

COMPANY PROFILE

The history of the company dates back to 1946 when within the enterprise Vitkovice Ironworks were established "Research and Testing Institutes" by the Ironworks Manager Decree of 27 June 1946.

The company VÍTKOVICE, J.S.C., as the only founder, established the company VITKOVICE - Research and Development, Ltd. by the Memorandum of Association dated 15th December 2000.

The General Meeting of 21st May 2007 approved the sale of the shares in VITKOVICE - Research and Development, Ltd. in the height of 99 % to the company TŘINECKÉ ŽELEZÁRNY, J.S.C. The sale was executed and this decision entered into legal force by the registration in the Commercial Register on 25th May 2007.

Based on the decision of the General Meeting on 27th February 2008 the company was renamed to MATERIAL AND METALLURGICAL RESEARCH Ltd.

At present the company MATERIAL & METALLURGICAL RESEARCH Ltd. is a research organization within the meaning of the regulation of the Commission of the European Union, General Block Exemption Regulation ("GBER") n. 651/2014 and communication from the Commission „Framework for state support of research, development and innovation“, Official Journal of the European Union 214/C 198/01 from June 27, 2014, both with validity from July 1, 2014.

The basic mission and strategic plan of the company is assuring technical and technological innovations and rendering services in the fields of metallurgy and material engineering aimed at increasing competitiveness of Czech metallurgy and heavy engineering.

MATERIÁLOVÝ A METALURGICKÝ VÝZKUM s.r.o. (The MATERIAL AND METALLURGICAL RESEARCH Co., Ltd., hereinafter referred to as MMV) is one of the last research institutions in the Czech Republic and the only centre in the Moravian-Silesian Region conducting the experimental and comprehensive material research in metallurgy and material engineering. It is specialized in the following:

- Research on producing and forming steels,
- Research on the processes of secondary metallurgy,
- Research on advanced forming technologies and controlled forming processes using the universal SETARAM plastometer,
- Evaluation of conventional and non-conventional material properties in the accredited testing laboratory of fatigue and brittle fracture behaviour,
- Evaluation of creep characteristics of materials,
- Chemical analyses and measuring emissions in the accredited and testing laboratory,
- Structural and phase analyses of metallic materials,
- Analyses of the causes of metallic material degradations,
- Production of ingot steels weighing up to 1,700 kg,
- Production of grey, alloyed and special cast irons weighing up to 700 kg.

Experimental and production facilities are concentrated in the company's accredited and non-accredited laboratories and the pilot plant. They include mechanical machining and testing shop which assures the production of test specimens, laboratory samples, devices and prototypes for individual research departments. The machining shop includes the centre for mechanical cutting of materials. The largest of the five saws enables to cut steel blocks with dimensions of 800x640mm.

The section 943 Laboratories consists of:

Accredited testing laboratory No.1300:

- LAB 1 Chemical laboratory
- LAB 2 Laboratory of fatigue and fracture behaviour

- LAB 3 Emission measurements

Laboratory of heat treatment

The accredited laboratory of fatigue and brittle fracture behaviour has developed the procedures for evaluating both the basic mechanical properties (tensile tests, impact strength tests, hardness measurement) and for assessing the non-conventional mechanical properties (fatigue properties of materials, brittle failure resistance using fracture mechanics parameters or non-conventional tests for setting brittle failure resistance, DWT, DWTT tests) that increasingly become a part of technical standards of business cases. The laboratory is equipped with MTS electro-hydraulic testing facilities with the capacities of 500 kN and 100 kN. The part of the given testing devices is the temperature chamber and the three-band resistance furnace enabling to run tests at temperatures ranging from -196 °C to +800 °C and a number of sensors that make possible to set special mechanical characteristics at temperatures up to 800 °C. INOVA 40 kN electro-hydraulic testing equipment is furnished with the static autoclave of 11-litre volume which is used to evaluate material properties of steels exposed to the water environment of high temperature and high pressure.

The chemical laboratory and emission measuring follow accredited procedures for chemical analyses of metallic and oxide materials from making iron and its alloys, analyses of gaseous, liquid and solid wastes including their extracts, evaluation of corrosion resistance of material using HIC and SCC tests in hydrogen sulphide. To test the corrosion resistance of material in hydrogen sulphide, the separate testing laboratory is at disposal. It is equipped with safety device signalling exceeded concentrations of hydrogen sulphide in emergency situations.

Emission measurements have been accredited procedures for measuring emissions of particulate and gaseous pollutants, sampling procedures for the determination of heavy metals and persistent substances in emissions.

Within the research and commercial activities, this laboratory performs analyses of special types of steels and alloys including the development of new analytical methods and technologies for processing wastes and their analyses.

In the context of the project "Regional Materials Science and Technology Centre" (hereinafter RMSTC) are performed for Accredited testing laboratory new investments and test equipments to facilitate their further development.

The Laboratory Section also comprises the heat treatment laboratory equipped with 11 laboratory furnaces (controlled by a single computer) enabling long-term laboratory heat treatment with quenching in water and oil.

Non-accredited laboratories, that are the part of the research sections, comprise the following:

- The metallographic laboratory equipped with two digital metallographic microscopes, and the laboratory of structural and phase analyses furnished with the JXA-733 microprobe fitted out with 3WD Advanced Micro System, the JSM 5510 scanning electron microscope and the JEOL transmission electron microscope.
- The creep laboratory that is one of the largest laboratories in Central Europe. 40 classic lever machines and 1 multiple machine for simultaneous inspecting of as many as 345 test specimens. Due to current and future restoration of classic energy sources in the Czech Republic, long-term utilization of this laboratory capacity can be expected.
- The SETARAM plastometric laboratory testing equipment that was refurbished in 2006 within the Ministry of Education, Youth and Sports project – the Research Centres - "Research and Verification of New Unconventional Procedures of Metallic Material Production".

The pilot plant is equipped with the induction furnaces with capacities of 1,700 kg and 350 kg respectively, and the equipment for electroslag remelting of electrodes with the diameter of 320 mm fitted out with VKT 2400 LAC Rajhrad chamber furnace required for heat treatment of ESP ingots.

Last but not least, the pilot plant comprises the vacuum and overpressure induction furnace (1,700 kg) costing CZK13, 878 thousand within the Ministry of Education, Youth and Sports' project of "Research and Verification of New Unconventional Procedures of Metallic Material Production".

Science and research activities are directed mainly to industrial enterprises of the Moravian-Silesian Region (EVRAZ VÍTKOVICE STEEL, a.s., TŘINECKÉ ŽELEZÁRNY, a.s., VÍTKOVICE, a.s.), ČEZ, a.s., and other

external customers from all over the Czech Republic. The current cooperation with the VŠB-Technical University of Ostrava in the project of the RMTVC is of the utmost importance.

Besides external activities dealing with technical and business cases, the MMV Company focuses also on solving scientific projects of tenders declared by the Ministry of Industry and Trade, the Ministry of Education, Youth and Sports, the Czech Science Foundation and of regional competitions announced by the Ministry of Regional Development.

No less important part of the MMV's new business policy is the international cooperation in research and development based on the framework programmes of the European Union, the Research Fund for Coal and Steel (RFCS) and international projects of basic research (COST). While solving projects, bilateral cooperation with research centres in Belgium, Germany, Italy, Austria, China, France and the Netherlands has also been established.

The way how to achieve implementation of all the strategic goals and how to enhance the company's competitiveness is the subject of the "MMV's Quality Policy and Quality Objectives" in accordance with ČSN EN ISO 9001 standard.