



# Laboratory of Experimental Metallurgy

## Principal goals and activities

- Research in metallurgy and preparation of metal and alloy melts.
- Research of metallurgy in malleable iron and vermicular graphite iron.
- Research in metallurgy of aluminium – inoculation and modification effects.
- Research in metallurgy of copper alloys.
- Research in metallurgy of zinc alloys.
- Metallurgy of foundry alloys in terms of conditions for crystallization and cooling of castings.
- Monitoring of heat expansion properties in metal alloys in the transition from the liquid to solid state.

## Offer of technology and expertise

- Determination of temperatures of solidification of metal alloys.
- Assessment of the values of heat contractility at various intervals of solidification.
- Determination of fluidity in metals.
- Determination of propensity of metals to forming caved surfaces and shrinkage porosity.
- Determination of the influence of various types of foundry moulds to crystallization processes in castings.
- Determination of chemical composition of Fe-based alloys (steels and cast iron), and alloys of Al, Zn, Cu, Ti, Ni and Mg.
- Training/seminars on topics: „Metallurgy of foundry alloys“.

## General focus of laboratory

- Experimental metallurgy research in metal melts.
- Assessment of influence of inoculants on metallurgy of cast iron types.
- Assessment of various types of influence of modifiers on the structure of graphite in cast iron.
- Assessment of metallurgy properties of metal melts.
- Assessment of thermal expansion properties of metals during assisted shrinkage.
- Assessment of thermal expansion properties of metals during solidification.
- Experimental identification of the coefficient of thermal shrinkage of metals.

## Specific instruments and outcomes

- 11016S Classic\* electric resistor furnace (up to 1550°C, Ar, N<sub>2</sub>, CO<sub>2</sub>).
- Bruker Q4 TASMAN spectrometer.\*
- IC 40 electric induction furnace, medium frequency.
- Equipment for monitoring of thermal expansion properties in metals during assisted shrinkage.
- Equipment of the metallography lab.

\*in cooperation with the Department of Nanomaterials, Advanced Technology and Innovation at TUL

