



- 1 *Dynamical Difference Calorimetry (DSC)*
- 2 *Copper Slag*
- 3 *Dilatometer*

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BUSINESS UNIT SLAGS, SLUDGES, LANDFILL

Fraunhofer Project Group Materials Recycling and Resource Strategies IWKS

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Target

Many inorganic and composite materials that end up in a landfill today do not belong there!

Ash, dust, slag and sludge frequently contain an interesting cocktail of valuable substances that should be kept in the cycle.

The Business Unit Slags, Sludges, Landfill of the Fraunhofer Project Group Materials Recycling and Resource Strategies IWKS is your ideal partner with respect to developments for the effective and sustainable use of resources contained in waste materials from the incineration and grinding industry.

New ways to optimize or enhance reusable material cycles are to be found. Together, the goal can be reached to establish an entirely waste-free solution.

Tasks

In close cooperation with partners from industry, our Business Unit develops innovative salvaging concepts as well as future-oriented methods for intelligent crushing and selective separation of valuable substances from laboratory up to pilot plant scale.

Our service portfolio covers mechanical, physical, chemical and biological methods that are targeted for further development and are combined for your ultimate application.

Are you interested in a cooperative project?

Just contact us, we are glad to develop the best solution for your specific application.





1 Focused Ion Beam (FIB)

2 X-Ray Diffraction (XRD)

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We offer you:

- Conceptual design and feasibility studies
- Economic feasibility studies
- Development of pilot plants
- System analyses for the increase of raw material and energy efficiency
- Optimization of waste and resource management
- Optimization of relevant process steps all along the value creation chain
- Development of new reusable material cycles



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Examined materials:

The following material systems will be processed:

Ashes and slags

- Incineration ashes and incineration dust
- Metallurgical slag
- Mineral systems
- Composite materials
- Glassy materials of differing forms

Industrial sludge

- Sewage sludge
- Grinding sludge
- Galvanic sludge
- Red mud
- Other industrial sludge

Methods of treatment

Methods for the treatment of slag-like and sludge-like material systems are supplemented by supporting analytical procedures.

Physical process technology

- Mechanical treatment (crushing, sizing, grinding)
- Separation technologies (electrodynamic fragmentation, sorting processes)
- Immobilization of hazardous substances (encapsulation, thermal treatment)

Chemical process technologies

- Leaching for the separation of hazardous and valuable substances
- Recovery of metals such as zinc and copper from mineral and organic sludge
- Separation of critical valuable substances such as phosphor

- Procedure for the extraction of technology metals (e.g. acid extraction, liquid-liquid extraction, particle-based magnetic separation)
- Distillation for the separation of oil and emulsions from metals and minerals

In-process analyses

- Flow analyses: production-oriented, energy-oriented, logistics-oriented
- Material flow analyses
- Process cost analyses

Methods of characterization

Qualitative and quantitative analyses of the chemical composition

- Chemical pulping
- Gas chromatography
- Inductively coupled plasma (ICP)
- X-ray fluorescence analysis

Structure and phase analysis as the basis for the evaluation of the secondary material in terms of its further use

- Microscopy (REM, TEM, etc.)
- Spectroscopy (IR, Raman, RFA)
- X-Ray Diffraction (XRD)

Identification of application parameters

- Thermo-optical measurement methods (TOM)
- Examination of the dry substance
- Determination of water content
- Thermal analytics