



VOLGASTALPROEKT

INDUSTRIAL
PRODUCTION OF
METALLURGICAL
BLANK
PRODUCTS



About us

LLC «**VolgaStalProekt**» is a modern fast-growth metals company founded in 2005. Our core business is manufacture of semifinished metallurgical products widely used in machine building including nuclear power engineering, petrochemical industry, shipbuilding, transport machine building, manufacture of lifting equipment, mining equipment.

The company activity related to manufacture of equipment for nuclear power generating facilities is regulated by requirements of and conducted on the basis of a license issued by the Federal Environmental, Industrial and Nuclear Supervision Service.

The quality management system has been certified as compliant with the requirements of the international standard ISO 9001-2011 and GOST PB 0015-002-2012.

We deliver products certified as compliant with the requirements of GOST and other regulatory documentation. We can deliver products with quality plans accepted by a Certifying Authority, Russian Maritime and River Registers, Military Representative Office of Ministry of Defense of the Russian Federation.

Our advantages are a modern approach to resource management, powerful manufacturing capabilities, implementation of advanced industrial management technologies, cost optimization, flexible pricing pattern.

The experience to date, our own present-day production, individual approach to each partner make LLC «**VolgaStalProekt**» a much-in-demand manufacturer in the metallurgic market of Russia and neighboring CIS countries.

Key Business Lines of the Company

- Making forgings by free forging on presses and hammers.
- Making stampings by hot die forging on hammers and presses.
- Making castings by various casting methods.
- Rendering services of heat treatment of semifinished metallurgical products accompanied by certification as compliant with requirements of the standards applied in various branches of machine building (GOSTs, Industrial Standards (OST), Standards by the Central Design Bureau of Armature Engineering etc.) applying various methods of destructive and non-destructive tests.
- Rendering services of comprehensive study of quality by destructive and non-destructive tests aimed at checking compliance with regulatory documentation in order to define the character and causes of defects induced at various manufacturing stages and providing recommendations for their elimination.
- Pre-machining and final machining of semifinished products.
- Cutting of semifinished products.



Nonferrous Casting

Foundry engineering focuses on making castings of aluminum-base and copper-base alloys intended for various branches of machine building.

Modern production machinery is provided for the manufacturing facilities. It is made by well-known Russian manufacturers and global leaders in this sphere, such as:

- **OMEGA** (Great Britain) — automated molding line FastLoop, mixing devices, vibrating tables, tilting cradle;
- **GUT** (Germany) — filling and cooling conveyor, knock-out grid, regeneration equipment;
- **LAC** (Czech Republic) — gas melting furnaces with the function of automated melting;
- **GOSTOLTSTdd** (Slovenia) — shot-blast machine.



Molding methods used to manufacture castings:

- temporary nobake casting («furan process»);
- centrifugal casting;
- permanent mold casting.

Alloys used to make castings:

- aluminum-base alloys as per GOST 1583-93;
- copper-base alloys (bronze, brass) as per GOST 613-79, GOST 493-54, GOST 17711-93.

Dimensions and Weights of Castings:

Maximum weight of castings manufactured by nobake casting:

- aluminum-base alloys — 500 kg.
- copper-base alloys — 800 kg.

Maximum dimensions of castings manufactured by nobake casting — 1,500x1,200x600 (height) mm.

Maximum weight of castings of aluminum-base alloys made by permanent mold casting — 300 kg.

Maximum weight of castings made by centrifugal casting — 800 kg.

Dimensions of castings made on a centrifugal machine:

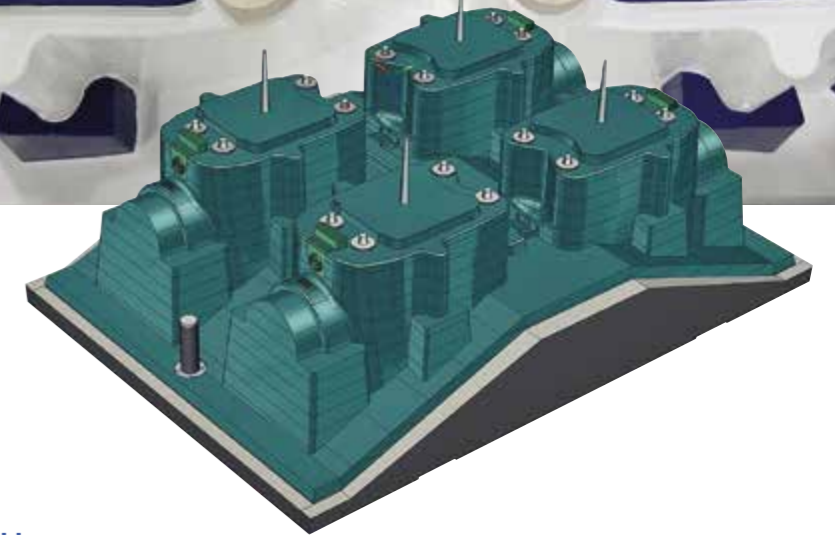
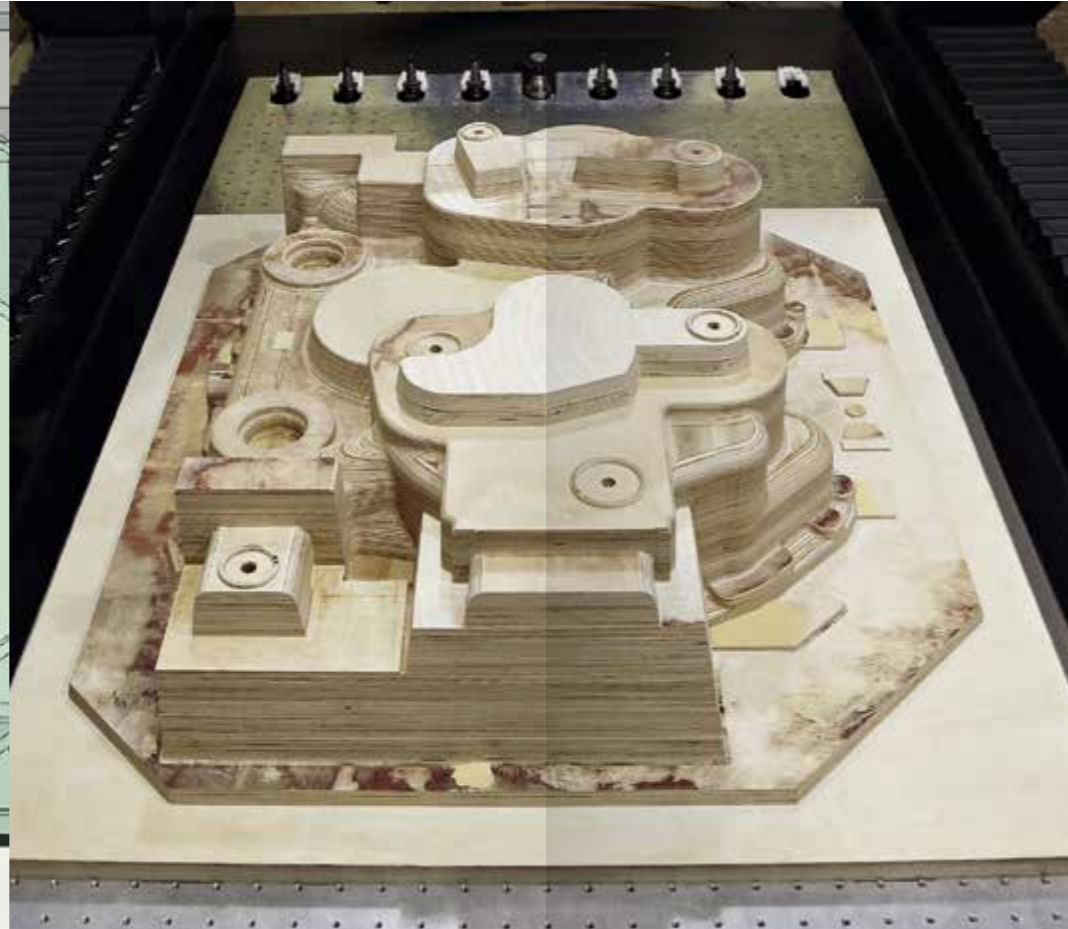
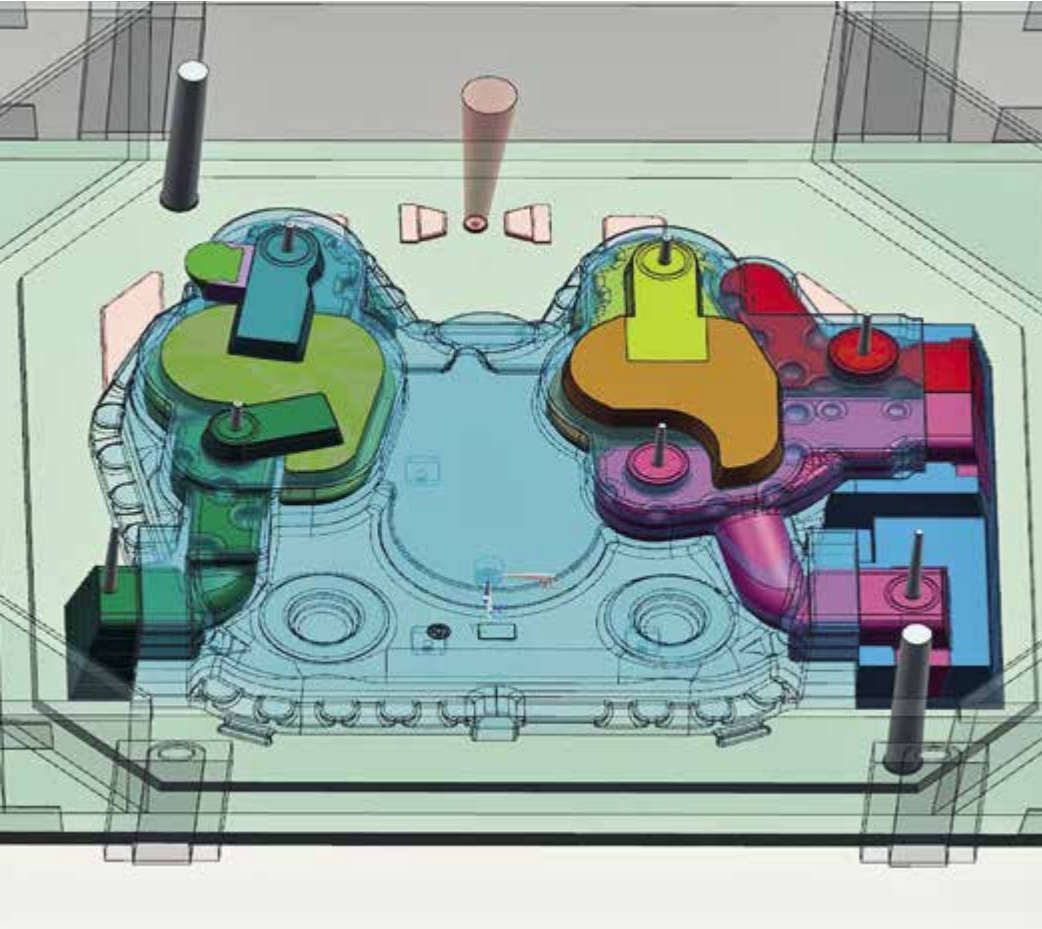
- Outer diameter — 400~1,000 mm.
- Height — 35~500 mm

An inherent part of the castings manufacturing procedure using aluminum-base alloys is liquid alloy degassing in order to minimize the adverse effect of hydrogen dissolved in the liquid alloy which causes pouring defects in castings, that is gas unsoundness.

For this purpose a degassing unit **FDU-10** (Germany) treating the liquid-alloy in a ladle is used in the manufacturing process. In order to assess the degassing effectiveness the alloy density index is defined using aluminum-base alloys' testing devices **GASTECPRO 2.0** and alloy density defining devices **DENSITECBC-1500C+AI-0011 DEVICE** (Italy).

Our laboratory is a part of the manufacturing facilities. It is provided with modern equipment and appliances which examine the chemical composition of alloys and the quality of molding sand and core sand.

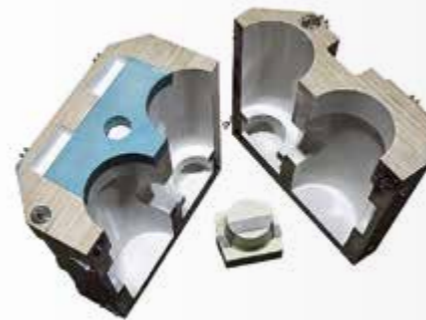




Modeling Workshop

A modeling workshop is a part of facilities of LLC «**VolgaStalProekt**». It is provided with modern multi-purpose woodwork machines and computer controlled machines which manufacture pattern equipment of high complexity and quality using various materials (modelling plastic, composite board, hard wood, aluminium alloys etc.).

While developing design-engineering documentation we widely and successfully use software CAD/CAM: NX, PowerMILLPro as well as a modern foundry process simulation program LVMFlow.



Our company also renders services of making drawings and 3D models:

- development of surface and solid models using the customer's drafts;
- development of surface and solid models based on 3DS models;
- development of surface and solid models using drawings;
- introducing changes in castings configuration after transformation of surface and solid models;
- development of drawings on the basis of surface and solid models;
- making assemblages and combining individual models into one STL model.
- development of surface and solid models based on point cloud or STL model;





Stampings. Forging

One of the areas of business of LLC «VolgaStalProekt» is manufacture of forged blanks (press and hammer forgings, hot stampings) and products made of them for various branches of machine building: nuclear power engineering and power engineering, petrochemical industry, ship-building and other industries.



Type of blank or product	Dimensions, weight	
	Machine processed	Not machine processed
Rolled rings	$D_{\text{outer}} \leq 2,400 \text{ mm}$ $H \leq 600 \text{ mm}$ Weight up to 4,000 kg	$D_{\text{outer}} \leq 4,000 \text{ mm}$ $H \leq 700 \text{ mm}$ Weight up to 8,000 kg
Smooth and stepped spindles	$D_{\text{outer}} \leq 750 \text{ mm}$ $L \leq 6,500 \text{ mm}$ Weight up to 5,000 kg	$D_{\text{outer}} \leq 800 \text{ mm}$ $L \leq 7,500 \text{ mm}$ Weight up to 8,000 kg
Holed cylinders	$D_{\text{outer}} \leq 700 \text{ mm}$ $D_{\text{inner}} \leq 600 \text{ mm}$ $L \leq 2,000 \text{ mm}$ Weight up to 5,000 kg	$D_{\text{outer}} \leq 850 \text{ mm}$ $D_{\text{inner}} \leq 600 \text{ mm}$ $L \leq 5,000 \text{ mm}$ Weight up to 7,500 kg
Discs with and without holes	$D_{\text{outer}} \leq 2,400 \text{ mm}$ $H \leq 500 \text{ mm}$ Weight up to 5,000 kg	$D_{\text{outer}} \leq 2,500 \text{ mm}$ $100 \leq H \leq 500 \text{ mm}$ Weight up to 7,500 kg
Plates, blocks with and without holes	Max: 800×1000×2000 mm Weight up to 8,000 kg	Max: 800×1200×4000 mm Weight up to 10,000 kg

Forgings

Forgings are made by free forging on forging presses and hammers followed by heat treatment and mechanical processing.

The forgings are delivered certified as compliant with GOST 8479-70, GOST 25054-81, Industrial Standard 108.109.01-92, Industrial Standard 108.030.113-87, Standard by the Central Design Bureau of Armature Engineering, Industrial Standard 5P.9125-84 and other standards and terms.



Stampings are manufactured by hot die forging using hammers which falling parts weigh 1-10 tons as well as using crank-type hot die-forging presses which power amounts to 1,600 tnf; 2,500 tnf; 4,000 tnf with heat treatment (hardening (austenitization), martempering, normalizing, tempering, annealing etc.) and with certification as compliant with the requirements of various standards used in Russian machine building (GOST 8479-70, GOST 25054-81, Standard by the Central Design Bureau of Armature Engineering, Industrial Standard 108.030.113-87, Industrial Standard 5P.9125-84 etc.) using destructive and non-destructive testing methods in certified laboratories (ultrasonic testing, mechanical tests, inter-crystalline corrosion resistance tests, macrostructure and microstructure tests).

We deliver forgings accompanied by Quality Plans accepted by JSC All-Russian Production Assembly Zarubezhatomenergostroy (JSC «VPO «ZAES») and Russian River Register as well as accepted by the Defense Ministry using destructive and non-destructive test methods in certified laboratories (ultrasonic testing, mechanical tests, inter-crystalline corrosion resistance tests, macrostructure and microstructure tests), with standardized value of the grain size, ferritic phase and non-metallic inclusions.

Used Materials:

- high-grade and alloy structural steel;
- low alloy and alloyed structural steel;
- heat resistant steel;
- spring structural steel;
- tool steel;
- copper-base, aluminium-base and titanium-base alloys.



Heat Treatment

The Company renders services of 3D heat treatment of blanks and assemblies of over 100 various steel grades and alloys.

Applied types of heat treatment:

- negative hardening;
- normalizing;
- austenitization;
- (air, water, oil) quenching;
- tempering;
- stress-relief tempering of welded assemblies.

Regulatory documentation used for appraisal of quality of heat treatment:

- GOST 25054-81;
- GOST 8479-70;
- Industrial Standard 108-030.113-87;
- Industrial Standard 9529-72;
- Industrial Standard 3-1686-80;
- Industrial Standard 108.109.01-92;
- Industrial Standard 108-030.113-87;
- Standards by the Central Design Bureau of Armature Engineering etc.

Performance Specifications of Manufacturing Machinery

- Maximum dimensions of the furnace proper — 3,000(L)×2,500(W)×1,500(H);
- Maximum heating temperature — 1,150 °C;
- Performance range — 310–1,150 °C;
- Accuracy of temperature distribution in the furnace body — ±5 °C;
- Maximum weight of heat treatment load — 10,0 tons;
- Quenching compounds — water, industrial oil;
- Dimensions of the work space of the hardening tanks — 4,000 (L)×3,000(W)×2,500(H);
- Volume of hardening compound in tanks — 24 m³;
- The hardening tanks have a system of control and registration of temperature of the hardening compound as well as a system of cooling rate registration using an impeller.

The heat treatment capability may be improved for specific targets.



Mechanical Processing

Machining workshop of LLC «VolgaStalProekt» is equipped with modern metal-cutting machine tools including programmed ones and machining centre type machines which are constantly renewed and complemented.



We use tools made by leading global manufactures which provide high productivity and sustained quality of products.



The machines are capable of roughing-out of large workpieces as well as finish machining of precision components:

- turning of long workpieces with dimensions up to: $\varnothing 600 \times 5,000$ mm, $\varnothing 300 \times 8,000$ mm, including CNC turning up to $\varnothing 600 \times 3,000$ mm.
- turning of disc-type workpieces with dimensions up to $\varnothing 2,500 \times 1,000$ mm.
- CNC turning of mid-size workpieces with dimensions up to $\varnothing 200 \times 1,000$ mm.
- peripheral milling of prismatic parts of the dimensions up to $900 \times 900 \times 3,000$ mm.
- machining of workpieces up to $1,200 \times 700 \times 700$ mm on machining centers.



Services of the Metal Research Laboratory

In view of increase of manufacture of metallurgical blank products for essential components used in products of various branches of machine building which require a comprehensive research of quality of metals the Company has founded a Metal Research Laboratory.



The staff of the laboratory consists of highly qualified specialists with professional higher education and science degrees and with years of hands-on experience in research laboratories of large industrial enterprises.

The laboratory has necessary regulatory documentation, modern testing equipment, devices and measuring instruments which help us to conduct comprehensive studies of the quality of metals used to manufacture blanks.

Services of the Metal Research Laboratory

- Macrographic examination, fracture tests, study of sulphur partition by Baumann's method as per GOST 10243-75 and other regulatory documentation.
 - flexure test as per GOST 14019-2003.
 - hardness determination using Brinell hardness test, Rockwell hardness test, Vickers hardness test as per GOST 9012-59, GOST 9013-59.
- Micrographic examination:
 - grain-size testing as per 5639-82;
 - defining of metal nonmetallic impurity rating as per GOST 1778-70;
 - ferrite content determination in products made of corrosion-resistant chrome-nickel steel of austenite class by magnetic method as per Interstate Standards Recommendations 2730.300.08-2003, by metallography as per GOST 11878-66.
- Mechanical Tests at Low, Room and High Temperature:
 - tensile test (defining the yield point, tensile strength, percentage of elongation, contraction ratio) at room temperature and high temperature as per GOST 1497-84, GOST 9651-84;
 - impact-bending test (defining impact energy, impact strength) in the range of temperatures from — 80 °C to 100 °C as per GOST 9454-78;
 - critical brittle point determination in the range of temperatures from — 80 °C to 100 °C as per Rules and Standards of Nuclear-Power Engineering G-7-002-86;
- Testing corrosion-resistant steel and alloys for inter-crystalline corrosion resistance as per GOST 6032-2003.
- Chemical analysis of composition of steel and alloys by spectral method as per GOST 18895-97.
- Measuring of magnetic characteristics of steel and alloys.
- Ultrasonic flaw detection and magnetic particle flaw detection, dye penetrant inspection types.
- Comprehensive research of quality of materials of semifinished metallurgical products checking correspondence to requirements of regulatory documentation, in order to define the character and reasons of defects in the blanks, products destruction at various stages of manufacture, providing of recommendations for elimination of defects.

Certificates



Certificate of Conformity



License issued by the Federal Environmental, Industrial and Nuclear Supervision Service



Certificate of Right issued by the Russian River Register



Recognition Certificate of Testing Laboratory



Certificate of Status of Measurements in the Laboratory



Governor's Diploma «For High Quality and Competitiveness»



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