

➔ **Staff safety and site protection: an ongoing priority**

The safety of the staff and the protection of the site and its surroundings are major concerns for Recyfuel, reflected in a wide range of constantly upgraded measures on a daily basis.

Staff safety

Safety begins with training: all the staff have the qualifications required to carry out their duties and attend regular training programmes to maintain, deepen and diversify their skills. Good practices are duly complied with, e.g. wearing personal protective equipment, handling operations from closed and glazed control rooms, targeted medical examinations by the industrial physician, "safety quarter of an hour" by the prevention adviser, etc.

Site protection

Elimination of fire risks and chemical incidents receives the company's undivided attention: the site is compartmentalised into zones, waste and absorbents are unloaded in sealed chambers fitted with a suction system to limit the emission of odours and dust, facilities are equipped with foam guns and sluice valves to seal or to ventilate the building, one-way circulation of trucks on the entire site, etc.

➔ **The environment: preserve the air, water and soil**

A responsible company by the very nature of its activity, Recyfuel takes all the necessary measures to protect its environment. For instance, all installations are closed and are equipped with highly sophisticated suction and odour treatment devices. A regenerative thermal oxidiser (RTO) that can operate at more than 800°C in particular destroys all odorous molecules and provides purified air to the atmosphere.

On the ground, the factory is equipped with a double sealed slab that averts any and all risks of percolation.

Waste waters are collected and are run through an oil/water interceptor before they are discharged.



➔ www.recyfuel.be

RECYFUEL S.A.

Zoning Industriel d'Ehein
B-4480 ENGIS
BELGIUM

Telephone : + 32 4 273 99 70
Fax : + 32 4 275 15 09
E-mail : info@recyfuel.be

GPS address: Rue du Parc Industriel



For more information ➔ www.recyfuel.be



www.recyfuel.be

THE EXPERTISE OF VALORISATION

Recyfuel is a platform for the pre-treatment of hazardous industrial and special household waste to produce a substitution solid fuel used in cement plant kilns.

➔ Three types of products

Waste treated by Recyfuel is turned into 3 products ready to be recovered or recycled:

- **Resofuel**, impregnated wood sawdust with a particle size of less than 10 mm
- **Mix**, composed of plastic, wood and textiles, with a particle size of less than 40 mm
- **Metal**

Resofuel and Mix are replacement fuels obtained by grinding and mixing waste with wood sawdust. They are recovered in cement kilns.

Metal is recycled in the steel industry as scrap.



What does pre-treatment actually mean?

Pre-treatment refers to the treatment phases during which waste is prepared for reuse.

What is waste?

Waste refers to any material or object got rid of by its holder, voluntarily or by obligation. Waste arises from industrial, commercial or household sources.

What is hazardous waste?

Hazardous waste is waste that poses a specific danger for humans and the environment based on certain criteria defined by law. This hazardous aspect is due to the fact that:

- It is composed of one or more hazardous constituents in a given concentration
- It has one or more characteristics and dangers listed in the relevant legislation

➔ Recognised know-how and expertise

Recyfuel was created in 1986 at the end of the second oil shock. In 1999 CBR (cement plants – HeidelbergCement Group) and SITA (waste management – Suez Environment) became the sole shareholders on an equal basis.

Recyfuel has mastered the art of waste pre-treatment for more than 20 years. Quality, safety and environment are at the heart of its daily concerns. The company is keen to strictly comply with its commitments by constantly improving its procedures and through regular communication with all stakeholders.

Some key figures:

- Around 85,000 tonnes of waste are treated annually
- 100,000 tonnes of Resofuel, 18,000 tonnes of Mix and 7,000 tonnes of metal are produced every year on average
- 30% of the workforce is assigned to the laboratory and to quality control tasks



WHEN WASTE BECOMES FUEL

Co-incineration is an operation whereby waste is reused by recovering its energy and/or mineral content.

A **replacement fuel** is a product with an attractive calorific value that can replace to advantage a fossil fuel such as coal or gas.



Liquid or solid, in bulk or in most types of packaging, a great deal of waste is generated from household use in the bathroom, kitchen, garage or in residential building materials.



Diversity of treated waste

Recyfuel produces physically and chemically homogeneous replacement fuels from physically and chemically heterogeneous dangerous waste.

Hazardous industrial and special household waste treated by Recyfuel varies in nature, physical appearance or packaging. The most frequent (the list is not exhaustive) are:

- Paints, ink, glue, resins
- Oil sludge, tar, grease
- Soaps, detergents, cosmetics
- Petrochemical products
- Residues from the chemical industry
- Packagings and polluted materials of all sorts

Waste used in the Recyfuel manufacturing process comes mainly from Belgium, but also from France, the Netherlands, Germany, the Grand Duchy of Luxembourg, Italy, Ireland, Spain and the United Kingdom.

➔ A value chain with many advantages

Recyfuel is the indispensable link between the authorised waste collector and the user of a recoverable product. The company provides a real service to the community.

Upstream (waste collection)

- A complete ecological alternative to waste incineration or disposal on land. It is clearly ahead in the hierarchy of treatment options.



Downstream (recovery in cement plants)

- Conservation of natural resources by saving precious and non-renewable fuel such as coal
**2.5 tons of Resofuel
= 1 equivalent ton of petroleum**
- Process that enables 100% recovery and generates no residue
- Reduction of CO₂ emissions by saving double combustion (waste in incineration and fuel in the cement plants)
- Exclusively mechanical waste treatment without chemical additives
- A fuel that in no way alters the quality of the clinker, the raw material for the production of cement

SIMPLE, CLEAN AND EFFICIENT



The waste pre-treatment process designed by Recyfuel is simple, clean and efficient:

- **Simple**, because it comes down to shredding waste and mixing it with wood sawdust. Everything is exclusively based on physical treatment
- **Clean**, because it uses no other chemical additive and because it respects the environment
- **Efficient**, because it generates quality products safely that do not leave any residue when prepared or used



➔ Quality control throughout the entire process

No waste is used for production and no product is sent to the cement plants before getting the green light from the internal quality control laboratory. Before, during and after the treatment process, Recyfuel carries out compliance inspections, whether internal inspections imposed by the permit authorities or official external inspections.

Before acceptance: preliminary acceptance procedure to verify whether the waste meets the permit requirements and is compatible with the treatment process.

Upon acceptance: inspection of the safety parameters for the staff and for use, and verification of the criteria set in the permit.

Upon sending: physical and chemical analysis of each batch to verify compliance with the regulatory requirements of the "recovery authority." Each sample is kept in a sealed container for at least 6 months at the disposal of the authorities.

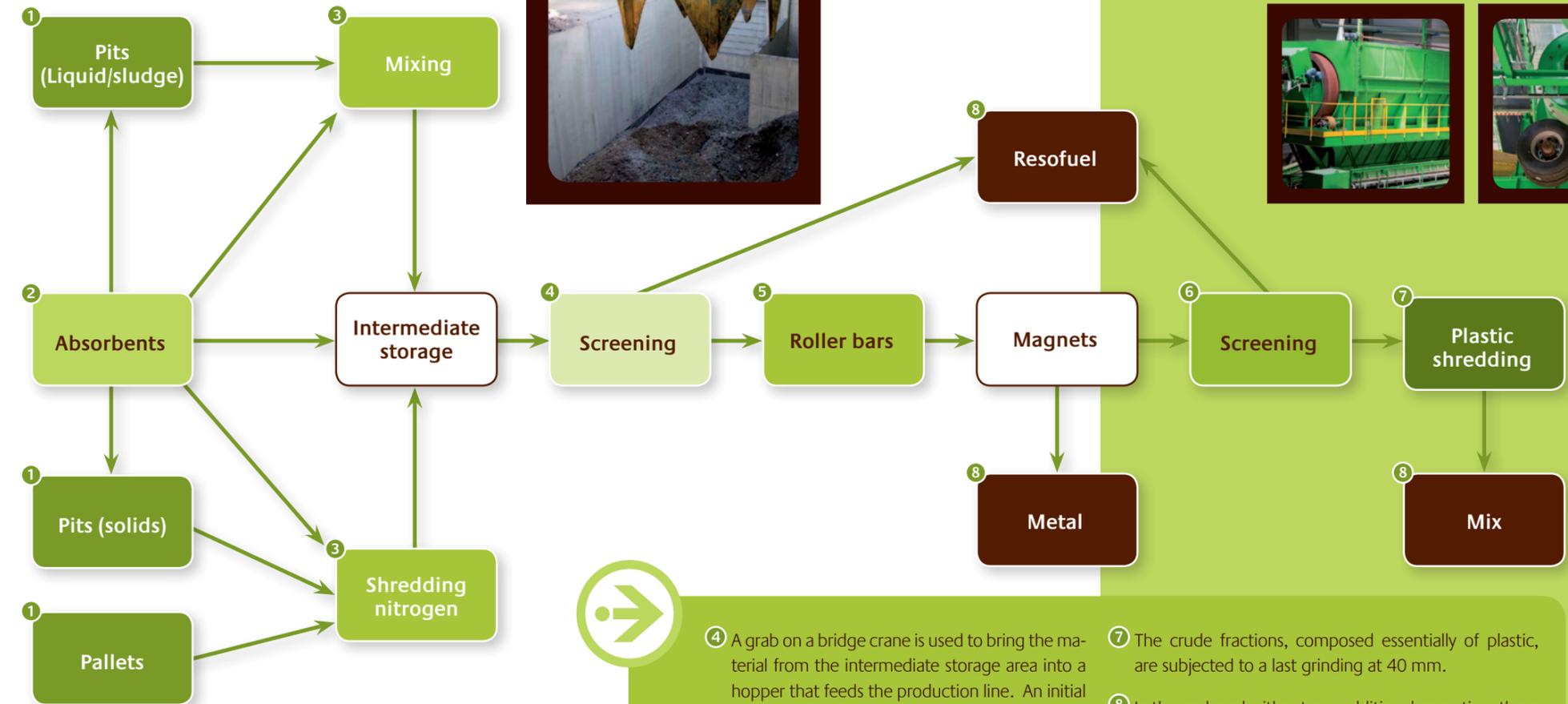
Official inspections: unannounced inspections of the stored samples four times a year by an authorised independent laboratory.

PRE-TREATMENT, STEP BY STEP



- ① Unloading of waste in pits (for sludge/liquids or solids) or on pallets.
- ② Mixing with an absorbent using a grab on a bridge crane. The absorbent is essentially wood sawdust and when possible other products with absorbing properties. In any event, the products used come from industry and public collections or production residues.
- ③ Sludge and liquids are injected in a mixer and solid products are crushed. Flows from the mixer and the crusher are brought together again in an intermediate storage area where they are pre-homogenised.

The absorbents are emptied in two pits with a total volume of 1,000 m³. They are then put in closed silos that supply the entire plant through conveyor belts.



- ④ A grab on a bridge crane is used to bring the material from the intermediate storage area into a hopper that feeds the production line. An initial sieve separates the fine from the crude fraction. The fine fraction is stored separately to await quality control inspection.
- ⑤ The crude fraction is sent to the roller bars that reduce the granules and mechanically clean plastic and metal.
- ⑥ A second sieve separates again the fine from the crude fractions.
- ⑦ The crude fractions, composed essentially of plastic, are subjected to a last grinding at 40 mm.
- ⑧ In the end, and without any additional operation, three products are ready to be recovered/recycled:
 - The finest part is sent to the Resofuel storage
 - The crude fraction is sent to the Mix storage
 - The metal is stored in bulk.

