Laboratory of Crushing and Classification
Classification Laboratory Unit

I. Location of the laboratory:

Research, Education and Innovation Centre of Earth and Environmental Science
University of Miskolc building C/2 hall 1

II. Operating institute of the laboratory:

Institute of Raw Material Preparation and Environmental Technology

III. Scientific head of the laboratory:

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IV. Responsible researcher/person:

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V. The aims and tasks of the laboratory on the education, scientific and research fields:

The main task of the laboratory is the assessment of basic separation phenomena of coarse disperse systems, thru direct methods based on the particle size differences, and thru indirect methods based on their settling velocity; the basic and applied research on the separation of primary and secondary raw materials. Other tasks involve the development of separator technologies and equipment. Further tasks of the laboratory include the product quality assessment of different crushing processes and optimisation of the feed in different beneficiation and comminution assignments.

Tasks of education and research:

- Meeting the practical training demands of the laboratory practices in the Hungarian and English language BSc and MSc courses, and postgraduate specialist training courses
- Ensuring the conditions for theoretical and practical research within the framework of PhD studies
- Providing experimental and development background for relevant national and international research, innovation and R&D tasks and projects

VI. Laboratory experiments, services (on-site experiment is possible):

- Physical analysis of disperse systems (particle size distribution, determination of moisture content and particle shape), analysis of the classification properties for a given raw material and assessment of optimal classification method.
- Defining the operating conditions of crushing equipment
- On site monitoring and analysis of classification equipment

VII. Available equipment for education, research and innovation

- Vibrators (BBK; Ferrari)
- Mogensen sieve (1,2 $m^2$ screen surface, wide range of sieve opening sizes)
- Laboratory sieves (from 0,063 mm to 150 mm opening size)
- Standard screens for analysis of municipal wastes
- Hydrocyclon (with different vortex finder geometry)
- Aircyclon and adjacent measurement units
- Cross flow wet classifier
- Airflow sieve
- Banascreen

VIII. Laboratory development plan, requirements:

The development of the laboratory will be realised around three main development lines. It is important the maintenance of the existing equipment, the restoration of the worn off equipment and their mounting with modern measurement devices. This also includes the improvement of the health and working conditions, like the improvement of the whole dust collection system. To solve these tasks, it is important to operate the classification laboratory in a dedicated room, the design of which is of fundamental importance.

Important area of development and the activities and acquisitions, that must be carried out in parallel with it:

- The conservation, maintenance, and reparation of the existing equipment, the mounting of existing equipment with further screen panels
- Development of the logistic solutions for the feed and products of the existing equipment, considering equipment access, capacity and work and health aspects, sample storage
- Double-deck laboratory vibrating screen
- Wet spiral concentrator
- Different measurement and measurement data recording equipment
- Laboratory particle size analysis equipment (sieves, vibrating table)

IX. Main professional partners / references:

Our laboratory has cooperated with several domestic and international partners in the past, and has still active cooperation with many of these, among which we mention the following partners as a reference: MOL Ltd., CEMKUT Plc., Vertikál Ltd., ALCUFER Plc.; OMYA Hungária Plc.; 3B Hungária Plc.; Bay Zoltán Nonprofit Plc.; Nitrokémia Ltd.

X. Compiler of the information material: Izabella Márkus


Mogensen sieve

Miskolc, 19 June 2024