



**Materials
Processing
Institute**

Services Portfolio

Critical Raw Materials



Critical Raw Materials Services Portfolio

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By-product Valorisation

Recovery of metal from dross or skimmings

Melt metal-rich waste (dross) to reclaim usable metal for circular reuse.

Steelmaking dust recycling (Zn & Fe recovery)

Process electric arc furnace dust or blast furnace dust to recover zinc and iron, reducing hazardous waste and recovering value.

Coal fly ash rare-earth recovery

Recover valuable rare earth elements from coal fly ash using an innovative chemical process (e.g., carbo-chlorination combined with CO₂ utilisation).

Zinc-rich steel byproduct recycling

Treat steelmaking byproducts to recover zinc and iron, addressing stockpiled waste issues.

Upcycling waste into advanced materials

Convert low-value wastes into products.



By-product Valorisation

Metallic swarf recycling via briquetting

Compress metal turnings and swarf (with residual oils) into briquettes and test melting them to recover clean metal and separate oils for reuse.

Aluminium dross processing

Remelt and treat aluminium dross (metal skim from aluminium production) to extract usable aluminium and convert the residual oxides into a non-hazardous product.

End of Life Process Development

Li-ion battery recycling process development

Recover critical materials (Li, Co, Ni, Mn) from spent lithium-ion batteries through lab-scale mechanical and hydrometallurgical treatment.

Alkaline battery recycling pilot

Extract valuable metals (Zn, Mn) from end-of-life alkaline batteries via optimised two-stage leaching and crystallisation.



End of Life Process Development

Catalytic converter PGM recovery

Smelt shredded automotive catalytic converters to concentrate platinum group metals (Pt, Pd, Rh) into a metallic phase for extraction

Rare-earth magnet recycling

Extract rare earth elements (Nd, Pr, Dy) from end-of-life Neodymium-Iron-Boron magnets for reuse in new magnets

Electronic waste (e-waste) recycling pilot

Recover copper, precious metals, and plastics from electronic waste through shredding, physical separation, and targeted smelting of concentrates

Sludge and filter cake recycling

Process metal-rich sludges to recover metals

Mine Tailing Valorisation

Mine tailings valorisation

Reduce landfill, create extra value



Piloting / Testbed Hosting

Waste processing demonstration

Waste from one company is processed to produce a material that is then tested demonstrating a circular loop.

Process Scale-up

Upcycling /scaling up glass reactor experiments

Use lab-scale glass reactors to chemically upcycle waste in small batches to assess yields and conditions.

Process Optimisation

Lead-acid battery recycling pilot

Recover lead and plastic from spent lead-acid batteries, demonstrating improved methods for lead recovery and neutralization of acid waste.

Full Services Portfolio

Advanced Metals & Green Steelmaking

- Green Steel
- Product Development
- Process Improvement
- Extra

Advanced Materials Development

- Custom Alloy Development
- New Steel
- Supporting R&D
- Additive Manufacturing & Powder Metallurgy
- Additional Services

Characterisation and Analysis

- Characterisation and Analysis

Critical Raw Materials

- By-product Valorisation
- End of Life Process Development
- Mine Tailing Valorisation
- Piloting /Testbed Hosting
- Process Scale-up
- Process Optimisation

Sustainable Cement and Concrete

- Product Development
- Process Improvement

Powder Analysis and Additive Manufacturing

- Powder Analysis
- Additive Manufacturing
- Powder Processing

Energy and Process Decarbonisation

- Feasibility Studies
- Energy and Emission Optimisation
- Process Optimisation
- Leveraging Facilities

Facilities and Equipment

Full Services Portfolio

Training

Processes

- Ironmaking
- Desulphurisation of Iron
- Steel Plant Raw Material
- Primary Steelmaking
- Secondary Steelmaking
- Ladles
- Practical Steelmaking
- Stainless Steelmaking
- Electric Arc Furnace (EAF) Steelmaking
- Continuous Casting
- General

Supplementary

- Engineering
- Metallurgy
- Environmental Protection
- Management
- Research

Applications

- Circular Economy
- Digital Technology
- Analytical Techniques

Products

- Finished Goods

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