

Department of Technology

The department offers

► Studies and research on:

- modern technologies of mould- and core-making (cold-box, warm-box, shell moulding, self- and chemo-setting sands),
- conventional mould-making technologies,
- sand reclamation from waste moulding and core mixtures,
- processing of waste sand for use in other sectors of industry,
- management of industrial waste in foundry sector,
- modern machines, equipment and control-measuring apparatus for foundry industry,
- technology of making castings from alloys of ferrous and non-ferrous metals in sand moulds and in permanent moulds,
- modern methods to examine physical, chemical and technological properties of moulding materials and sand compositions,
- organic and inorganic binders, protective coatings, glues and release agents,
- mechanisation of moulding technologies,
- development of modern raw materials for moulding sands and of the respective manufacturing processes,
- manufacture of test and pilot lots of aluminium castings in dies and sand moulds.

The scope of studies on moulding materials, auxiliary materials, and mould- and core-making technologies.

- choice of moulding and auxiliary materials for use in foundry technology,
- development and application of new moulding materials (binders, hardeners and special additives) and of new mould- and core-making technologies for casting production,
- development and application of new protective coatings for sand moulds and cores to cast alloys of ferrous and non-ferrous metals and of special products (glues, sealing pastes, and release agents),
- designing of modern apparatus and methods to test the technological properties of moulding materials and sand compositions,
- testing physico-chemical and technological properties of moulding materials, moulding and core sand compositions, protective coatings and special-purpose materials.

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The Department offers modern and advanced control and measuring instruments. The Department of Technology offers assistance in the choice, designing and improvement of mould- and core-making machines.

The Department offers development of technologies to manufacture new casting types and improvements introduced to the technological processes applied so far to increase the quality, raise the cast metal yield, reduce the emission of toxic compounds and the level of rejects.

- ▶ The scope of studies on foundry sand reclamation and utilisation:
 - choice of best reclamation process adjusted to the sand type or to a mixture of sands,
 - determination of conditions for waste sand processing, management and use in other sectors of industry. The Department offers a rich choice of the equipment for processing of waste sand with information on potential users of the processed waste moulding sands and post-reclamation dust,
 - field studies to determine under the specific conditions of a foundry shop the feasibility of a reclamation process with suggestions on the choice of equipment. The Department offers a rich variety of installations for the preliminary sand processing before reclamation and for proper reclamation; the installations are checked in industry for the reliability of operation,
 - studies on the quality of reclaim from various moulding technologies and on the degree of its re-use. The Department offers a choice of pilot units for foundry sand reclamation and performs standard and special tests on various reclaims,
 - feasibility and design studies of the reclamation process, supervising the construction and start up of reclamation plants in foundries, and implementation of the reclaim in current foundry production process,
 - management of waste produced by various industrial processes, like metallurgical waste, e.g. rolling scale (used in fabrication of charge briquettes), chips and metallic dust (making a full-value charge material used in metallurgical processes), industrial dust (used to make riser sleeves and parts of insulation for the gating system and foundry moulds).

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