INNOVATIVE MATERIALS

The research group deals with a traditional specialisation of the University of Miskolc, namely the investigation, development and optimisation of the properties of various structural materials and products (metals, ceramics, polymers, composites).

COMPETENCIES

- Development of metallic, polymeric, ceramic and composite materials
- Investigation, development and failure analysis of products and components made of the above materials; optimisation of their composition
- Design and testing of special recipes and mixtures
- Design and laboratory testing to support industrial manufacturing processes

SERVICES

- Material and structure tests
- Production planning and support
- Manufacturing cause analysis
- Material improvement
- Failure mode analysis
- Laboratory and semi-industrial level production

TOOLS

- Microstructure and composition characterisation: SEM, XRD, FTIR, XRF, CT, DMA, DTA, DSC, HSM, ICP MS, GDOES, RAMAN, specific surface, porosimetry, chromatography
- Mechanical testing: compressive, tensile, bending, impact strength, hardness (metal, ceramic, polymer), roughness, wear resistance
- Normalised and special material testing: dilatometry, thermal conductivity, weather resistance, rheology
- Technological preparation, shaping, heat treatment equipment for all material groups
- CAD and simulation (rolling, plastic forming, injection moulding)

REFERENCES

- Research and development of crystalline and amorphous nanostructured materials (GINOP-2.3.2-15-2016-00027)
- Development of technology for new, marketable rolled aluminium products on the basis of materials science (GINOP-2.2.1-15-2016-00018)
- ICARUS - Innovative Coarsening-resistant Alloys with enhanced Radiation tolerance and Ultra-fine-grained Structure for aerospace application (713514)
- Development of environmentally friendly solders for the automotive industry on the basis of materials science from primary and secondary raw materials (TÁMOP-4.2.2.A-11/1/KONV-2012-0019)
- “RubCon-Product and prototype development of building materials using waste materials”, GINOP-2.1.7-15 (R&D subcontractor)
- “Research and development of foam glass” (R&D subcontractor) - GINOP-2.1.1-15-2015-00706

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