# TECHNOLOGY OFFER

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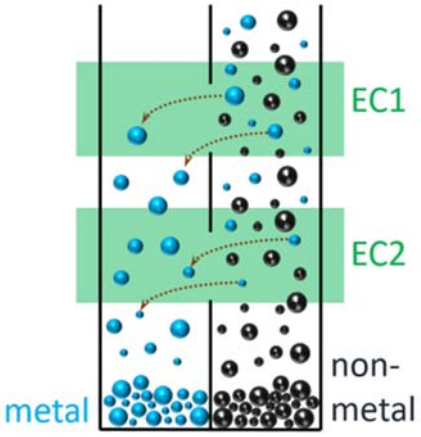
## Metal recovery from waste: Effective separation of smallest particles by a novel Eddy current technology

### BACKGROUND

We present a novel design of an eddy current separator to extract non-ferrous metal particles (e.g. aluminium, copper, silver, gold). The setup is optimized to separate sub-1-mm particles, far below the conventional limit.

Eddy current (EC) separation is a powerful and widely used technique to separate non-ferrous metals, which has become a standard for the recovery of raw materials in waste management industry. In an EC separator a magnetic rotor exerts a force on metal particles to effect the separation. However, available ECs are not able to efficiently separate metal particles in the few-mm range, preventing full access to the economic and ecological potential that lies within non-ferrous metal content of waste.

### TECHNOLOGY




Our setup overcomes the current size limit and allows for efficient separation of smallest non-ferrous metal particles below 1 mm based on four major innovations (see figure):

(i) Optimized particle flow direction through the magnetic field zone for maximum impact of the EC separation force.

(ii) Multiple interaction zones can be closely stacked.

(iii) A novel and highly efficient magnetic field geometry, inspired by particle accelerator technology, provides a significant increase of the magnetic field in the interaction zone.

(iv) Reduced particle velocities through deceleration or suspension in a fluid allow for a substantial increase of the exposure time to the separating force.

### ADVANTAGES

- Efficient separation of particles below 1 mm.
- The scalability of the setup in terms of the active magnetic field length and geometry of the separation zone allows for almost arbitrary adaption to the target particle size and material.
- Multiple parallel channels fully exploit the magnetic field region and allow for the highest possible throughput.
- No wear because no moving parts are in contact with the material feed.
- Further optimizations allow for a further reduction of the particle size limit.

### POTENTIAL FIELDS OF APPLICATION

- Urban mining / Waste management industry: Municipal solid waste incineration in Europe produces 20 million tons of bottom ash per year, with an estimated fraction of non-ferrous metals in the range of 5 %
- Extractive metallurgy

**Ref.no.: E_672**

**KEYWORDS:**
Eddy current separator
Waste management
Extractive metallurgy

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**COOPERATION OPTIONS:**
Licensing, Sale

**DEVELOPMENT STATUS:**
Prototype available

**STATUS OF PATENTS:**
AT: patent granted (AT518730B1)

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