



Advances in IBA Processing

- 100% REMEX daughter company
- one of the largest IBA processing plants in Europe (750 kt/y and growing)
- state-of-the-art metals recovery, cleaning and separation
- freely applicable mineral aggregates for construction and roadworks

HEROS | Overview

HEROS: Business areas and key facts



Mineral waste management



Mineral and metal processing



Secondary aggregate production

granova® Branded Quality



GRANUMIX
granova®



COMBIMIX
granova®



DRAINMIX
granova®



IMMOMIX
granova®



Company of the
REMEX | REMONDIS Group



Green Deal

Green Deal proof



Centrally based in Europe



Waste water purification plant

> 100
Employees



> 50 Mio. €
Turnover

Outstanding recycling technologies



TRIPLE M
Sieving technology



HMT
IBA washing facility



MERIT®
Metal recovery



METAL UPGRADE
Non-ferrous upgrade facility

Bottom ash processing of municipal solid waste stemming from > 7.000.000 people



Certified

VCA
ISO 9001
ISO 14001



> 70.000 t/a
Metal recovery



> 745.000 t/a
Secondary aggregates

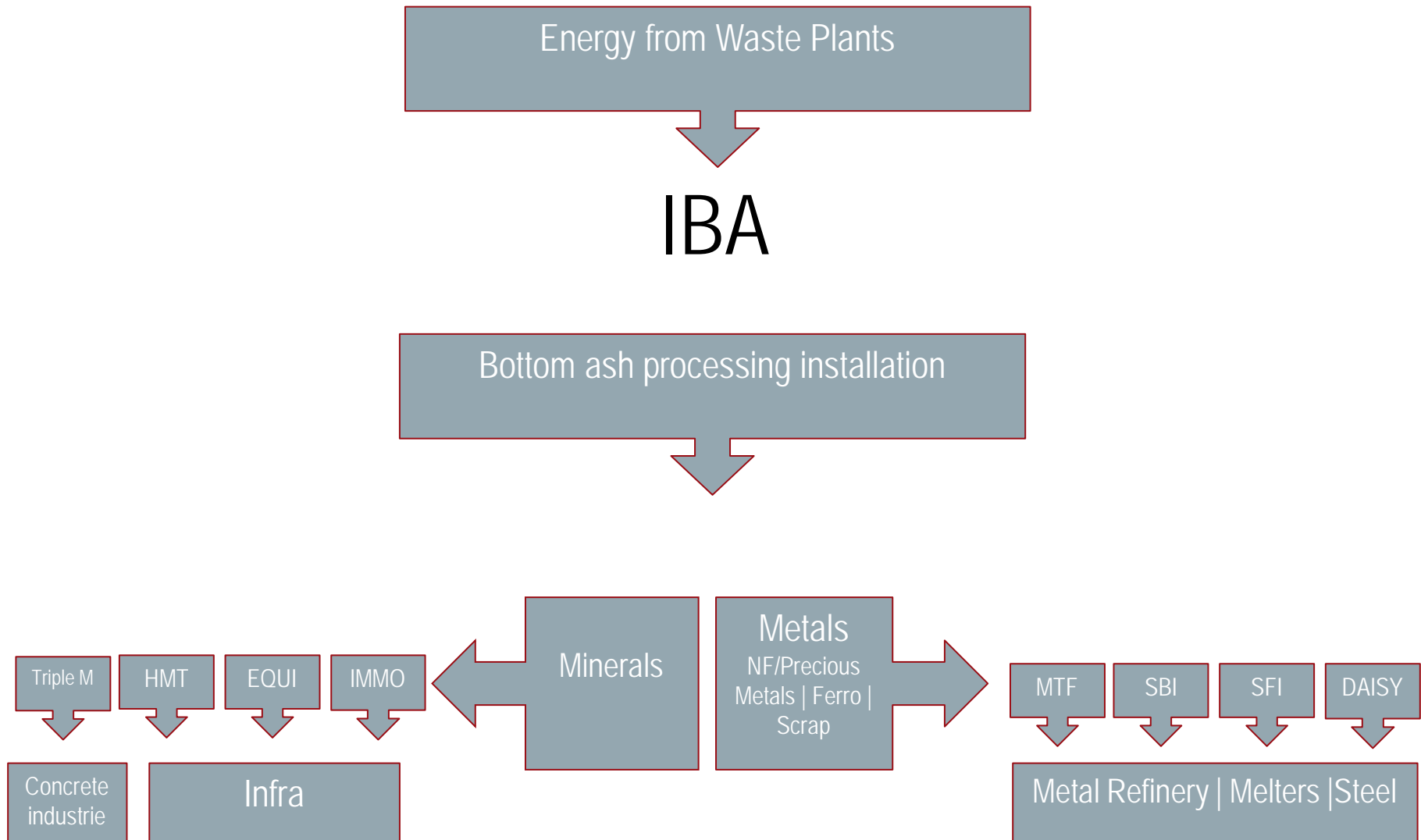
What is IBA?

- Minerals (80-90%) – glass, ceramics, melts, aggregates
- Iron (scrap) – some 5%
- Non-ferrous metals: Al, Cu, Zn, Pb, brass, Au, Ag, Pd...
- Unburnts (plastic, wood, textiles)

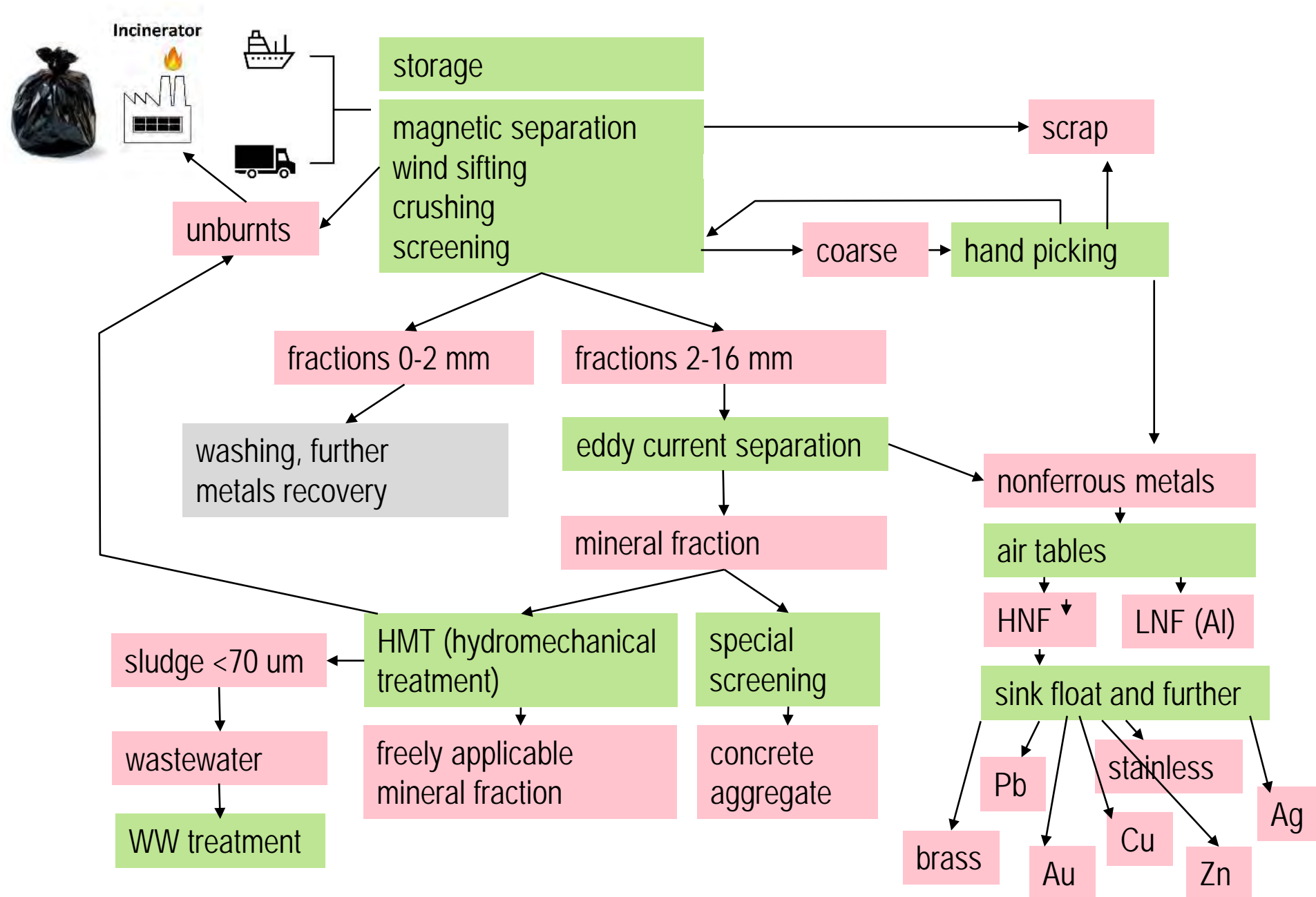
IBA processing - Goal

- To recycle and reuse all components
- Harvest metals in an optimized way and sell these to smelters
- Treat minerals to create a useful aggregate and sell it for civil engineering purposes

Facts & figures HEROS | value chain



Dry ash treatment: separation of metals and minerals



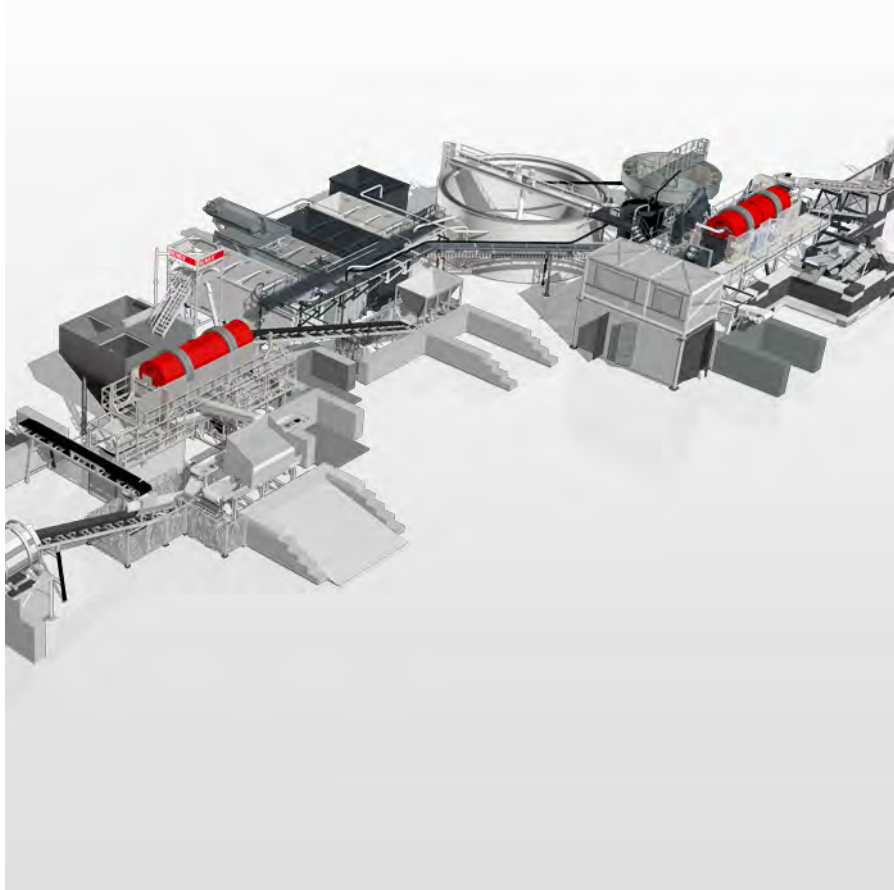
Mineral aggregates

- Valuable gravel/sand replacement
- But not freely applicable in environment
 - *metals and salts leaching*
- Cl, SO₄, Cu, Sb, Mo....
- Accelerated ripening with CO₂
- Washing
- Screening
- Immobilizing
- Additives

TECHNOLOGY OPTIONS

- Hydromechanical treatment (separation of gravel/sand and sludge);
- Equiash – accelerated ripening and slow washing (all cuts);
- immobilizing – surface covering and binding;
- chemical binding with additives;
- variations on these themes being tested.

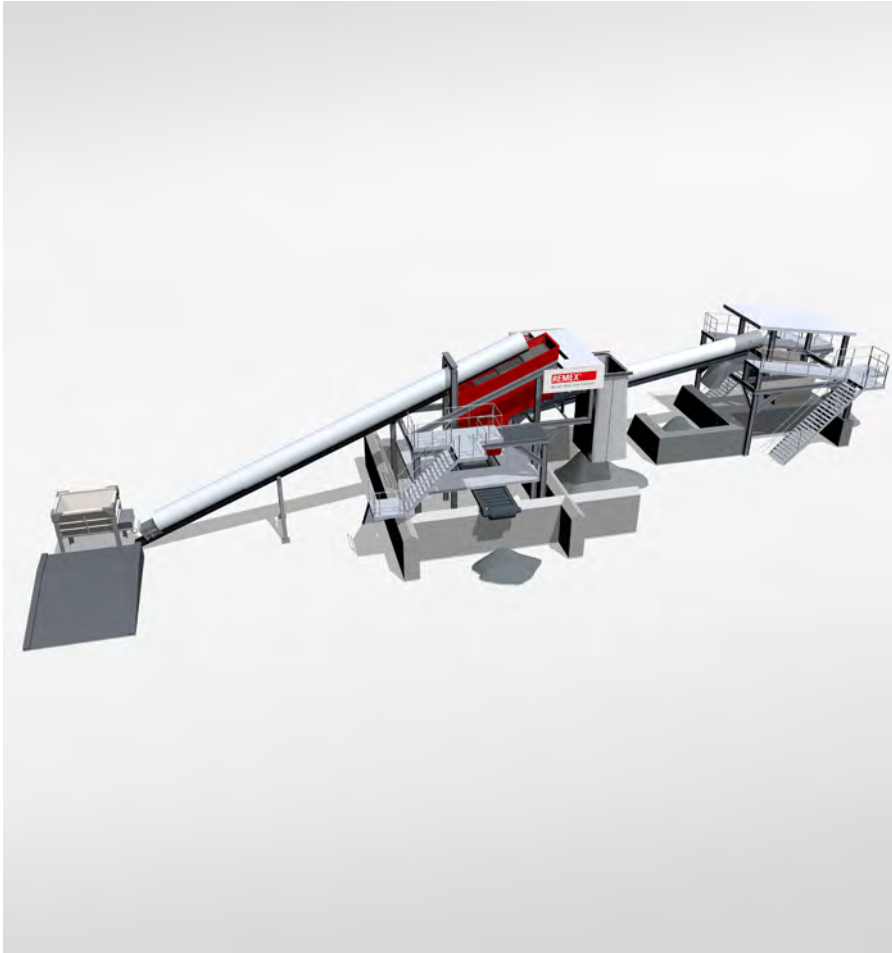
Minerals: HMT Hydro-Mechanical Treatment



- Special features of the HMT technology at our HEROS plant:
 - Two wash processes
 - Use of an additive
 - Water treatment and recycling
 - Capacity of 300,000 tonnes
 - Production of granova[®] combimix for use in road subbase, concrete and asphalt
 - additional NF metals recovery

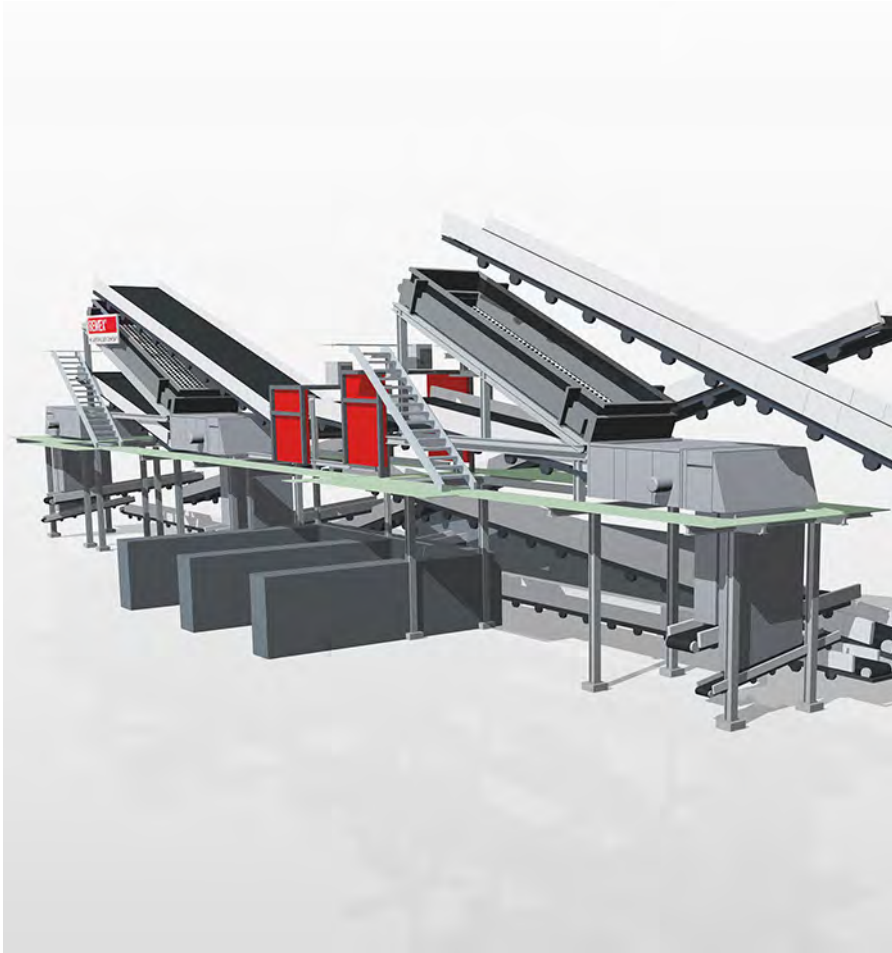
- Several modifications of the washing process are being tested
- E.g. keeping the fine fraction inside instead of washing it out

Minerals: TRIPLE M sieving technology



- TRIPLE M is a 3D sieving technology for incinerator bottom ash aggregates
- After the main treatment IBA material sized 2 to 12 mm is passed over a special sieve construction
- Magnetic and eddy-current separators remove any further ferrous and non-ferrous metals
- TRIPLE M improves the technical construction properties of IBA
- Result is granova[®] granulate for use in concrete

Metals: MERIT[®] for higher metal recovery



- MERIT[®]: optimum recovery of non-ferrous (NF) metals from incinerator bottom ash (IBA)
- Focus on the smaller fraction of NF metals (2-4 mm) often overseen by other recycling companies. This is about 15% of total NF content
- Internal technology development, being patented
- Ballistic principle with the aid of an air stream
- REMEX not only applies MERIT[®] in its own plants but also offers it as an individual module to the IBA processing industry
- Recycling companies can choose from different cooperation models

Metals: MTF Metal Treatment Facility



- NF metals from EC separation are mixed and contain 50- 80% mineral
- The metals are separated and cleaned in our Metal Treatment Facility (MTF) in the Netherlands.
- In a dry process, the NF metals are passed over several air tables.
- A combination of sieving, air stream and movement separates the metals into light and heavy metals.
- The result are high purity metal fractions, which can be directly used at the smelting plant.

Sink Float separation of heavy NF

- HNF contains Cu, Zn, brass, Pb, Sn, Au, Ag, Pd....
- this can be partially separated by gravity in a liquid, and sorting
- Heros acquired Dolphin in 2022, a company specialized in separating and purifying NF metals



Fe	Al	Cu	Zn	Pb	Ag	Au	brass	stain less
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MAGNETIC SEPARATION

Fe	Al	Cu	Zn	Pb	Ag	Au	brass	stain less
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EDDY CURRENT SEPARATION

Fe	Al	Cu	Zn	Pb	Ag	Au	brass	stain less
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AIR TABLE UPGRADING

Fe	Al	Cu	Zn	Pb	Ag	Au	brass	stain less
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SINK FLOAT, SENSORS, FURTHER TREATMENT

Fe	Al	Cu	Zn	Pb	Ag	Au	brass	stain less
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HEROS Products | Minerals

PRODUCTS



GRANUMIX | concrete



DRAINMIX | water management



COMBIMIX | Road foundations



HEROS Products | Minerals



HEROS Products | Metals

PRODUCTS



Scrap Metals

Stainless



Light Metals | Aluminium



Heavy Metals | Concentrate



Precious metals



Metals

Some challenges:

- EC separation of complicated shapes
- EC separation of stainless steel
- Agglomerates of NF and mineral
- Metals recovery from finest fractions
- Separate coin recovery



Solutions:

- special screens
- smart crushing
- dynamic wet gravity separation (jig)
- coin separators



Minerals

Some challenges

- Uses for finest fractions
- Sludge use, or prevention

Solutions

- Fines washing and conditioning
- Static washing modes
- Immobilisation
- Additives

Bottom ash in a non-ideal world

- Waste collection and separation is not perfect
- Issues end up at IBA processor
- Challenges and opportunities
- Electronics in household waste add to precious metals load
- Loose currency ends up in trash
- Flame retarded materials add to Sb and Br load
- More refined IBA treatment leads to minor, unusual streams needing tailor made solutions







Find us on:

www.heros.nl

www.remex-processing.de

Our YouTube channel: [HerosSluiskilBV](#)

Thank you very much for your attention.