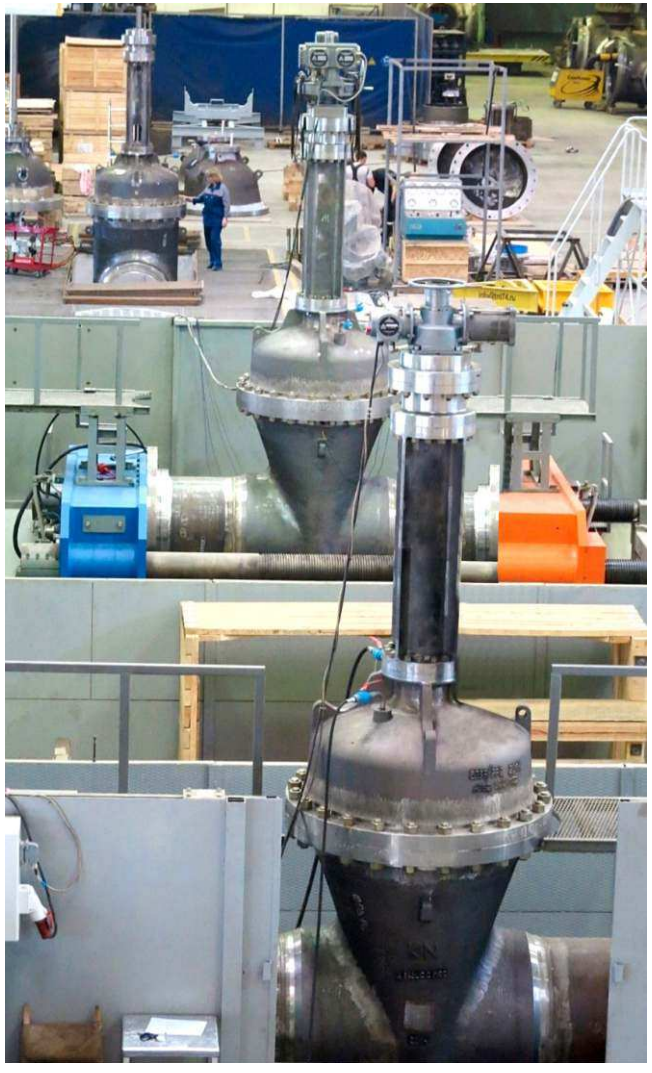
- Physical and mechanical tests
- Hardness test
- Metallography
- Chemical analysis
- Coating quality inspection
- Measurements

Non-destructive test: ● UT ● PT ● RT ● MT

- Metrological support

TESTS

- HYDRO-
- PNEUMO-
- CRYO-
- GRAVIMETRIC-
- SPECIAL-
- Fit-up assembly test

KONAR JSC Welding laboratory

Welding laboratory is a unique technological complex, which successfully achieves the following production goals:

- execution of test weld joints
- R&D, exercise of welding/weld deposition modes parameters
- welding and technological materials tests
- lifetime tests of wearing parts of welding and gas-plasma cutting equipment
- development of technical documentation
- training of personnel and welders qualification

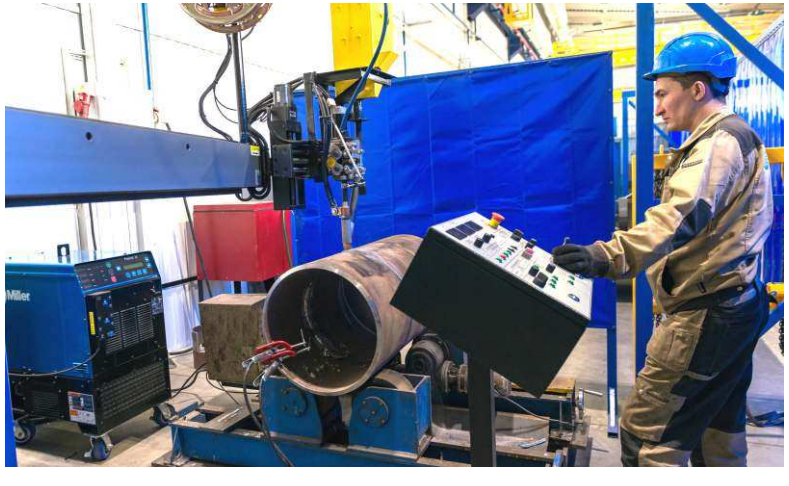
The following types of welding are available in the laboratory:

- manual arc covered-electrode welding
- manual and machine argon arc TIG - welding
- machine and robot-aided gas-shielded welding
- automated flux welding

The newest equipment of leading global manufacturers is located in the area of 200 m^2:

- welding machines Kemppi Fast Mig Pulse 350 with a feeding mechanism MXF 67
- welding machines Kemppi Master Tig MLS 2300 AC/DC and Kempi Master Tig MLS 3000 with a planetary feeding mechanism Profax Pro II
- robot-aided welding complex YASKAWA MOTOMAN MA 1900
- automated unit for flux welding Profax 2x2
- unit of heat treatment with high frequency current (HFC) Miller Pro Heat 35
- unit of portal plasma cutting SAEM with a water-filled table

In 2018 the equipment was certified in NAKS according to EN ISO and API standards. In 2019 production was certified by RMRS.



Control and measuring laboratory is equipped with CARL ZEISS (Germany)

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

Coordinate measuring machine Carl Zeiss Contura 9/12/8

Measurements range:
X = 900 mm I Y = 1200 mm I Z = 800 mm.
MPE length measurement tolerance = 1,8 µm.

Coordinate measuring machine Carl Zeiss MMZ M 30/45/20

Measurements range:
X = 3000 mm I Y = 4500 mm I Z = 2000 mm.
MPE length measurement tolerance = 3,3 µm.

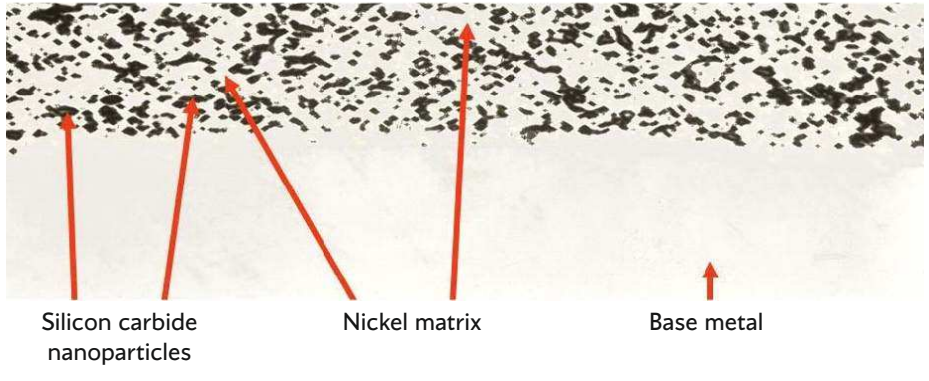
Nickel-plating line with silicon carbide nanoparticles

KONAR INDUSTRIAL GROUP — SINCE 1991 30 YEARS

Hard coating application based on the Japanese technology Kanigen.
Nickel-plating line capacity is 10 000 m^2 of coating per year (more than 3 500 items).

KONAR became the first Russian company, which started to use nickel-plating technology as a protective coating for products.
It helps to avoid formation of life-threatening hexavalent chromium in wastes.
By contrast to chromium, nickel is more ecological and recovered easily.

Silicon carbide nanoparticles penetrate into the metal structure forever and ensure extra hardness up to HV 1400.



JV KONAR-Cimolai LLC is a joint production with Cimolai S.p.A. for manufacturing of complex metal structures

A plant of complex metal structures, a joint Russian-Italian company. JV KONAR-Cimolai LLC produces non-standard and large metal structures for industrial and civil construction.

Shareholders: KONAR JSC (Russia, Chelyabinsk), Cimolai S.p.A. (Italy).
Total area — 33 000 m^2.
Total area of the production building — 24 000 m^2 with the prospect of expanding up to 50 000 m^2
Number of employees — 500 people.
Production capacity — 2 000 tons per month.

Completed projects of JV KONAR-Cimolai LLC for engineering and fabrication of metal structures

Volgograd Arena stadium for 2018 World Cup, Volgograd

Nizhniy Novgorod stadium for 2018 World Cup, Nizhniy Novgorod

The tallest building in Europe – **business complex Lakhta Center** – 462 m, 86 floors, St. Petersburg

Implemented projects of JV KONAR-Cimolai LLC for engineering and production of metal structures

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

Construction of Kola Yard

Construction of the sports-and-concert complex in Saint Petersburg

Energy-Constructional Structures Plant JSC (ESCON JSC) – fabrication of metal structures for power engineering, Yuzhnouralsk

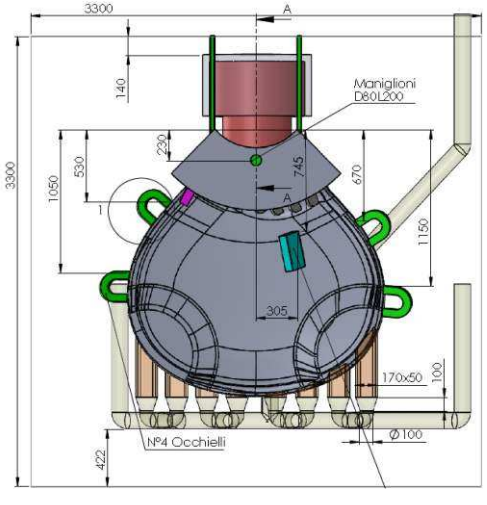
Energy-Constructional Structures Plant JSC was founded in 2012 in Yuzhnouralsk, Chelyabinsk region. It produces large metal structures for power engineering, transportation, infrastructure industries.

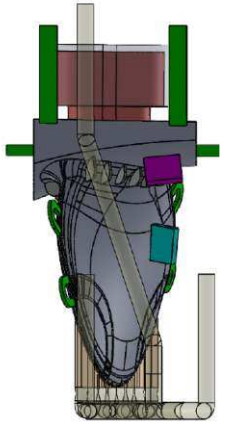
The hot-dip galvanizing line (KOERNER, Austria) with the largest zinc bath in Russia is able to produce automatically galvanized products up to 40 000 tons per year and provides ultimate quality of zinc coating even after the first dip.

Energy-Constructional Structures Plant JSC (ESCON JSC), Yuzhnouralsk

Experience and competences of KONAR in localization of production of equipment for shipbuilding

For purposes of production localization in the territory of the Russian Federation, KONAR JSC purchased a multifunctional machining center Waldrich Coburg Taurus 3000 AT 2,5x5 m.





Experience and competences of KONAR in localization of production of equipment for shipbuilding

KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

Experience and competencies of KONAR Group in localizing production of equipment for shipbuilding

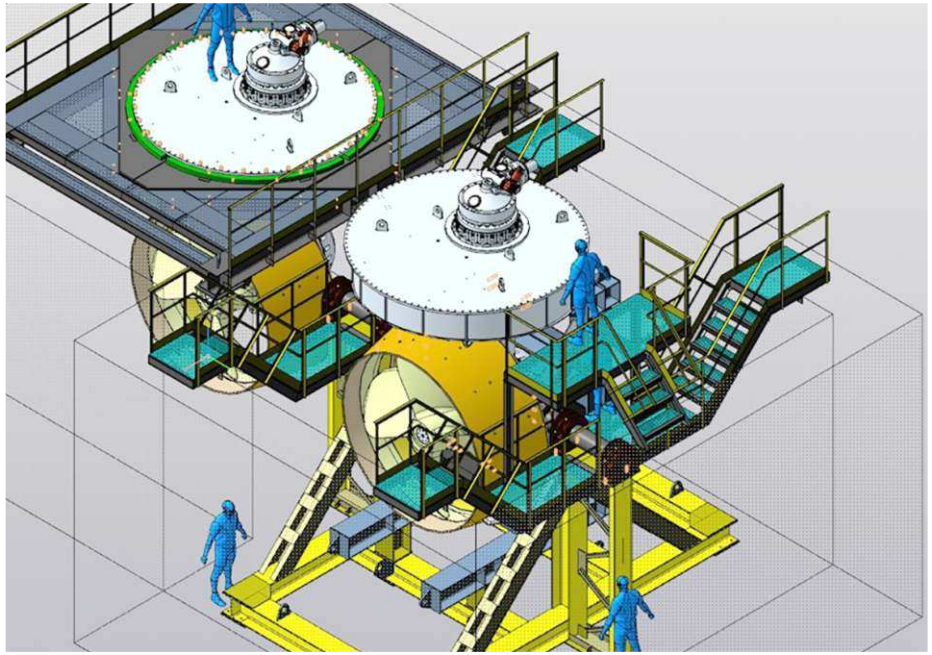
KONAR 30 YEARS
INDUSTRIAL GROUP — SINCE 1991

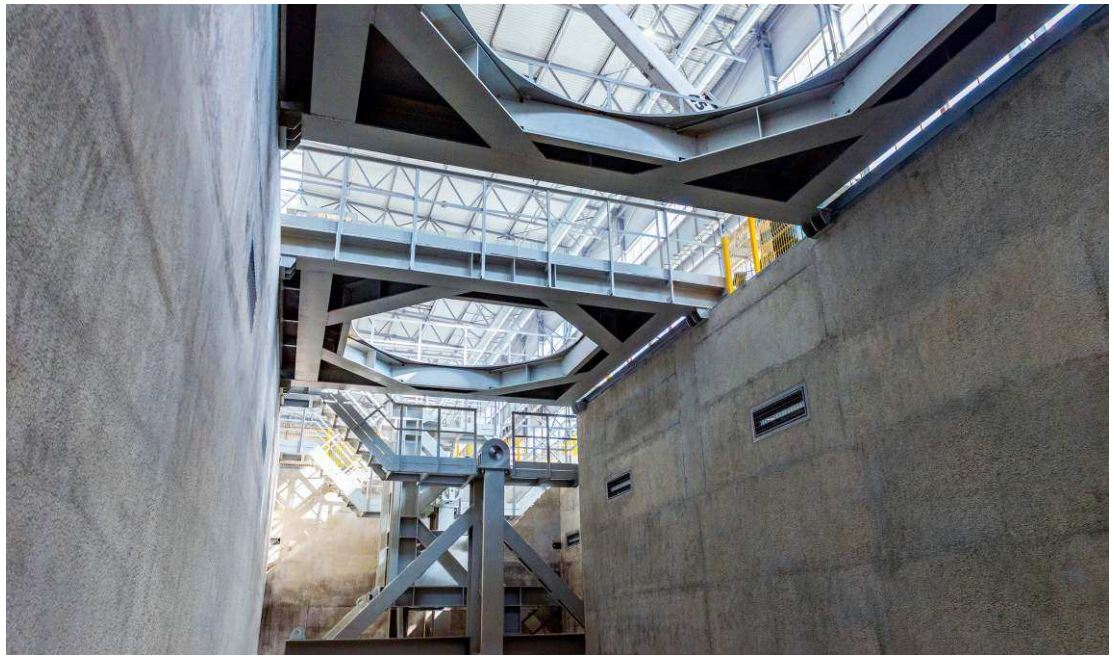
LOCALIZATION OF COMPONENTS FOR THE POD PROPULSION unit Seajet (designed by General Electric), Azipod (designed by ABB)

100%

localization of propellers for Arc7 LNG carriers

Bench for pod propulsion unit assembly and tests





Experience in the supply of 2.5 MW pod propulsion units for Yaroslavl Shipyard
for the tug pr.2347 in the amount of 6 pcs.

Localization of production of blades for Arc7 gas carriers

Production of fasteners, pipeline fittings and valves

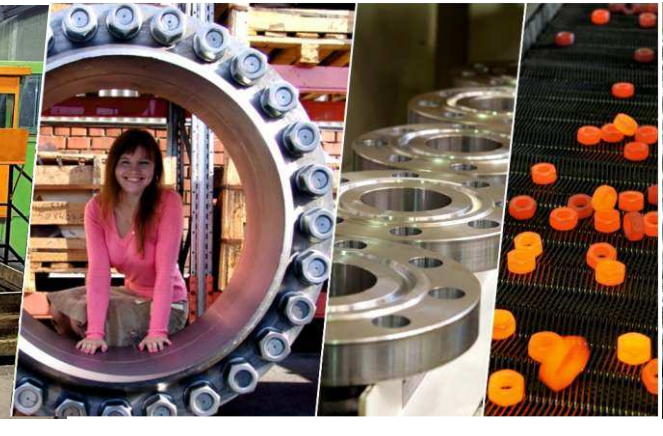
Flanges
Weld neck flanges GOST R 54432-2011 (GOST 12821-80):
DN 16 - 1200, PN 1,6 - 25,0 MPa
Plate flanges GOST R 54432-2011 (GOST 12820-80): DN 15 - 1400, PN 0,1 - 2,5 MPa
Wellhead equipment flanges GOST 28919-91: DN 50 - 680, PN 1,4 - 6,3 MPa
Flanges for vessels and apparatus GOST 28759-91: DN 400 - 1400, PN 1,0 - 6,3 MPa
Steel flanges according to ASME (ANSI) B16.5 and DIN-EN 1092-1
Flanges according to other standards and client's drawings

Flange fasteners
Studs and nuts: M12 – M90

Plugs
Flange, spectacle and paddle plugs

Flange gaskets
Metal, flexible

Spindle pair
For wedge valves: DN 15 - 500, PN 1,6 - 25,0 MPa
For gate valves: DN 150 - 1200, PN 1,6 - 8,0 MPa



Hot forming presses Hatebur AMP 30 S production line

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Possible industries for HATEBUR products:

- Mechanical engineering: turbines and pumps components; pipeline valves; bearings
- Oil and gas industry
- Assembly of critical metal structures: infrastructure facilities; constructions, bridges
- Railway industry
- Automobile and tractor construction

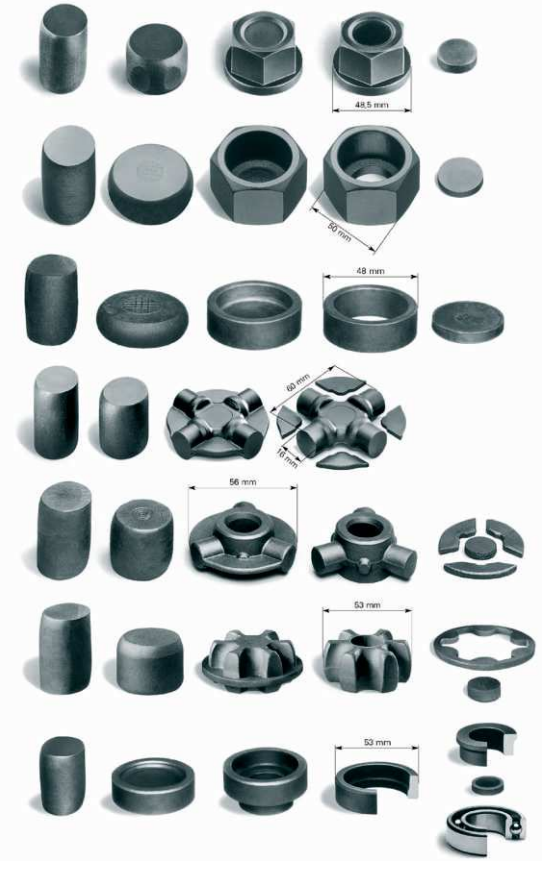
Output capacity of the entire area:
up to **7 nuts** per second

HATEBUR technology.
Hot forming

M12-M36 nuts are produced by KONAR by the hot upsetting method on the hot forming presses Hatebur (AMP20, AMP30), which gives an improved blank metal structure, thereby increasing mechanical properties and reliability.

Production capacities of KONAR allow to produce up to 450 t of nuts per month.

FORMING TECHNOLOGY (SOME BLANKS)



BLANKS MATERIAL

Round bars::
diameter
from 12 to 36 mm,
length 6000 mm

HIGH-GRADE CARBON STEELS:

- 25
- 35

LOW-ALLOY STEELS (ALLOYS):

- 35X
- 40X
- 09Г2С
- 30XMA
- 20XH3A
- 38XM

HIGH-ALLOY HEAT-RESISTANT STEELS (ALLOYS):

- 20X13
- 12X18H10T
- 14X17H2
- 10X17H13M2T
- 45X14H14B2M

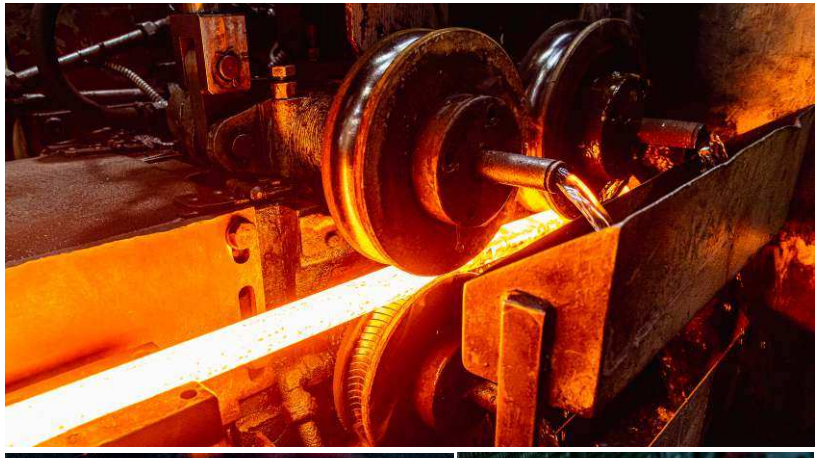
FORGING SIMULATION

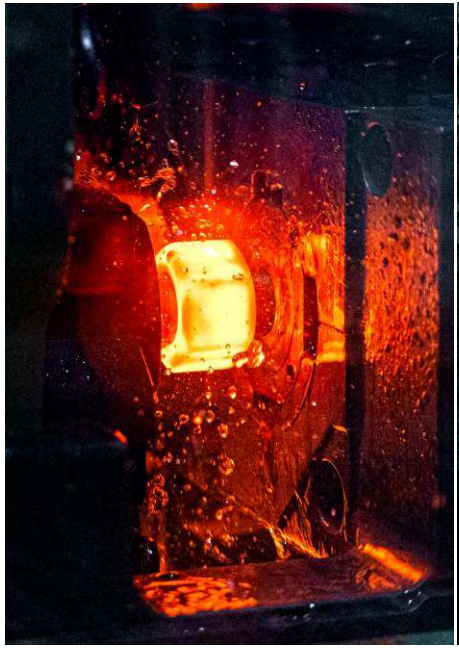
Rolled metal heating and cut-to-length shearing

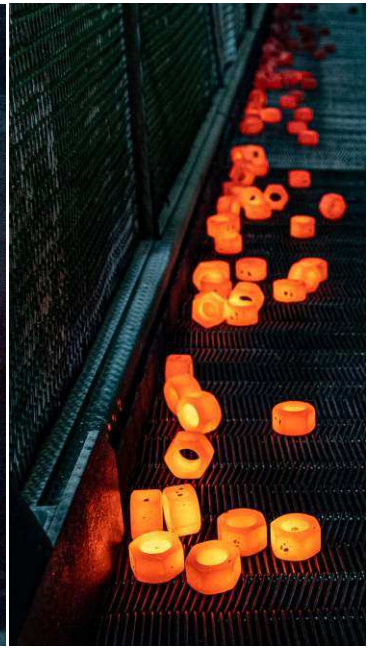
Preliminary cylindrical part upsetting in the hexagon die

Final nut upsetting with simultaneous branding

Nut piercing







6 mln pieces
monthly products output

Modular equipment for oil and gas

Coalescer filter

Isolation and distribution gas unit

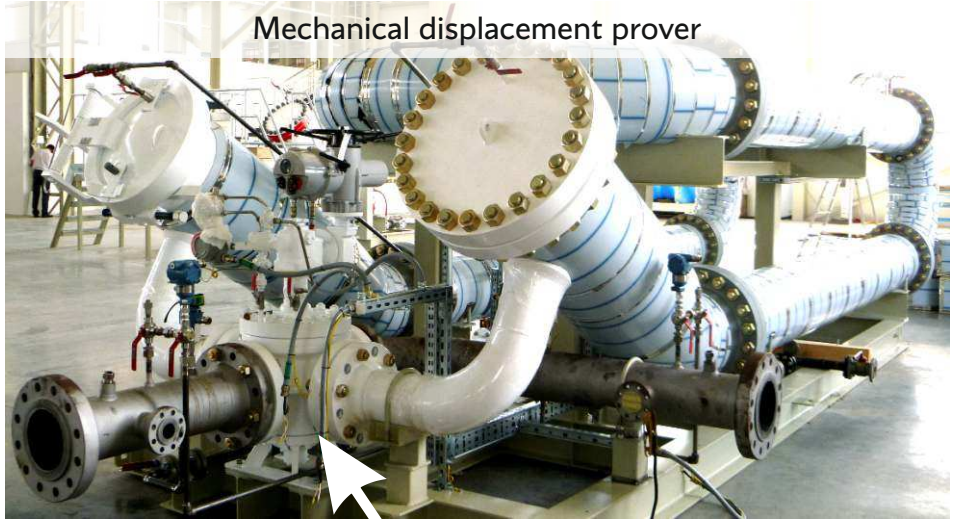
Lube oil systems

Receiver

Import substitution of Cameron (USA) gate valves for CQCS

Crude quality control system (CQCS)

Mechanical displacement prover



Welded gate valve

4-ways ball valve

Pumping units production

Transneft Oil Pumps JSC is a plant for localized manufacturing of mainline and booster pumps. Resident of Stankomash Industrial Park and a strategic partner of KONAR Industrial Group.

Termomeccanica RUS is a joint venture of Termomeccanica S.p.A. (Italy) and KONAR JSC, an official representative of Termomeccanica S.p.A. in the territory of the Russian Federation.

Transneft Oil Pumps JSC – a test center for mainline and booster pumping units

Characteristics:

1. Max. power of tested equipment – up to 12 MW
2. Max. capacity of tested equipment – up to 16000 m^3/h
3. Max. pressure – up to 7 MPa (planned up to 32.0 MPa for high-head pumps)
4. Testing tank volume and depth: 2615 m^3 and 10 m

Number of testing slots:

- for vertical pumps: 3
- for horizontal pumps: 4

Equipment measured parameters:

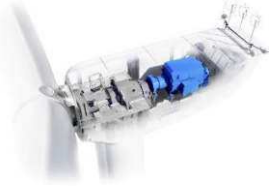
- flow rate of pumped fluid
- frequency of rotation
- suction pressure
- discharge pressure
- torque capacity
- electric power consumption
- voltage, current, frequency
- temperature of pumped fluid, pump components, electric motor components
- noise, vibration, weight

Russian Electric Motors JSC — plant for localized production of electric motors and generators

1 stage: localized production of a line of modern electric motors for the needs of pumping stations inside the Russian system of main oil lines.

2 stage: start-up of production of generators and components for self-sufficient wind generators.

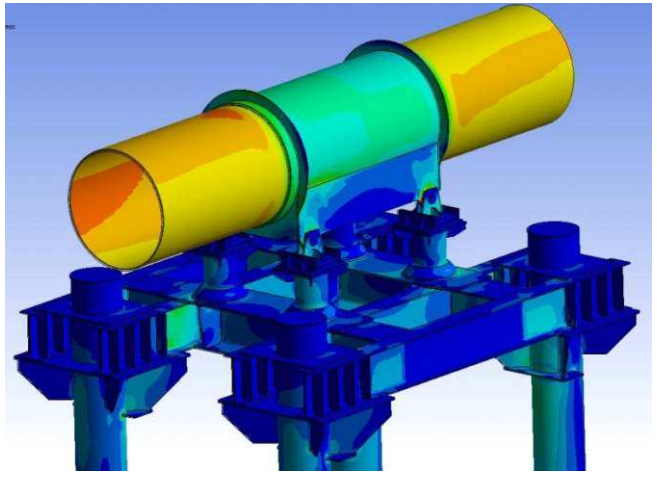
3 stage: start-up of production of electric motors for icebreaking class vessels.



Supports of main oil line Zapolarye-Purpe of Transneft PJSC

Total length of Zapolarye-Purpe is 488 km
Length of the aboveground section is 320 km

- unique R&D of KONAR JSC Engineering Center for Transneft PJSC
- 19 428 supports were produced in 1.5 years of project implementation
- R&D on the technology of ground thermal stabilization was conducted



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