



TRADITION ■ INNOVATION ■ QUALITY



IHB METAL CASTINGS AD is the inheritor of LEYARMACH AD, a joint stock company with majority shareholder ZMM BULGARIA HOLDING AD, which was founded in 2001. Originally the foundry was built in 1985 and has its own facilities, which haven't stopped operating since its establishment.

ZMM BULGARIA HOLDING AD is the European leading producer of universal and CNC lathes, electric motors and hydro generators, which exports to more than 80 countries in the world. For more information please visit www.zmmbulgaria.com.

ZMM BULGARIA HOLDING is a part of **INDUSTRIAL HOLDING BULGARIA**, which is one of the biggest industrial groups in Bulgaria, operating mainly in the maritime transport businesses, port activities, ship building and ship repair, machine building and etc. For details: www.bulgariaholding.com.

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Our goal is to become the most reliable, the most searched and high-quality castings supplier in the Bulgarian and European markets, to respond to all of our customers' needs and requirements, with more high-tech, more innovative and effective solutions and to strengthen our position as a company with extensive experience and traditions in the area of metal casting.

Our philosophy is based on the personalized approach and cooperation with customers, which we consider to be the foundation for long standing and beneficial relationships. We firmly believe that you will find a professional and loyal partner in **IHB METAL CASTINGS**.





MANUFACTURE OF CASTINGS FROM GREY AND NODULAR CAST IRON

The castings of our company are well known among final users in the manufacturing of all kind of machine tools and metal cutting machines, wide range of castings for universal lathes, CNC lathes, like bodies, bed slides, columns, tailstocks, foundations, feed and gear boxes and etc., production of parts for hydro generators and electric motors, pumps and etc. all over the Europe. We provide also the pattern-core equipment, which is in accordance to our own metal casting technology and guarantee the high quality of the inner and outer surfaces of the castings.

Our main driving forces are the constant improvement and development, the implementation of new technologies and innovations. This process started from 2008 and since then the foundry operates with new induction furnace INDUCTOTERM 2x5t Dual Track. In the end of 2014 in **IHB METAL CASTING** installed three brand new innovative mixers for sand mixing. In the beginning of 2015 we renewed our regeneration system. We keep developing our production capacities and looking forward for new solutions and future possibilities.

- **IHB METAL CASTINGS AD have traditions in pouring of castings from modified gray cast iron - according to EN 1561 and nodular cast iron - according to EN 1563.**
- **We have specialized in castings with medium and high degree of complexity in single and small series (approximately 30 pieces per month) with single weights:**
 - For gray cast iron - from 80 to 8 000 kg per unit;
 - For nodular cast iron - from 50 to 3 000 kg per unit;
 - For steel castings - to 200 kg per unit.
- **We are capable of producing a wide range of wooden patterns and core equipment according to the requirement of our own casting technology, providing class of accuracy from GTB17 to GTB18 according to DIN1685.**
- **The production capacity of the foundry is more than 4000 tons annually.**
- **Castings are provided with and without rough machining regarding customer's preferences.**
- **The foundry has implemented and certificated system for managing of quality, in accordance with all of the requirements of EN ISO 9001.**
- **Our employees have the necessary professional qualification, knowledges and experience for the production of high quality castings.**



MOULDING

The foundry moulds and cores are made of furan mixtures. The furan resins with low nitrogen content and high quality are delivered by renowned European producer Filly Mazzon. Bulgarian quartz sand is also used.

The moulding is done on three production sections specialized in large-size castings, middle-size castings and small-size castings with the following mixers:

■ Vertical Mixer Spartan III 335AB - OMEGA (England)

The productivity is 35 tons per hour on the working site for large castings.

The maximum single weight of the castings is to 10 000kg.

The maximum dimensions of the moulding flasks is to L=9200mm, B=1400mm, H=1150mm.

■ Vertical Mixer Spartan III 310AB - OMEGA (England)

Productivity is 12 tons per hour on the working sites for middle and small castings.

The maximum single weigh of the castings is to 2000kg.

The dimensions of the standard flasks is to L=1500mm, B=1000mm, H max=620mm.



CORES MAKING

The cores manufacturing is on the basis of furan resins. Graphite and corundum paints with isopropanol diluent are delivered by our suppliers together with furan resins.

There are two mixers, which provide the manufacturing of the cores in two production sections:

■ Vertical mixer - Spartan III 305 P - OMEGA (England) equipped by radio system for identification of the core boxes with productivity of 6 tons per hour.

■ Fordath - mixer (Germany) with productivity 4 tons per hour.

■ The production sector is equipped by station for painting of cores.



POURING OF THE METALS

The melting shop where liquid metal is obtained includes the following aggregates:

- Induction furnace Inductotherm 2x5t Dual Track;
- Induction furnace Radyne - England . Equipped with two interchangeable ladles with capacities of 5 tons and 2,5 tons;
- Induction furnace AEG - Elotherm - Germany Capacity of 500 kg.

The foundry possesses stores and section for the preparation of the metal before the melting process. Pig iron, steel and cast iron scrap, own return, ferroalloys, inoculants, carburizers and others are put in the burden, controlled by certificates and foundry analysis. IHB METAL CASTINGS uses high quality inoculants of ELKEM - Norway.



IHB METAL CASTINGS produces:

Castings from modified gray cast irons, according to EN 1561/2000, with single weights from 80 to 8000 kg per unit, from the following grades:

- EN - GJL - 150;
- EN - GJL - 200;
- EN - GJL - 250;
- EN - GJL - 300;
- EN - GJL - 350.

Castings from nodular cast irons, according to EN 1563/2000, with single weights from 50 to 3000 kg per unit, from the following grades:

- EN - GJS - 400 - 15;
- EN - GJS - 500 - 7;
- EN - GJS - 600 - 3;
- EN - GJS - 700 - 2;

Castings from steel - up to 200 kg per unit.

BASIC ACTIVITIES



CLEANING OF THE CASTINGS

SHOT BLASTING AND SAND BLASTING.

The cleaning of the castings is done in a separate part of the workshop and includes removing of gating system, rough grinding, shot blasting in the chamber COGEIM - Italy, with 5 turbines and shot speed - 80 m/sec. The dimension of the working chamber is: 3000 mm x 3500 mm x 5350 mm. By customer's request sand blasting of the castings according to ISO 8501 - 1/1994 could be done.



ADDITIONAL PROCESSES AND TECHNOLOGIES

■ MANUFACTURING OF PATTERNS:

The patterns workshop has existed since the establishment of the foundry and has not stopped its working process. It is specialized in the manufacturing of wooden patterns. Most of the people who work there have long experience as workers in patterns workshops and can accomplish various complex tasks. A computer program "SolidWorks" is available in the patterns workshop.

■ SAND REGENERATION:

After pouring and chilling, the moulds are discharged from the moulding mixture which is totally recovered by means of installation KLEIN - Germany, with two vibrating mills, chilling and secondary recovering in a foaming layer. It is delivered automatically after that to the working sites by a low - speed pneumatic transport.

■ HEAT TREATMENT:

Heat treatment is done with a heat treating furnace "SDO-125" - Bulgaria.

$T_{max}=1000 \text{ }^{\circ}\text{C}$;

The dimension of the working chamber is: 2200 x 1000 x 1000 mm.

The following processes are performed there:

- stress relieving of the castings from gray cast irons;
- ferritizing annealing of the castings from nodular cast iron;





■ **PRIMING:**

At the customer's request priming of castings can be accomplished.

■ **CONTROL:**

Chemical control, control of mechanical properties, hardness, metallographic analysis, sand examination.

■ ■ **Central laboratory.**

The chemical laboratory has a vacuum spectrometer - new generation Spectromax for analysis of 26 chemical elements (for ferrous metals) and equipped with computer.

The metallographic laboratory has technology for metals structure testing including microscope NEOPHOT2. The mechanical tests of the metals are made with other machines for hardness, toughness and tensile strength. The tests of the sands and paints are carried out in a separate part of the laboratory with the devices GEORG FISHER. All of the devices have undergone obligatory tests, calibration and certification by the licensed institutions.

■ ■ **Dimensions control.**

Dimension control is performed by qualified personnel with a large scale of devices and appliances for measurements upon a table for tracing of the castings.

■ ■ **Magnetic particle examination.**

At customer's request magnetic particle examination could be done.

CERTIFICATES

IHB METAL CASTINGS issues a certificate for the quality for all of the manufactured products as follows:

- Certificate for chemical control;
- Certificate for mechanical properties, hardness and metallographic analysis;
- Certificate for dimensions control;
- Certificate for magnetic particle examination;
- Heat treatment's diagram;
- Certificate for sand examination and others.



PRODUCTS

Lathe bed, large size, EN-GJL-300



Lathe beds, small sizes, EN-GJL-250



Gear box for milling machine, EN-GJL-250



Bed for grinding machine, EN-GJL-250



Column for milling machine with CNC, EN-GJL-250



Lathe headstock iron casting, EN-GJL-200



Machining centre base iron castings, EN-GJL-300



Machining centre column iron casting, EN-GJS-400-18



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