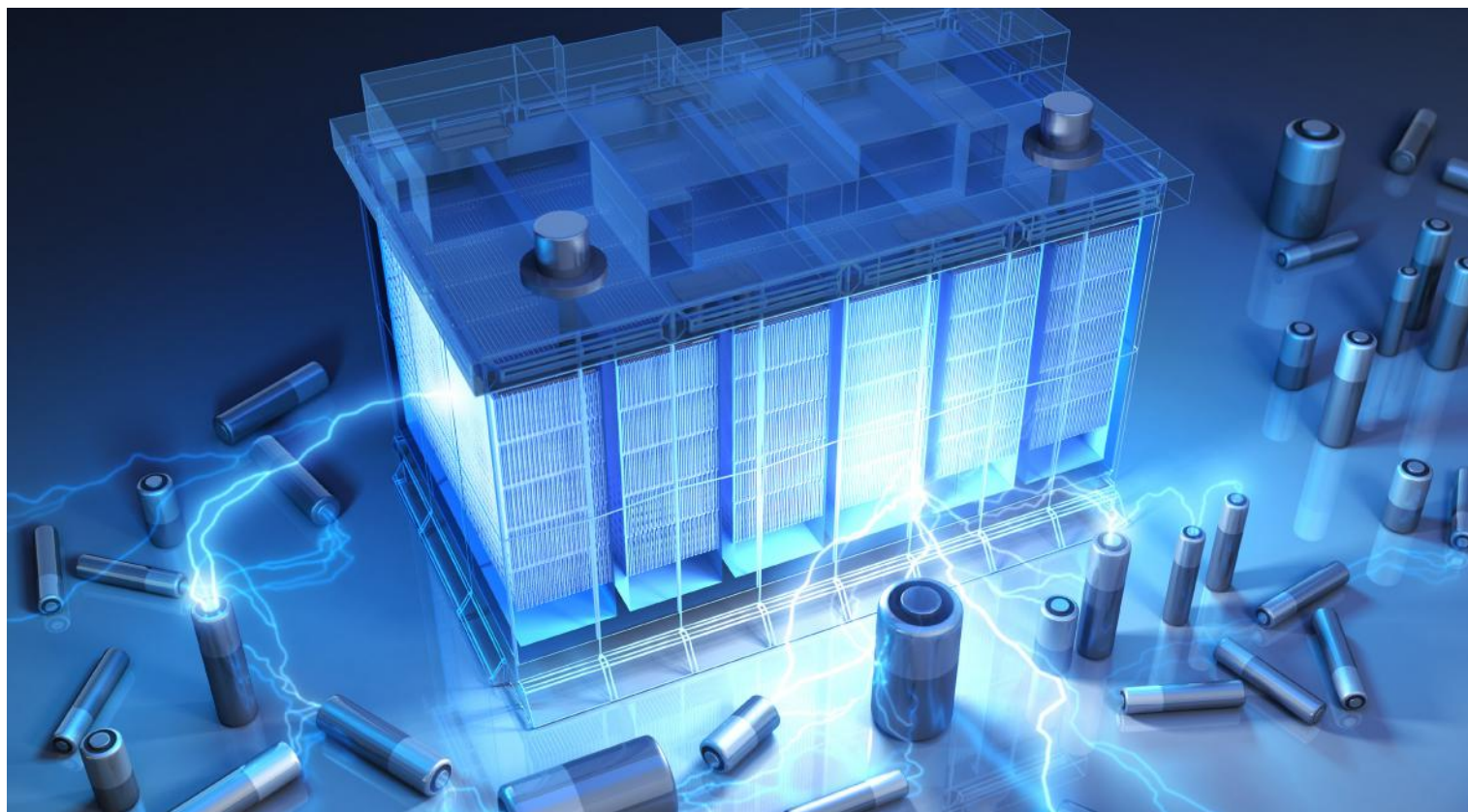




**ERDWICH**



... SHREDDING UNLIMITED ...

## LITHIUM-ION BATTERY RECYCLING WITH ERDWICH



# RAW JEWEL BATTERY MORE THAN JUST AN ENERGY STORAGE

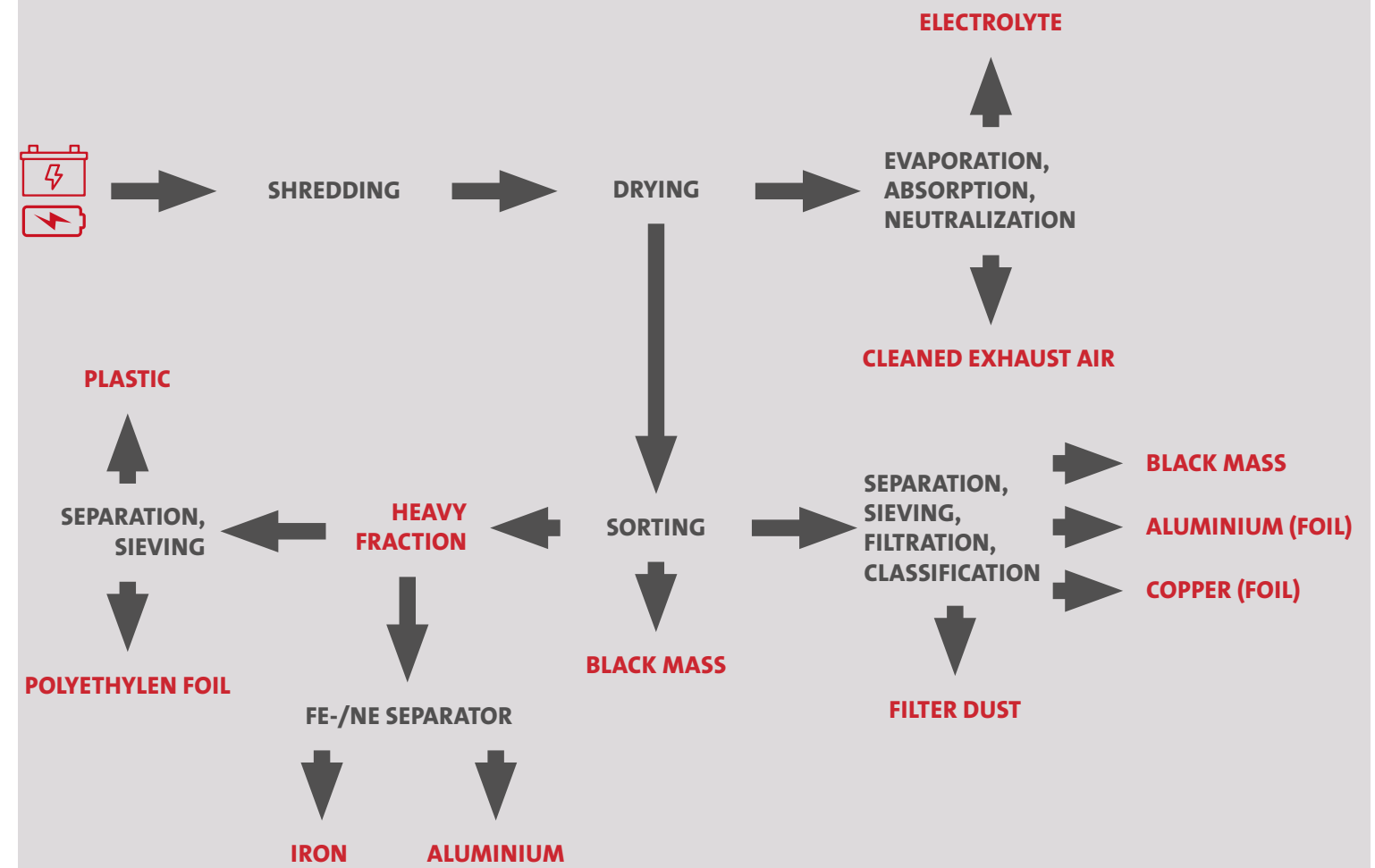
[www.erdwich.com](http://www.erdwich.com)

Made in   
Bavaria 

# FROM SCRAP TO RAW MATERIAL



# MAXIMUM RAW MATERIAL PROFIT



## Environmentally friendly recycling of lithium-ion batteries

It doesn't matter whether it's a laptop, mobile phone or vehicle - the need for batteries and rechargeable batteries is increasing. Lithium-ion batteries are an integral part of modern electronic devices. But the resources for this are short and their extraction with various ecological and social problems. In addition, however, the batteries only have a limited lifetime and have so far been difficult to recycle. But with the increasing relevance of batteries and rechargeable batteries, the requirements and challenges for recycling also increase.

An ecologically very attractive approach to recycling lithium-ion batteries is the largely mechanical processing of the batteries using crushing, Classification and sorting processes as well as the evaporation of the volatile electrolyte components. With our modern recycling process, you can efficiently recycle your old batteries, minimize risks and recover valuable raw materials such as copper, cobalt, manganese and lithium.

### ERDWICH – Recycling process – sustainable and safe

The recycling process consists of a number of different work steps such as unloading, mechanical shredding, drying and recondensation as well as various separation processes. Our recycling process maximizes the quantity and quality of material recovered, while minimizing the environmental impact of the process.

In the first step of discharging, the electrochemical energy remaining in the battery is reduced, thus minimizing the risk of thermal-chemical reactions. The material is then shred and dried. The drying process is followed by a number of mechanical separation steps such as air classification, shredding and screening. Products from this recycling process are: aluminium, plastics, copper and finally the black mass consisting of the coating materials of the electrodes.

**ERDWICH.**  
**Shredding unlimited.**

### Input material



LI-ION-BATTERY FOR ELECTRIC VEHICLE

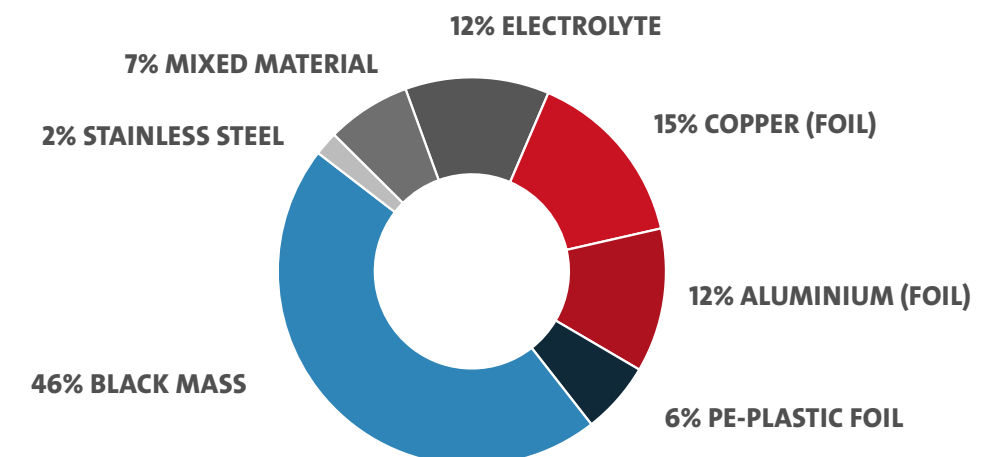


2.000 X 1.600 X 300 MM

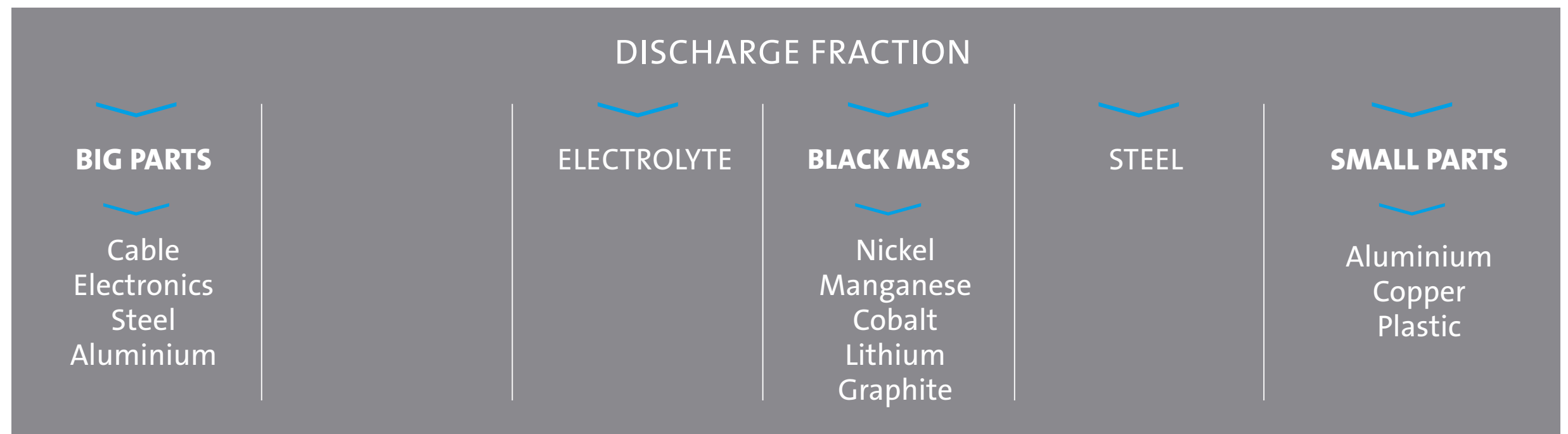
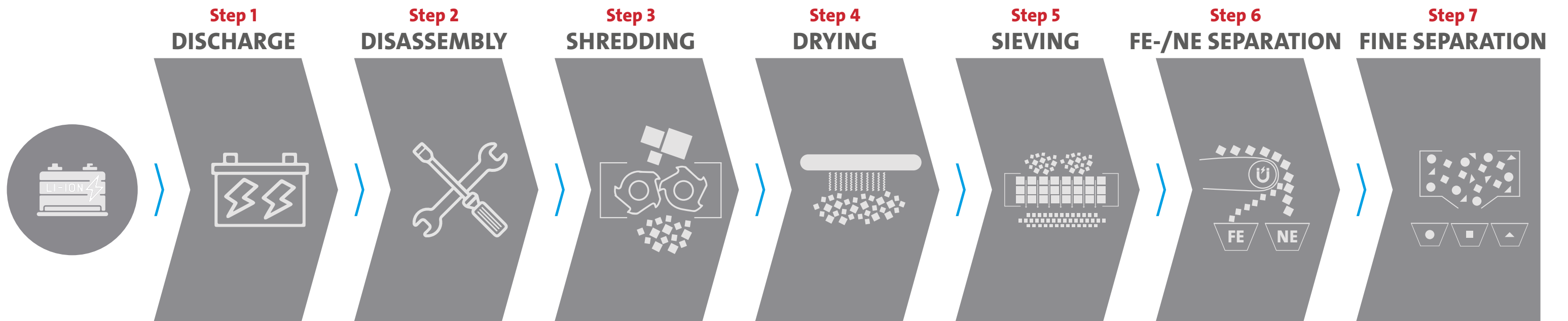


600 KG / UNIT WEIGHT

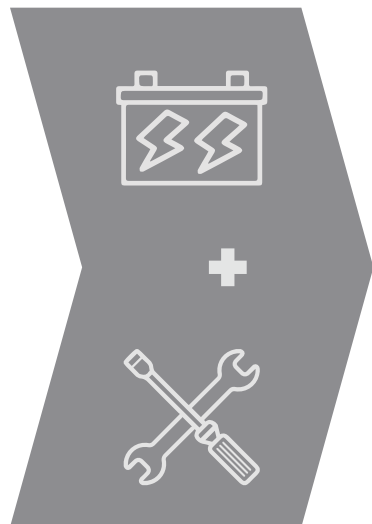
### Discharge fraction after recycling







**Step 1 + 2**  
**DISCHARGE / DISASSEMBLY**



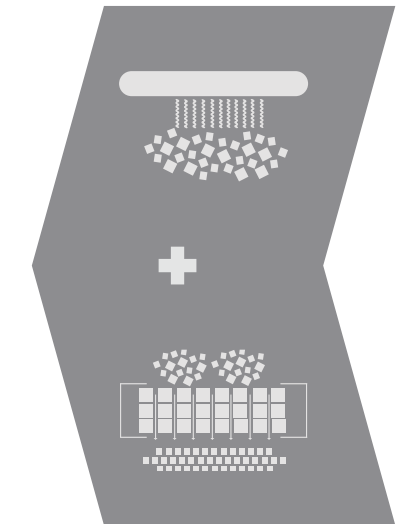
**Unloading and disassembly**

- Application of batteries and accumulators on lifting work tables
- Checking the batteries by a specialist for residual voltage and, if necessary, discharging the batteries with a suitable discharge device to a voltage of 0 volts (maximizing fire protection)
- Manual disconnection of cables and easily removable electrical components
- Transfer of the completely emptied and dismantled batteries via the roller table for the subsequent steps in the process

**Drying and sieving**

- Dehumidification takes place in a discontinuous operation
- An agitator prevents caking and promotes even drying of the material
- The dried shredded material is fed into an air separator to separate light and heavy material
- The light material consists largely of plastic and black mass and is stored in a buffer silo after being crushed again into the finest possible shredded material
- The heavy material is first fed via a vibrating chute to a magnetic drum for the separation of FE metals and then to an eddy current separator for the separation of non-ferrous metals

**Step 4 + 5**  
**DRYING / SIEVING**



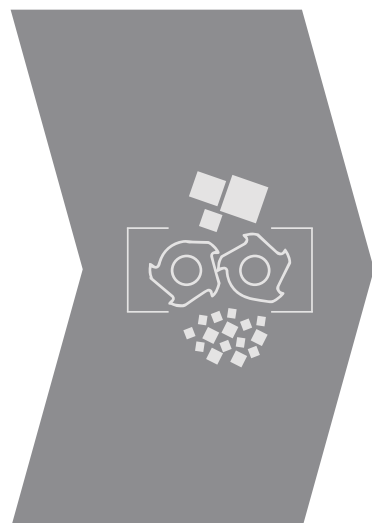
**Pre-shredding and separation**

- Feeding the batteries and accumulators via a sluice into the inert system
- Inerting takes place through nitrogen
- Plant operation from an oxygen content of < 3 % in the entire inerting system (monitoring by means of oxygen sensors)
- The first stage of shredding is carried out by a two-shaft shredder with an end piece size of 50 x 100-150 mm
- If necessary, the shredder can be flooded with water via an extinguishing system
- The material is then conveyed to a hammer mill for secondary shredding
- Size reduction of the material stream to a grain size of approx. 15 mm

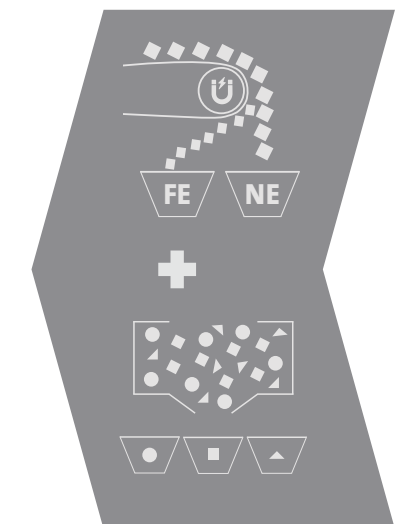
**Fine preparation and separation**

- The material is fed onto the screening machine
- The screened fine fraction consists of black mass (with a proportion of 50-80 %) and is filled into big bags
- The oversize material is separated into light and heavy material in a zigzag sifter
- The heavy material flow is collected in a trough below the plant
- The light material, on the other hand, is brought to a uniform corn size with a balling mill and divided into five fractions by a screening machine: the overflow consists of foils, the undersize consists of black mass and the three separation units consist of the fractions copper/aluminium, plastics and FE metals
- In an additional separation unit as a stand-alone solution, the resulting non-ferrous metal mixtures are separated into the fractions copper and aluminium

**Step 3**  
**SHREDDING**



**Step 6 + 7**  
**FE-/NE SEPARATION  
FINE SEPARATION**



**Further application:**

- E-waste
- Refrigerators
- Fuel surrogates
- Cardboard
- Hazardous waste
- and many more

**Core competences:**

- Shredding machines
- Plant engineering
- Service

**Innovation is our standard!**

As a highly specialized engineering and production company, ERDWICH offers exceptional services in recycling and shredder technology with over 30 years of experience. Shredding machines, special solutions, complete recycling systems and global service are our core competencies, which our team is enthusiastic about every day.

Owner-managed, with personal, intensive support, short response times and comprehensive service, we provide you with first-class quality made in Bavaria. Get to know us.

**WELCOME!**



Take your chance and test your material without obligation in the ERDWICH test center.

We look forward to seeing you.

**ERDWICH ZERKLEINERUNGS-SYSTEME GMBH**

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