

Refurbishment Resource Efficiency Products Case Study: Carpets, Desso

Cradle to Cradle approach leads the way in carpet tile recycling

This case study focuses on Desso, a leading European designer and manufacturer of carpet tiles, broadloom carpets, and highlights the overarching approach that it is taking to address and integrate resource efficient manufacturing processes within its business.

Business benefits

- Cradle to Cradle® strategy adds significantly to the bottom line i.e. normalised Earnings Before Interest & Tax (EBIT ratio) up from 1% in 2006 to over 9% in 2010.
- 28% energy reduction per carpet tile produced from 2002-2010.

Manufacturer description

Operating in 110 countries including the UK, Desso is a leading player in the design and development of carpet tiles and broadloom for both business and consumer markets. Desso's innovation strategy is concentrated in three key areas: Creativity, Functionality and Cradle to Cradle®.

In 2008, Desso signed a partnership agreement with the Hamburg-based Environmental Protection Encouragement Agency (EPEA) to become the first carpet manufacturer in Europe, Middle East and Africa (EMEA) to adopt the Cradle to Cradle® design concept and embrace this philosophy into its business culture.

Cradle to Cradle® takes its inspiration from nature; where recycling is universal and everything is reborn again and again in a perpetual cycle of re-use. Products must be better-designed for easy disassembly and use positively-defined¹) materials which can be recycled. Desso aims to have all its products designed according to the Cradle to Cradle® philosophy by 2020 and to run fully on renewable energy.



Desso Airmaster at Staplehill School

Materials quantity – minimising resource impact

Sustainable power sources include 100% renewable electricity (hydropower) at Desso's production plants in the Netherlands and Belgium – with the latter also generating power from 23,000 m² solar panels. All forklift trucks at Waalwijk are electric and emission-free, being quiet and cost-effective.

In its Refinity® plant, yarn and other fibres are separated from the backing, producing two main material streams for recycling. After an additional purification stage, carpet fibres are re-used by yarn manufacturers in new yarn. Some virgin material is needed to compensate for losses and process inefficiency.

Benefits/savings

- 28% reduction in energy consumption per carpet tile produced from 2002- 2010 for carpet tiles produced at Waalwijk, Netherlands.
- 43% reduction in CO² emissions at all production locations from 2007-2011 - 100% renewable electricity used since 2011.
- 60% of commercial carpet tiles contain Econyl® yarn, which is made from 100% recycled content by colour.

Materials wastage

Significant investment in raw material assessment has led Desso to seek new ways of designing products using positively- defined materials. Desso also persuaded most of its suppliers to help it achieve Cradle to Cradle® milestones. Suppliers have to declare the ingredients of their raw materials.

More than 26 different kinds of waste are collected for recycling. Waste recycling from Desso's factories exceeds 95%. All packaging is 100% recyclable. In 2010 Desso was the first manufacturer to achieve, via EPEA, a Cradle to Cradle® Silver certification for an entire polyamide carpet tile with Desso Ecobase® backing. Ecobase is 100% safely recyclable by Desso and is offered as standard on seven carpet tile ranges and optional on many more.

Benefits/savings

- 100% textile waste recycling rate at Desso's production plants.
- Random or directional tile laying cuts installation waste to 3% & 5% versus 8% to 15% on broadloom.

Recycled content

Desso's Take Back™ programme collects all types of used carpet, except those containing PVC. Carpets are recycled using Desso's innovative separation technique, Refinity®, which separates the yarn and other fibres from the backing, producing two main material streams for recycling. Polyamide yarn is converted back to the basic material and manufactured into new yarn. Carpet tile bitumen backing is re-used in the road and roofing industries.

Benefits/savings

- 100% of materials and process inputs from renewable or recycled sources by 2020.
- Soundmaster® (acoustic) backing has 80% recycled PET - optional on most commercial carpet tiles.

- Polyester (PET) primary and secondary backing layers have recycled content.



Refinity® Plant

Cradle to Cradle® views carbon as a raw material; a concept that helps to positively influence global climate change by recycling products. Desso's goal is to change a negative impact into a positive impact.

Cradle to Cradle® is an innovative design philosophy in which products are designed for disassembly and recycling - focusing on creating products which contribute to people's health, wellness and wellbeing. In response to indoor air quality concerns, Desso developed AirMaster® - a carpet tile that reduces the fine dust concentration in the air by 8 times³ more than hard flooring solutions, improving indoor air quality according to WHO⁴ requirements.

Benefits/savings

- 90% of the Polyamide (PA) carpet tile collection is Cradle to Cradle® certified, meaning that all its materials have been assessed according to the Cradle to Cradle® certification criteria.⁵
- Carpet tiles with DESSO EcoBase® are Cradle to Cradle® Silver-certified - 97% of all used materials are positively defined.¹

Water use

Desso biologically purifies 100% of its waste water in Dendermonde, where 70% is additionally purified with ozone. This special ozone treatment saves 38 million litres of fresh drinking water per year.

Life span – Design for appropriate durability/expected life

All carpet tiles have a 5 or 10 year warranty in commercial premises depending on raw materials used, plus density and weight of pile yarns. Purchasers have a choice for end-use based on wear classification under EN1307 class 32 or 33.

Often, for design reasons, carpets are only on the floor between 7 and 10 years. Which materials are used in carpets today determines how they can be recovered tomorrow. Desso's Take Back™ programme and Refinity® separation technique are helping to reduce the need for virgin materials.

Benefits/savings

- Products beneficial to humans and the environment.
- Closing the loop by using 100% recycled content, such as post-consumer yarn waste.

End of life potential

Desso's Take Back™ programme recycles used tiles from any source except PVC-backed tiles. By sourcing positively defined²) raw materials, introducing new manufacturing methods and collecting used carpets from clients, Desso is striving towards a closed loop process and has developed equipment to process more than 3,000 tonnes of carpet material every year.

Desso is a high-profile member of Carpet Recycling UK, the industry-backed organisation that actively supports carpet recycling.

Benefits/savings

- Third sector organisations benefit from tile re-use before eventual material recovery.
- Recycling reduces need for virgin raw materials.



Refinity® Plant Output

Business models that adopt the 'cradle to cradle' product lifecycle including recycling of old carpets

The Take Back™ programme was a key pre-requisite in the refurbishment of Wales & West Utilities Headquarters in Newport, South Wales where Desso supplied 3,600m² of new Freestyle carpet tiles. Old carpet tiles were collected, cleaned and reused in other local projects. ALC Contracts worked with project manager Carillion Property Services and Desso in a team effort to complete the contract a week ahead of schedule.

"Cradle to Cradle® is at the heart of our business and Take Back® is another step forward in our commitment to protecting the environment. Reuse of these old tiles admirably demonstrated this approach."

Keith Hall, Technical Director at Desso

Quest Diagnostics

At Quest Diagnostics in Hounslow, Desso supplied 1,410m² of Stratos carpet tiles (Basic C2C certificate) and recycled all the uplifted Nylon 6 pile bitumen-backed material through the Refinity® process. Carpet fibres went to Aquafil for new fibre production and the bitumen into road surfacing.

Vince Taylor, Managing Director of main flooring contractor Monmouthshire-based Kinetic Workplace Design, commented: "The environmental aspects of Take Back® appealed to all parties in this project. It also made complete financial sense - saving 40% on skip hire costs and landfill charges. Desso timed deliveries of new carpet tiles with collecting uplifted material for recycling. I will be actively promoting Take Back™ as it's well worth doing."

WRAP

Desso's Take Back® scheme met WRAP's specification for new flooring at its Horsefair offices in Banbury. High Wycombe-based fit – out and flooring contractor Boyce Business Interiors replaced 180 m² of old Bitumen Back carpet tiles with new tiles containing yarn made from 100% recycled content.

John Astins, Boyce Sales Director, said: "This scheme is a good way forward; fitting in with WRAP's requirements and enabling us to dispose of old carpet tiles responsibly at a comparable cost to that for landfill."

Benefits/savings

- Desso manages material recovery and certification of Take Back and recycling process.
- Sustainable approach helps win business.
- Increases recovery of valuable raw materials.

Conclusion

Desso's on-going Cradle to Cradle® achievements across all its product lines demonstrate that firms can develop successful business strategies to the wider benefit of the environment and of society.

1) Positively defined = all ingredients have been assessed as either Green (optimal) or Yellow (tolerable) according to the Cradle to Cradle® assessment criteria

2) 60% relates to the sales volume of products with Econyl® yarn in the commercial carpet tile collection. The total % of recycled content varies per product and per colour.

3) Based on tests performed by GUI, with DESSO AirMaster® versus standard PVC hardfloor.

4) World Health Organization Air quality guidelines for particulate matter, global update 2005.

5) Cradle to Cradle® Certification Program Version 2.1.1, prepared by MBDC September 2008, updated January 2010.

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