

Collection of carpet tiles for closed loop recycling through manufacturer take-back scheme

In 2012 Desso collected over 100,000m² of post-consumer carpet tiles in the UK at the end of their life through their Take Back™ programme. The Open University has used the programme since 2009, diverting over 15,000m² of carpet tiles from UK landfill in the last three years



DESSO's Take Back™ programme provides businesses with a cost effective alternative to landfill

This is an example of the collection of commercial post-consumer carpet tiles through take-back. The Open University, one of many clients, purchases Desso products for all its refurbishments, as well as using their Take Back™ programme to dispose of the uplifted carpets responsibly.

Key facts

- Organisation: DESSO BV
- Type of business: Carpet manufacturer
- Location: Abingdon and London, England – Head quarter in Waalwijk, the Netherlands
- Type of non-textile: Post consumer carpet tiles from commercial sources
- Type of collection: Third-party collection from businesses on a project basis
- Tonnes collected per year in UK (2012): over 400 tonnes
- Re-use rate in UK (2012): 20%
- Recycling rate in UK (2012): 50%
- Secondary fuel rate in UK (2012): 30%

Introduction and background

Desso is a European flooring manufacturer which first originated in the Netherlands and Belgium in 1930. It started trading under the brand name DESSO® in the early 1950s. The company is a leading manufacturer of high quality carpet tiles, broadloom and artificial grass pitches.

Funding from the European Commission's Competitiveness and Innovation Programme in 2010 allowed Desso to launch its Take Back™ programme in the UK, France, Germany, Belgium, the Netherlands and Luxembourg. In line with their closed loop philosophy, Desso now offers an international collection service for end of life flooring on a project basis. This includes all types and brands of carpet and carpet tiles, with the exception of carpets containing PVC.

An increasing amount has been collected each year in the UK, from 156 tonnes in 2010 to 288 tonnes in 2011 and 401 tonnes in 2012. Desso expects to collect approximately 600 tonnes of product in the UK in 2013. Desso's goal is to collect 50,000 tonnes of post-consumer carpet via the DESSO Take Back™ programme worldwide by 2020.

Description of the operation

The Open University has been using Desso products for the last 16 years, and has specified the use of Desso's first Cradle to Cradle® carpet tile¹, Pallas, on all its floors since 2011. In the same year the Open University started working with Hi-Tech Flooring for capital projects, minor works and their rolling maintenance programme. The Open University places orders of new carpet tiles with DESSO, who deliver the tiles to Hi-Tech Flooring's facilities. Hi-Tech Flooring uses its own fleet of 3.5 tonne vans to transport the carpet tiles to the relevant Open University site.

Deliveries are coordinated to allow the old uplifted tiles to be returned to the Hi-Tech Flooring warehouse using the same vehicle. Once transported to the warehouse whole tiles are bulked up and stacked onto pallets or contained in pallet bags. Hi-Tech Flooring keeps 2,000 m² of the Open University's spare tiles stocked at their warehouse, allowing them to do patching work at the Open University as necessary. Since the start of the partnership the Open

¹ *Cradle to Cradle® products have been designed to be easy to disassemble so the component parts can be recycled into new products.*

University has restricted the colours it uses to blue and red tiles, allowing for more flexible maintenance. Having deliveries and collections of tiles to their warehouse allows Hi-Tech Flooring to bulk up tiles before collection by Desso, allowing for more to be collected at once.

The carpet tiles are collected on request, usually within 72 hours, by Desso’s haulage partner using a whole range of vehicles, from 3.5 tonne vans to 40 tonne articulated lorries. In order to streamline the system, Desso specifies that uplifted full carpet tiles must be palletised and shrink wrapped, while offcuts can be collected in pallet bags. These are then collected by Desso from £55 per pallet or pallet bag if they are being replaced by Desso products. All carpet tiles are accepted by the DESSO Take Back™ programme irrespective of the manufacturer (except tiles containing PVC). Desso’s specific instructions help streamline the process: it is essential that materials are made available for collection in an area protected from weather which is accessible to large vehicles on solid ground.

To maximise efficiency the same vehicles are used to carry out the delivery of new Desso products and the collection of materials for the Take Back™ programme around the country. All materials are bulked at Desso’s haulage partner’s facilities in Lancashire or Oxfordshire before being sent on to Desso’s facility in Waalwijk, Netherlands. Backhauling is used to transport materials back to the Netherlands, making use of delivery vehicles which would otherwise have been returning empty.



All tiles are diverted from landfill through three different streams (see diagram above). The end fate is dictated by market forces and material type availability.

- The best quality carpet tiles (20%) are cleaned and re-used as carpet tiles.
- Half are prepared for recycling through the Refinity® plant, using Desso’s innovative separation technique. Refinity® allows the yarn and other fibres to be separated from the backing, producing two main material streams for recycling. The recovered yarn is sent on to Slovenia where Aquafil, one of Desso’s yarn suppliers, converts it back into new nylon fibres for the manufacture of ECONYL® yarn, which is made from 100% regenerated nylon including post-consumer yarn waste from Desso’s Refinity® plant. Currently the most common backing is a bitumen one. This carpet tile backing is recycled into products for the road and roofing industries.
- The remaining 30% of the material collected in the UK which is not suitable for recycling is recovered as secondary fuel in cement kilns.
- A full audit trail is provided to the customer for all paths. For carpet tile products with Desso’s EcoBase™ backing, the polyolefin based layer of this backing fully recyclable in Desso’s own production process.

Performance/outcomes 2012

- Number of collections/deliveries: 220 collections

- Non clothing textiles collected: over 400 tonnes
- Re-use rate: 20%
- Recycling rate: 50%
- Secondary fuel rate: 30%

Figure 1 The Open University's stock of carpet tiles for patching.



Innovation/good practice

By collecting used products for recycling, Desso is sourcing materials and working towards a closed loop recycling system. They have developed an efficient system to capture these materials through the DESSO Take Back™ programme, as well as developing equipment to process these materials through their Refinity® plant. Nylon recovered through this process is sent on to one of Desso's yarn suppliers Aquafil, where it is recycled into ECONYL® yarn. Over 50%² of Desso's range of carpet tiles contains ECONYL® yarn, forming an efficient closed loop recycling system.

Description of costs and revenues

A summary of the main estimated costs and revenues (detail given where provided).

Costs:

- Collection: The majority of tiles are collected by DESSO's national haulage partner using a range of vehicles, from 3.5 tonne vans to 40 tonne articulated lorries.
- Buildings: DESSO's haulage partner also handles storage. A warehouse space is needed to store the product and bulk it up for more efficient transport.
- Equipment: An electric forklift is necessary to load pallets.
- Investment in Refinity plant.

Revenues:

- Income from sale of products
- Collection fees: £55 per pallet/pallet bag
- EU subsidy from Eco- innovation funding scheme

² 50% relates to the 2012 sales volume of products available with ECONYL® yarn in the commercial carpet tile collection. The total % of recycled content varies per product and per colour.

Figure 2 Carpet tiles being bulked a Hi-Tech Flooring before collection



Conclusions/key learning points

Desso has demonstrated a shift towards a circular economy through Cradle to Cradle® design. The development of the Refinity® separation technique has allowed them to separate the yarn and other fibres from the backing, producing two main material streams which can be recycled. By establishing the Take Back™ programme it ensures recycling takes place according to the Cradle to Cradle® principles by collecting their end of life products from their clients themselves.

Palletising and bulking carpet tiles at each stage of the collection chain helps Desso to collect used carpet tiles as efficiently as possible. The use of existing delivery vehicles at every stage allows for goods to be backhauled, minimising environmental impact and maximising transport efficiency. With the Take Back™ programme, Desso offers its customers an alternative to landfill, enabling them to responsibly dispose of their flooring waste without excessively increasing their spend.

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