

Mapping of footwear recycling

- Industrial stage
- R&D projects or trials in progress

PROJECT

Projects supported by Refashion within the Innovation Challenge

*SRF: Solid Recovered Fuel



DESIGN FOR REPAIR

Disassembly upper-sole + remanufacturing or sole recycling



Closed loop recycling (shredding-melting-injection)

→ Single-material footwear

HODEI



Industrial composting

→ Biodegradable materials that degrade when composted

2,500 pairs... of foam insoles allow one tennis court to be built

of rubber outsoles, 300m² of children's playgrounds

A vast majority of collected footwear can be reused



A small fraction of collected footwear cannot be reused and therefore must be recycled

Manual AND/OR automatical sorting of non-reusable footwear

SRF*, Energy recovery or incineration/landfilling

Shredding/ compressing

SHREDDING CHALLENGES:

- Limit intra-material pollution,
- Reduce and homogenize particle size

Complete shredding of footwear
Coarse shredding (about 2 cm²).
All types of footwear

Delamination then densimetric separation of materials

FOOTWEAR RECYCLING PILOT LINE

RUBBERS (NATURAL AND SYNTHETIC ELASTOMER), **FOAM, PVC, PU, ETC.** FROM SOLES
→ Hard or bouncing floorings, thick mats, outsoles

TRUCS-TROUVAILLES



Sorting then shredding into 3 types of granules: **RUBBER, FOAM AND FIBRES**
→ Flooring surfaces, outsoles



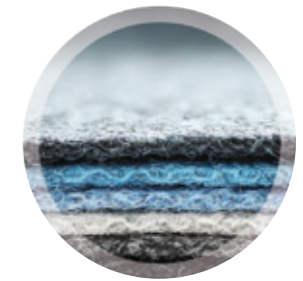
Models containing sorting disruptors:

- Toe caps (in metal or hard plastic) in safety footwear
- Heels in hard ABS plastic + shoe uppers in steel
- Parts which cannot be separated
- Electrical and/or electronic components



METALS
→ Existing metal recycling processes

TEXTILES (NATURAL AND SYNTHETIC MATERIALS)
→ SRF*, Energy recovery
→ Integration into nonwovens



REJECTS AND DUST PARTICLES
→ SRF*, Energy recovery



LEATHER / FAUX LEATHER
→ Shredded to be used as filler
→ Mixed with PVC to be used as filler
→ Mixed in with wood fibres to produce acoustic panels
→ Integration into compressed wood panels
→ Thermal recovery



THERMICUIR

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