

Rewards

From carpets to car parts: Marplex uses carpet waste to create automotive plastics

Marplex, one of Australia's largest manufacturers of thermoplastics for automotive, whitegood, electrical, building and medical markets, has achieved major advances in sustainability by successfully sourcing and converting nylon carpet waste into polymer products which can be used for motor vehicle components.

The company's desire to achieve a step change in their process and materials and demonstrate to Australian industry the feasibility of reusing plastic in large scale production won them funding of \$50,000 from Rewards. The Rewards program is delivered through the partnership between the Plastics and Chemicals Industries Association (PACIA) and EPA Victoria.



Marplex, creating automotive plastics from carpet waste.



Marplex is one of the largest manufacturers and distributors of an extensive range of engineering thermoplastics for the Australasian polymer market.

In 2005 Marplex identified a high quality nylon waste stream from local carpet manufacturers that could be utilised in nylon thermoplastics for the automotive market.



With the support of this funding, the company has been able to minimise risk, solve challenges and negotiate successful agreements. Marplex has now commercialised three products, and believes up to 500 tonnes of waste nylon and 250 tonnes of waste polypropylene could be diverted annually from landfill or export for reuse in product instead of virgin polymer.

"This project has very significant outcomes, not just for Marplex but our industry,"

says Ken McDonald, Technical Director of Marplex.

"As far as we know, we are the first manufacturer to use recycled polymer content in components in Australia."

Continued overleaf

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Australian motor vehicles contain approximately 8.5% of plastic components by weight (a typical vehicle weighs 1,570 kg), and the demand for plastic components has been met principally by domestic or imported engineered polymers, or from imported components.

A new benchmark is set

Marplex's study aimed to establish a new benchmark in the manufacture of components with recyclate content for the Australian market. Successful outcomes will benefit automotive supply chain partners through the availability of alternative products, support original equipment manufacturers by increasing environmental standards and provide consumers with vehicles that have a smaller environmental footprint.

"The project objectives were to support internal R&D and quality assurance processes so that we could eliminate risk and validate the consistency and quality of carpet waste, and establish internal processes and controls to produce an in-specification engineering polymer product from recyclate,"

Mr McDonald says.

"We have been able to liaise with automotive component and vehicle manufacturers in our supply chain establishing product and component specifications, then we demonstrated that we had a market-ready product that met these specifications."

The project was conducted in three concurrent stages:

1. Testing of incoming material to validate densification process and material quality

2. R&D trials to establish production procedures for extruding material, quality specifications and acceptance criteria

3. Supply chain liaison to establish material and product quality specifications and acceptance criteria.

Case study



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Full scale trials lead to commercialisation

“Key results included the successful development of a number of Nylon 6, Nylon 66 and polypropylene grades from post industrial waste of carpet manufacturers,”

Mr McDonald says.

“With this grant we were able to undertake full scale production trials on each of the nylon grades, with polypropylene trails scheduled to run in the near future. We’re delighted that three of the nylon grades are now commercialised and anticipate applying this to some 20 components.”

While the economic benefits of the project were difficult to quantify, sustainability benefits are clear: the use of recycled material means substitution of raw materials, conservation of energy, transport and packaging, and diversion of carpet waste from landfill.

“The project showed that with strict control and segregation of material, high quality value added products can be produced. This will enable the Australian market to develop confidence in recycled polymers for demanding applications,”

Mr McDonald says.

Marplex is now pursuing market opportunities with its commercialised nylon grades, and will next conduct polypropylene trials.

Key outcomes

Rewards funding:	\$50,000
Reduction in annual nylon PIW:	500 tonnes
Reduction in annual polypropylene PIW:	250 tonnes
Real cost savings in improved energy efficiency and substituted materials	Over \$50K per year

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Interested in other PACIA Leaders?

PACIA has published a number of case studies, some of which showcase the actions of companies to improve their sustainability and others focus on key business strategies across companies. These can be found on our website www.pacia.org.au



The Rewards partnership

Plastics and Chemicals Industries Association (PACIA) and EPA Victoria (EPA) signed their second Sustainability Covenant in April 2009, confirming their ongoing commitment to work together with PACIA members in the development of innovative sustainable business solutions.

The Rewards program is funded through the Sustainability Covenant. It provides financial support for Victorian plastics and chemicals companies to implement the Sustainability Leadership Framework.

The Rewards program supports companies to investigate, research or pilot significant projects that will create a step change or transformation for the site, company or industry.



The Sustainability Leadership Framework

The Framework is both a comprehensive tool kit with useful information and also a program of support for member companies. The number of companies who are signing up to integrate sustainability into their business is growing as more companies take action to lead and adapt to changing conditions. We welcome enquiries on the Framework program.

For further information:

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