



## ABOUT

TU Delft is the largest and oldest Dutch public technical university, and conducts high-quality teaching and research. With eight faculties, TU Delft hosts over 19 000 students at bachelor and master levels, and more than 2660 scientific staff.

TU Delft has a strong research profile with its main focus on engineering and applied sciences. TU Delft researchers developed many new technologies used today, including Glare, a Fibre Metal Laminate used in the Airbus A380 skin, and the recycling technology in the field of materials innovations. TU Delft pays extra attention to developing solutions in today's major social issues of health, energy, environment, and infrastructures & mobility. TU Delft leads and participates in a large number of EU FP projects.

## EXPERTISE

TU Delft has strong expertise in metals extraction and recycling. It has multi-disciplinary and cross-faculty knowledge groups from mining, extractive metallurgy, recycling, product design for sustainability and life cycle assessments of raw materials.

The Department of Materials Science and Engineering (MSE) undertakes coherent and innovative research dedicated to development, production, characterisation, processing and recycling of materials, with a strong focus on metals. Metals Production, Refining and Recycling (MPRR), as a group of MSE, is active in education and research on primary metals production and recycling.

Resource efficiency, energy saving and reduction in global warming gases in metals production are vision of the group's research. Resource recovery and metallurgical recycling and refining for critical metals such as Rare Earth Elements (REEs) from industrial waste and EOL products – "urban mining" – are the main focus of the group's recent and future activities. Development of sustainable solutions to materials criticality and scarcity is our long-term research vision.

TU Delft is a core member of EIT Raw Materials (KIC Raw Materials) and participates in various EU FP7 funded projects on raw materials including Rare Earth Metals recycling REEcover and EREAN.

## FACILITIES & SERVICES

The department MSE of TU Delft has dedicated research labs for characterisation and control of microstructure of metals, joining and characterisation of mechanical properties, extractive metallurgy

in pyrometallurgy, hydrometallurgy, and electrometallurgy, with access to essential analytical facilities (XRF/XRD, SEM-EDS, EPMA, ICP, AAS, LECO).

For extractive metallurgy and metallurgical recycling, we have the following equipment to meet high quality research demands:

- advanced softening and melting equipment for high temperature packed-bed reactors (blast furnace ironmaking, 1800°C)
- high temperature drop-tube furnace for single particle behaviour (1600°C),
- molten salt electrolysis cell for metals production (1200°C)
- continuous online gas analyser
- thermal balance for characterisation of metals and minerals at elevated temperatures (TGA-DTA-DSC)
- glove box for storage and handling of sensitive materials and chemicals
- high-end potentiostats for electrochemical studies of aqueous solutions and molten salts
- electrowinning and electro-refining cells
- atmospheric and pressure leaching vessels and autoclaves
- solvent extraction cells for hydrometallurgical research



## MORE INFORMATION

Website: [www.tudelft.nl](http://www.tudelft.nl)

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