POLITECHNIKA POZNAŃSKA

INSTITUTE OF MATERIAL TECHNOLOGY

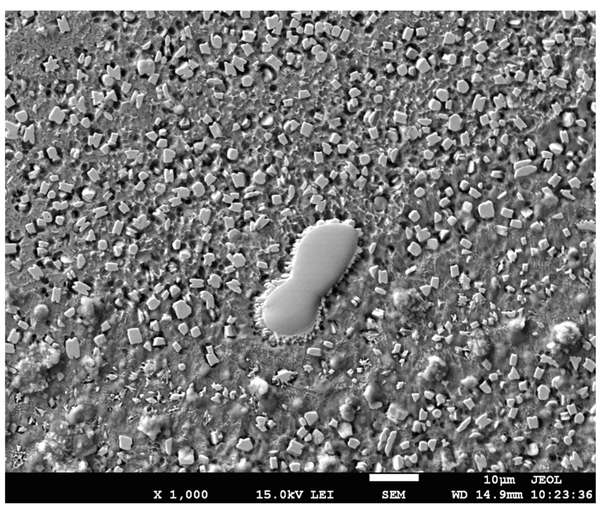
Division of Foundry and Plastic Working

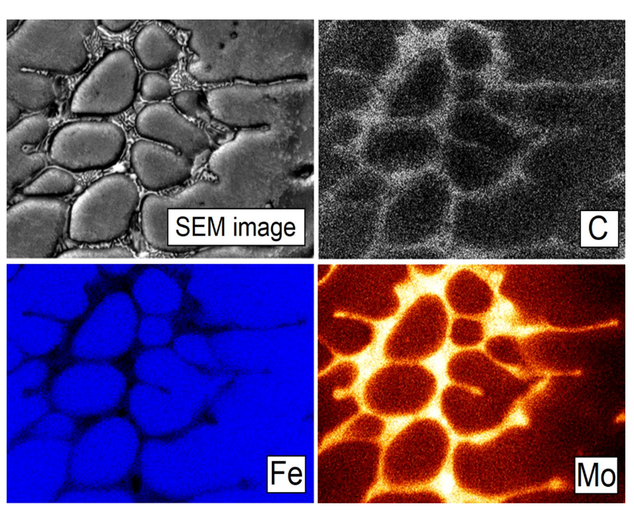
Scope of research

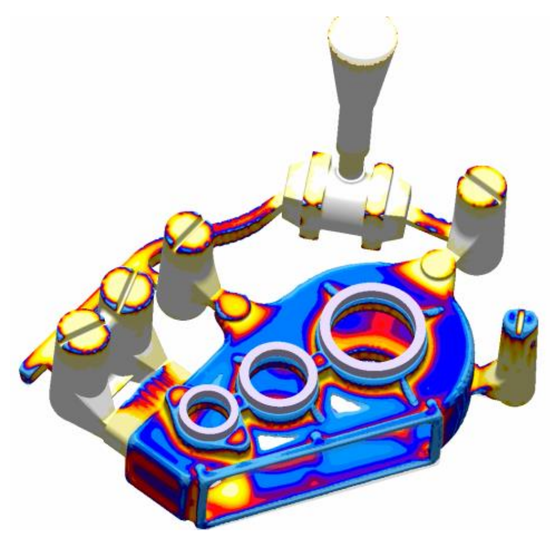
The studies:

- Structural studies of metals and surface layers of modern cast treated alloys
- Development of an innovative technology for producing cast iron for operation at low temperatures
- Manufacturing of composite castings by the method of fused models reinforced with carbon fibers based on the aluminum matrix
- Precision casting technology using the investment casting method
- The issues of simulation of casting processes and plastic forming of modern alloys with an analysis with the use of artificial intelligence (AI) issues
- Construction of the facility for aluminium alloys electromagnetic stirring during casting

The latest exemplary results of research



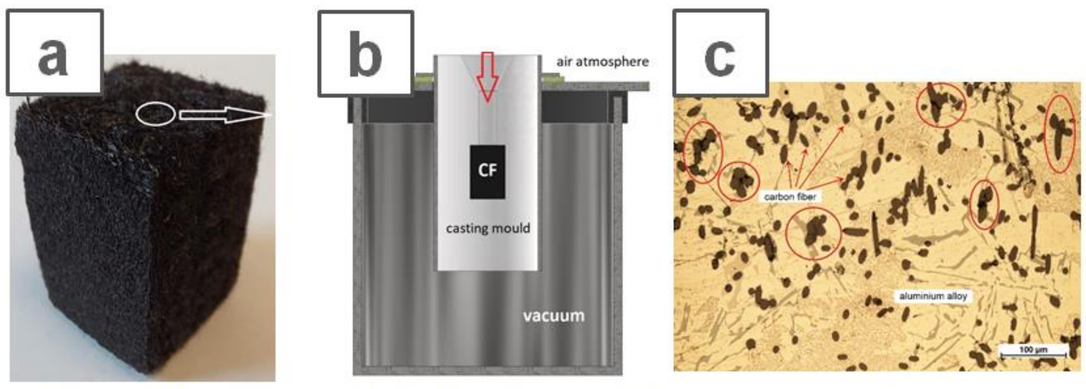




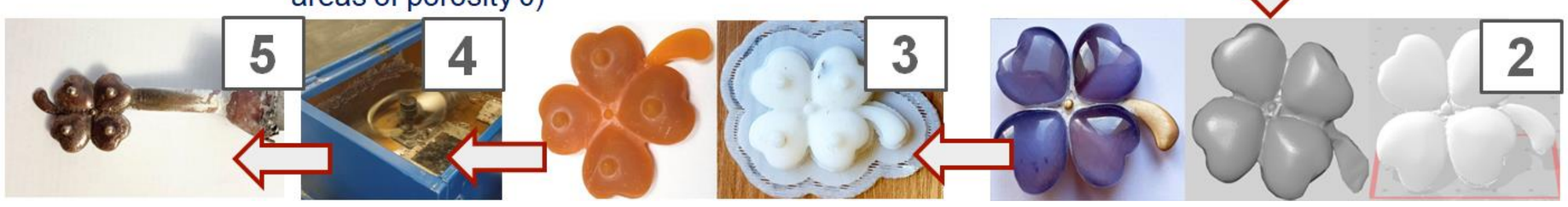
Fe_WC composite coating on steel

Fe_Mo2C composite coating on steel

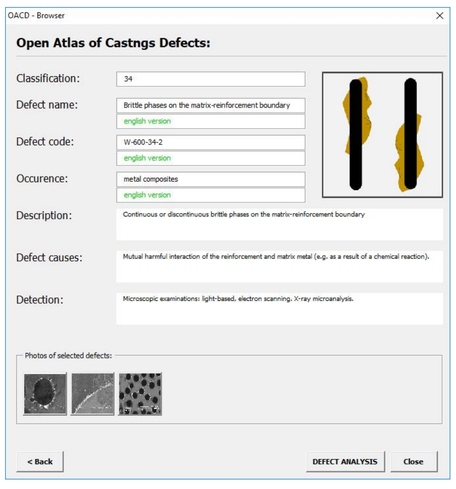
Simulation of the casting process



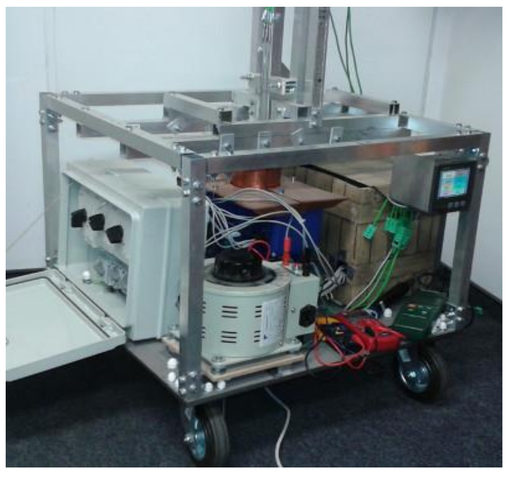
View of the CF sample (a), scheme of the vacuum casting station (b), micrographs of the Al/CF composite with marked areas of porosity c)



Studies of the surface quality of reconstructed small-size objects made of various printed and cast materials
(1 – 3D optical scan, 2 – real object and computer models maded using DPP and FDM method, 3 – printed models,
4 – stand for casting using the centrifugal force, 5 – example of real object made using the DPP method)



Innovative OACD authors system with AI algorithms for analysing and classification images of casting defects



The device intended for solidification in the magnetic field