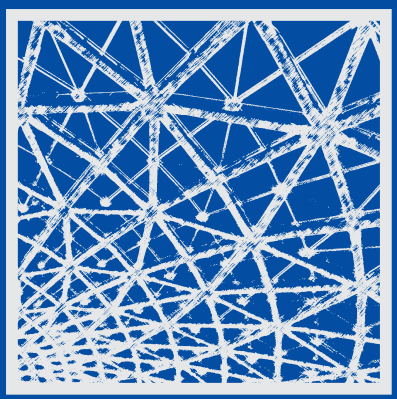
ENERGOMASH

JSC ENERGOMASH (BELGOROD)-BZEM

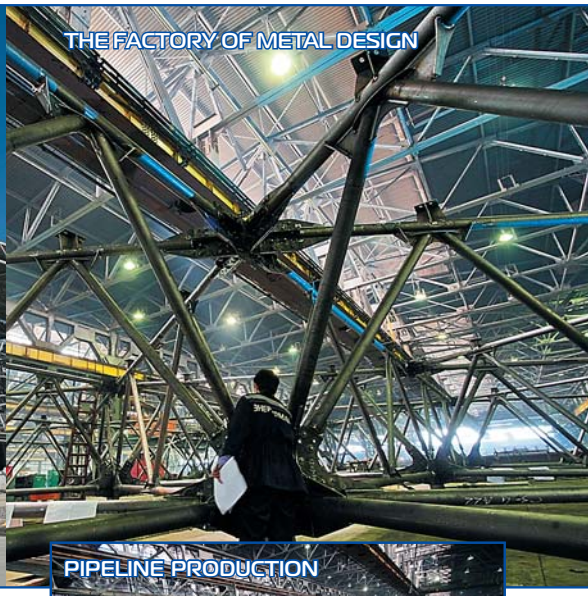


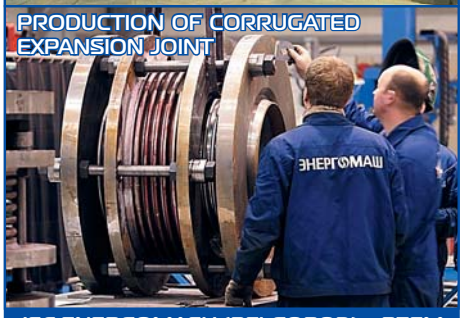
THE FACTORY OF METAL DESIGN

2013

ENERGOMASH

JSC Energomash (Belgorod)-BZEM





JSC ENERGOMASH (BELGOROD) – BZEM INDUSTRY

You hold in your hands a new prospect "The Factory of Metal Designs" of the Group of companies JSC Energomash (Belgorod) – BZEM. One more stage of our history is ended. And in our publication we present the most significant construction projects during the last time in which the company had taken a direct part.

JSC Energomash (Belgorod) – BZEM was created on the basis of two Belgorod large –scale enterprises – factory of metal constructions and power machine building plant. The company is a manufacturer and a supplier of the wide range of production for industrial and civil construction, thermal and nuclear power, oil and gas complex, metallurgy.

JSC Energomash (Belgorod) – BZEM consists of 5 productions of a various profile and direction and more than 3000 staff.


ЭНЕРГОМАШ
KC-55727-1
KANISKA

The production of metal constructions JSC Energomash (Belgorod) – BZEM is one of the leading factory-manufacturer of steel structures of industrial and civil constructions in Russia.

The main products are:

- metal structures of building frame;
- metal structures of bridges, overpasses, trestles;
- power transmission line support, antenna mast structure;
- unique constructions from the pipe;
- non-standard equipment.

We provide services of hot-dip galvanizing for outside organizations.

Our advantages are:

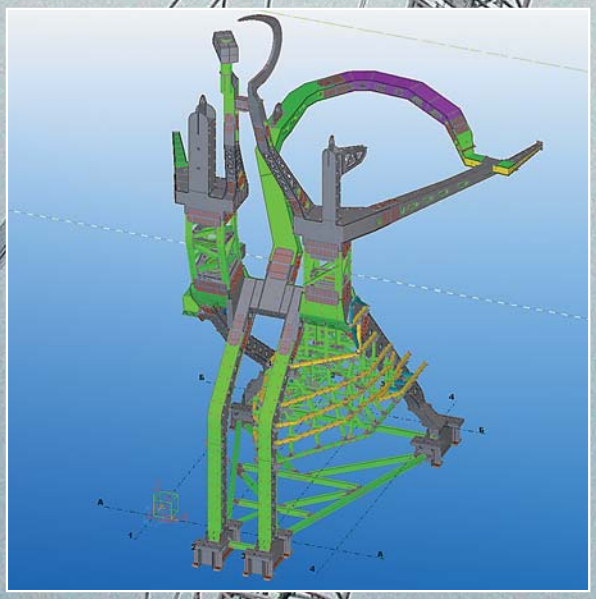
- 40-years experience in the construction market in the area of metal structures;
- the latest developments in structural design;
- the operating international system of quality management ISO 9001-2008.

Addressing to us, you can get a professional and complex approach to solve your problems such as:

- developments of drawings KM, KMD in the programs 3D;
- manufacturing details and shells from the whole kinds of metal-roll (sheet, section, pipe) with split-hair accuracy;
- assemblage and weld of metal structures by the certified welders;
- necessary controlled assembly;
- protection of metal structures with the help of any paint materials or hot galvanization;
- delivery of constructions, including oversized constructions, with motor or rail transports.

No matter how is complicated and unique your own project, JSC Energomash (Belgorod) – BZEM is the company which can realize it.

Moscow
Metal structures of the monument frame "Worker and collective farmer"
2009 Frame weight – 120 tons.

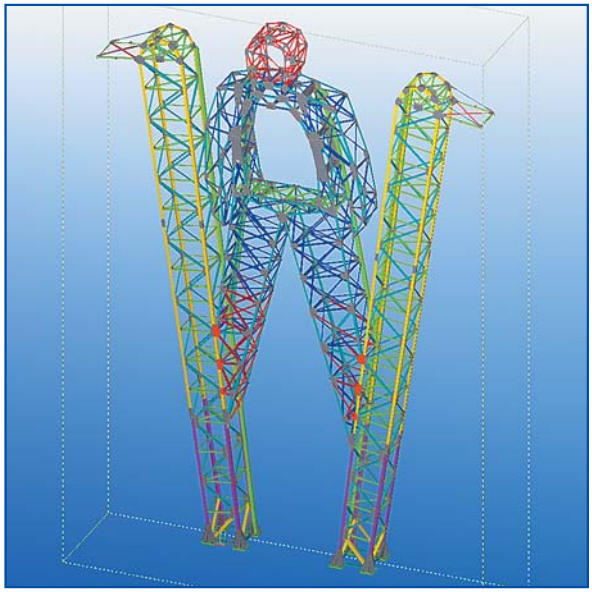


The modern engineering is for simplification of design process

"Department of metal structures" of the engineering department JSC Energomash (Belgorod) – BZEM makes the projects KM of buildings and constructions of I and II level complexity. It is also makes drawings KMD. A package of design documentation on base of the system of three-dimensional design guarantees convergence of elements on 3D assembling despite of complexity of skeletons geometry.

CAD-systems of the highest level of 3D-simulation Tekla Structures, Unigraphics NX4 are used in design of spatial constructions.

The internal structure of programs allows to get the necessary technical documents on base of three-dimensional model such as: specification of metal-roll, register of joint welds, register of adjusting hardware, list of deliverable assemblies and others. Work on the development of design and engineering documentation is conducted in a same process environment on the basis of solid design model. This is incontestable preference for us and it helps to reduce the period of engineering preparation of manufacture.



The design group "Department of metal structures" has their own developments and "know how" concerning tapping points of pipework. We use the progressive method of a single-stage designing in our work.

JSC Energomash (Belgorod) – BZEM is the member of SRO "The First National Organization of Builders" (Certificate from 21.09.2011) and SRO "The National Organization of Designers" (Certificate from 08.09.2011).

НЕКОММЕРЧЕСКОЕ ПАРТНЕРСТВО
«Национальная организация проектировщиков»

СВИДЕТЕЛЬСТВО

№ 0148.03-2010-3123193950-П-050

Выдано члену саморегулируемой организации:

Закрытому акционерному обществу
«Энергомаш (Белгород) - БЭМ»

Председатель Совета А.А. Ливадус

№ 0000148

Cable-way over the Volga, Nizhni Novgorod – Pinery
Metal structures of 10 pipe piers with the total weight 612 tones. 2 piers have the height 82 meters.
Manufacture – from August to December 2009, Assembly – from June to September 2010.

The official opening of cable-way was in 2012.

Feasibility of equipment

The technological infrastructure of the plant plays an important role in the manufacture process of complexity steel constructions. The present level of mechanical equipment JSC Energomash (Belgorod) – BZEM meets the highest requirements. Manufacturing operations are made on the automatic equipment of foreign manufacturers such as: "Messer" (Germany), "Ficep", "Boss" (Italy), "Lincoln Electric" (USA) and others.

We have the whole necessary machines with the large-scale for processing of sheet, profile and pipe.

The whole metal-roll is shot blasted in the spring-device camera and the follow-up correction before production start-up.

Manufacturing of details from metal-roll sheet is made on equipment with CNC with gas and plasma cutting.

Parameters of processing sheet: thickness from 3 to 200 mm.

Overall length is 14000 mm; beam of the sheet is 4000 mm.

Moscow
Assembly of metal structures of covering and fronts of passenger terminal in airport "Vnukovo" 2009
Near 10 000 tones of metal structures was manufactured.

Feasibility of equipment

In the manufacture of details from profile metal-roll we have an opportunity to make a profile sawing, drilling (countersinking, threading) in vertical and horizontal planes. We can also make a profile cutting with gas cutter and bores of different configurations, cutting and angle bar puncture.

- The height of processed profile is 80-1220 mm.
- The overall length of blank is 12000 mm.
- The smallest length of blank is 2500 mm.

The details are manufactured of different configurations and complexity according to a present program. Positioning exactness of machines with CNC is 0.5 mm.

We have bandsaw machines "FMB" and "Behringer" for cutting profiled bars with section up to 400x400 mm.

Peripheral milling and endmilling machines allow to bevel, to process detail ends and edges, to mill constructions "ready-assembled".

In the manufacture of details from the pipe, the following actions are made:

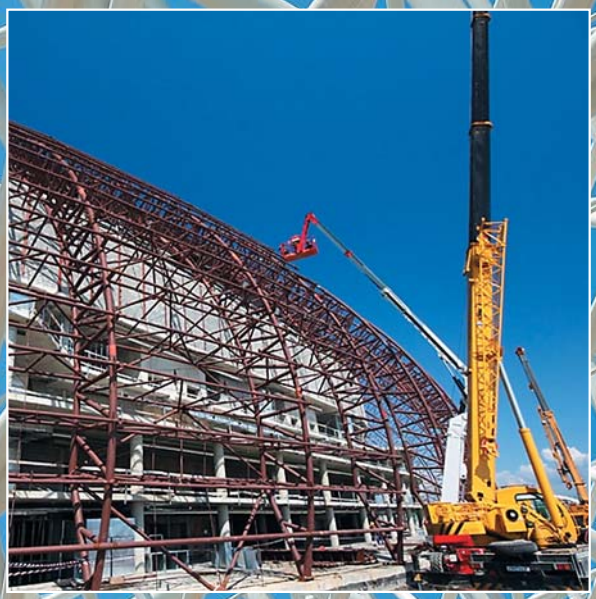
- cutting of pipe on back length (straight or angular cut)
- beveling on the butt end
- cutting-out of mortises and holes for joining of pipes

The diameter of possessed pipes is up to 1524 mm.

The length of possessed blanks is from 600 mm to 15000 mm.

Sochi. Assembly of pipe trusses Large Ice Arena, 2011
The dome of the building was made by 7 large-span erection trusses with bay of 94 meters.

Frame lobby was made by 68 falcate pipe trusses.
The total volume of manufacturing of metal structure is 3025 tones.



Pipe-bending machines

The plant has several pipe-bending machines including:

Pipe-bending machine with heat HDTV, model 465

The machine is for pipe bending with heat HDTV and formation bend with the help of sensing roller. The range of bending pipes on outside diameter is 127-466 mm. The maximum thickness of the pipe wall with outside diameter 465 mm is 20mm. The least radius of bending pipe on the center line is 1,5 diameter. The greatest radius of bending is not limited. The overall length of pipes is 15000 mm.

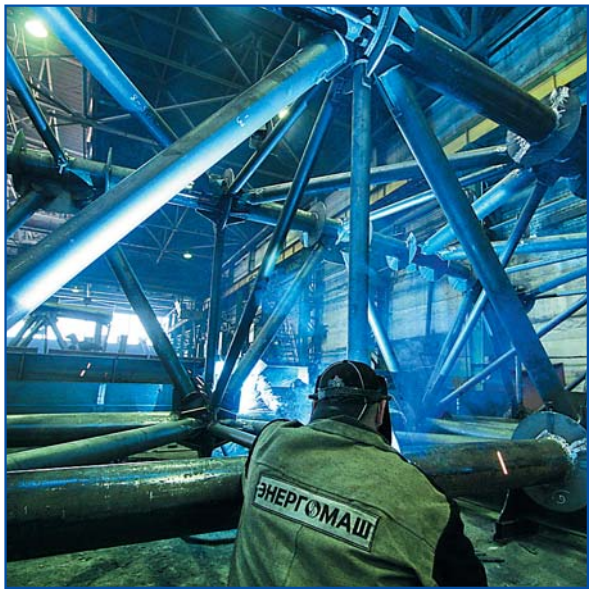
Pipe-bending machine with heat HDTV, small model

The machine is for pipe bending with heat HDTV and formation bend with the help of sensing roller. The range of bending pipes on outside diameter is 83-325 mm. The maximum thickness of the pipe wall with outside diameter 325 mm is 10mm. The least radius of bending pipe on the center line is 1,5 diameter. The greatest radius of bending is not limited. The overall length of pipes is 15000 mm.

Section bending machine "Haeusler AG" allows to bend pipes of different diameters from 102 mm and more with the wall thickness from 5 mm to 70 mm. The least radius of bend is 1400 mm.

Moscow.
Shopping center "VEGAS", 2009
The metal structures of 5 domes were made. The total value is 1650.

Feasibility of equipment
Welding

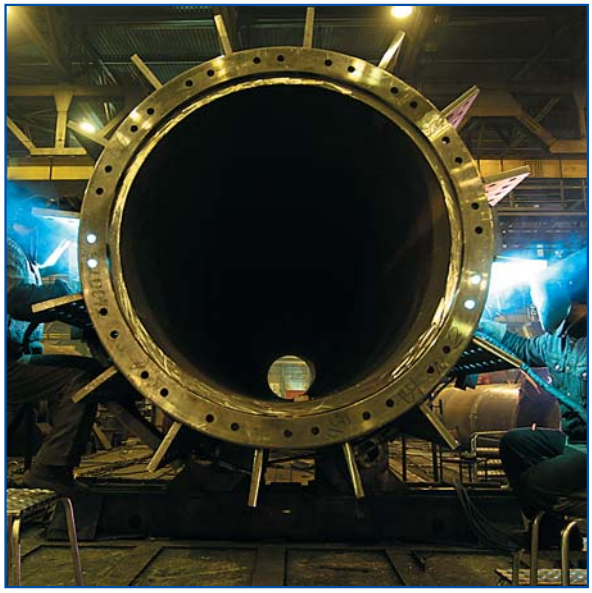


Semi-automatic welding of constructions is made with absorbers on the base of PowerWawe 455 of American Company "Lincoln Electric".

We have a portal machine for assembling for manufacturing of H-beam cores with the height from 400 mm to 2500 mm. We also have machines of automatic welding under the layer of flux metal.

A machine works for correction of "shrinkage distortion".

There are two moving welding console installations of Italian Company "Corimpex Srl". These installations are fitted with automatic welding heads "Lincoln Electric" and tracking of counters system. This equipment is used for automatic welding of longitudinal welds of details or construction of length up to 15 meters.



All welders are certified in National Agency for Testing and Welding (NAKS) by Fire Safety 03-273-99. In 2008 the certification of welders was gone by European Norms DIN EN 287-1 "The Certification of Welders – Nonpressure Welding – Part I: Steel" and the welding process by DIN ISO 3834 "The Quality System of Welding Production. Metal Nonpressure Welding". We have the certificates TUV/ SUD Industrie service.

According to requirements of contract we make the necessary controlled assembling in plant conditions. The difficult parts of construction are passed 100% assembling before installation.

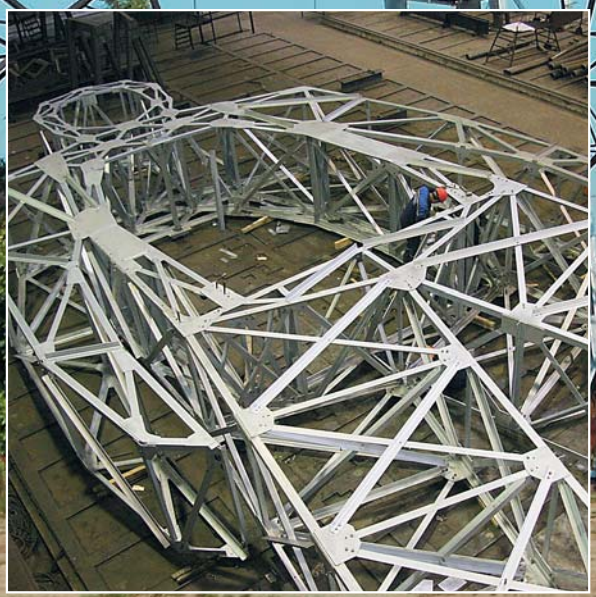
Painting, packing, shipment

There are two painting chamber drying oven of the firm BOSS (Italy) in the warehouse of finished products. The constructions are painted of the weight up to 40 tons and the length up to 13 m there.

The metal constructions can be protected of any paint materials according to requirements of project and customer preferences. There are variants of drawing of finishing paint on the galvanize surface of metal constructions.

The metal constructions are packing for comfort of assembling. The special schemes of shipping and packing are being developed for the shipment of complexity welded constructions. These schemes are submitted and confirmed by carrier organizations.

Power transmission line support from galvanized siding in the figurate of the skier on the landfill in Xotkovo in the Moscow Region. The height of power transmission line support is 32 meters. Weight is 41 tons. The structures of JSC Energonash (Belgorod) – BZEM are made in 2011, mounted in Adler.



The hot-dip galvanizing

Using the great opportunities of zinc we can help you to forget about the problem of corrosion for many years.

Today the hot-dip galvanizing is one of the most progressive and economic way of ferrous metal protection from corrosion. It has well proved in power, the chemical industry, construction. It is possible to use this type of covering for power transmission line supports, lighting masts, lanterns, wood building, road protection, electro technical products, frames of industrial buildings with aggressive conditions of manufacture, the equipment of cattle farms.

Hot-dip galvanizing gives the following advantages:

- increase of durability of designs
- economy of means for painting
- increase in the between-repairs period
- improvement of consumer qualities
- increase of competitiveness of production

The site of hot-dip galvanizing works at the Factory since 2001. The line consists of several baths in which pass preparatory operations of clearing, degreasing, fluxing of designs and products. The final process of direct galvanizing occurs in a horizontal bath in the sizes: length - 12,5 m, width - 1,5 m, height - 2,5 m in zinc-nickel flux at temperature 440° - 450°. In some minutes on a surface of metal is formed the layer of zinc by thickness of 45-250 micron, depending on mark of steel and thickness of metal.

Annual production rate of a bath is 25000 tones of metal designs.

The Ryazan Region
Assembly of pipeworks of the dome limestone warehouse of Serebrianskiy Cement Plant 2011.
2000 tones of structures are made for the object of Serebrianskiy Cement Plant.

Control

There is a Central laboratory of facility at the factory. It includes:

- testing laboratory
- laboratory of nondestructive method
- laboratory of metrology

All laboratories are accredited on the execution of the necessary types of control and proving.

Testing laboratory is completed with equipment and measuring means. It allows to realize the whole types of destructive method and proving of materials: chemical analysis, metallographic and mechanical examinations according to requirements of legal documentation.

According to the requirements of project raw materials are passed incoming control. The production is undergoing with visually-measuring such as: ultrasonic, magnetic-particle, capillary and radiographic control.

Samples are manufactured from metal-roll using in the project. The mechanical testing is made on them. They are: static bending, impact bending, hardness of the weld, heat-affected zone and others.

The laboratory of metrology makes the control in Federal Agency on Technical Regulation and Metrology and calibration standards and samples. We have also the accreditation certificate.

The results of control and proving are registered on the paper and entered into an electronic database.

In 2010 4 long-span supports of the type AT-103 with high 124 meters are made over the river Ob. Customer – LLC "Yugraelectrosetstroy". Weight of each support is 290 tones.

Power transmission line support

One of the directions of our company is manufacturing of metal constructions of power transmission line support. Production capacity of our plant allows to manufacture the metal poles up to 500 tones in a month. We use hot galvanizing or finish painting in manufacturing of metal poles.

There are different types of poles in nomenclature:

- the metal constructions of anchor-corner masts and intermediate poles for VL 35-750 KV
- the metal constructions of large-span supports and dead-end structures for VL 35-500 KV
- the metal constructions of tubular mast for VL 10-750 KV
- the metal constructions of portal SWYD 35-750 KV
- the metal constructions of supports 10-220 KV
- the metal constructions of antenna supports and tower of cellular communication
- the metal constructions of foundation pilings

The metal constructions are manufactured by standard projects of the following Institutes: "Energosetproekt", "Selenergoproekt" and "Teploelectroproect" and others. The metal constructions meet the requirements of GOST 23118-99 "The steel building constructions", SP 53-101-98 "Manufacture and quality control of building steel constructions".

The Quality Management System of the plant is certified. It is functioned according to the International System ISO 9000-2001.

The code certificates of the system "Mosstroycertification" are received on the constructions of power transmission line support, outdoor switchgear and tower of cellular communication.

In 2010 the plant entered into SRO "The National Organization of Designers".

We have received the possessive conclusion of the certification commission JSC "FGC UES" for compliance of our products to requirements of JSC "FGC UES" and JSC "IDGC Holding".

Foot-bridge in Podgoricza City, Montenegro republic, 2008
Weight of metal structures is 190 tones.

Bridges

Our plant has a good experience in manufacturing of the bridge conduits. The last significant achievements are:

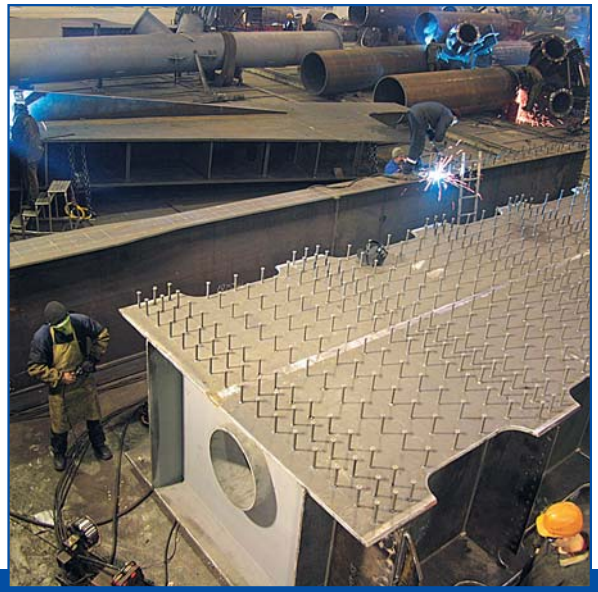
- trestles on the transport junction "Areda" in Sochi, 1200 tones
- arch bridge of transport junction "The Blue Distance" in Sochi, the Adler District, 1060 tones
- pedestrian bridge with carriers from circular pipe with diameter up to 1020 mm, the Maracha, Montenegro, 193 tones
- highway bridge, the Dnieper, Belorussia, 300 tones
- span with radiuses in two directions for encircling highway, Saint-Petersburg, Rzhevka Station, 12000 tones

At present time bridge superstructures are manufactured according to the requirements of STO-GK "Transstroy"-012-2007 "The steel constructions of bridges. Prefabrication" (The development contractor is the group of companies "Transstroy".

The rust protection is performed by different schemes according to STO 001-2006 "Protect metals against corrosion with staining method". The details of bridge constructions are exposed defection in shortblasting chambers before painting. We have also the own HDGL (Hot Dipped Galvanizing Line) at our plant.

Shopflors with the length up to 36 meters and crane with carry up to 60 tones allow to manufacture the large dimensional bridge blocks and to carry out the controlled assembly.

The quality control is carried out with the help of "The Quality Manual". It was developed according to the requirements of GOST R ISO 9001-2001. We use the state-of-the-art equipment of the ultrasonic testing for weld control. QCD and independent bridge inspector accept the constructions. (We have the post of Bridge Inspection at our plant). We give the Quality Certificate with sign and Bridge Inspection's stamp on the production.



Sochi.
Frame assembly of indoor skating building. Weight of metal structures is 7000 tones.
The unique cover is made by 8 large-scale pipe trusses, 200 tons each. Bay is 104 meters.

The metal structures from the pipe

JSC Energomash (Belgorod) – BZEM is one of the few enterprises in Russia which allows the building constructions from the pipe.

In the last years we made a wide range of interest orders with pipes using. They are:

- 5 spatial domes of SEC "VEGAS" in Moscow
- the passenger terminal in airport "Vnukovo" in Moscow
- the entrance halls of metro station "The Slavonic Avenue" in Moscow
- the pedestrian bridge passed the River Maracha, Montenegro
- the process installation of wood coal preparing PPM in Syktyvkar
- 10 metal poles of passenger rope-way in Nizhni Novgorod

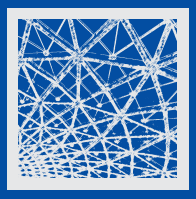
We recommend to use the constructions from pipe profile because they have the great preferences in comparison with constructions from usual profiles such as:

- a small proportion of section
- the same stability section in all directions
- the equidistance of material from centroid of section
- the strength balance of section in all directions
- the smallest area of constructions paint
- a possibility of rolling in any directions
- the simplicity of constructions galvanizing from pipes
- a highness of elements typification
- a wide range of typical sizes of circular section
- the aesthetic appearance of structures

Football stadium on 45000 audiences in Kazan

In 2012 the outstanding event happened. It was metal structures output of 2000000 tones since the foundation of the plant.

The anniversary tone entered into the constructions of unique athletic facility. It is "The football stadium on 45000 audiences in Kazan".



JSC Energomash (Belgorod) – BZEM

165, Volchanskaya street, Belgorod, 308017, Russia

Telephone: (4722) 35-43-44

Fax: (4722) 35-42-24

The factory of metal design

Telephone: (4722) 21-10-21, 21-39-96

Fax: (4722) 21-10-50, 21-11-92

e-mail: **zmk@energomash.ru**

www.zmkbelgorod.ru

ENERGOMASH