Case Study

The Vinyl Council of Australia: Roof tiles from recycled material

A VersrTile approach to a worldwide recycling problem.

August 2020

AT A GLANCE:

5,000-10,000

tonnes of vinyl coated polyester landfilled each year which could be recycled.

100%

fully recycled waste vinyl and polyester.

50°C

Roof tiles must withstand high temperatures during weather testing.

VersrTile

has the potential to solve a worldwide recycling problem with a high quality, value added product.

Innovation in a roof tile made from waste vinyl coated fabric—brand new to the Australian market.

WHY?

Organisations must be versatile when developing reuse and recycling solutions for waste products. The Vinyl Council of Australia, a Melbourne based industry sustainability organisation, has taken that literally with its trial product "VersrTile", a roof tile made from waste vinyl coated fabric.

Finding end markets for waste plastic is challenging, even more so for the vinyl coated polyester fabric used in items such as advertising banners, grain covers, construction site mesh, tent marquees, jumping castles and truck tarpaulins. An estimated 5,000-10,000 tonnes of the fabric enters landfill annually in Australia and the world is currently struggling to find solutions for this waste problem.

Committed to encouraging vinyl products' recycling, Vinyl Council of Australia partnered with Metropolitan Waste Resource Recovery Group (MWRRG) on a project to recycle the waste fabric for use in VersrTile, a prototype roof tile that would be new to the Australian market.

The Vinyl Council of Australia worked on a number of projects that attempted to create value added products, such as woven bags and highway noise barriers, using waste vinyl coated polyester fabric. Roof tiles showed the most potential, which in Australia are currently manufactured from virgin materials such as cement or furnace fired clay, showed the most potential.

METROPOLITAN WASTE AND RESOURCE RECOVERY GROUP

VICTORIA State Government

HOW?

The project brought together a multidisciplinary team, including Vinyl Council of Australia, Monash University, Welvic and Boral expertise, to work on a prototype tile. Expanding upon designs from previous Vinyl Council of Australia projects, this project's aim was to see if the waste vinyl and polyester could be developed into a tile that used 100% recycled material

The design team worked on the prototype designs, along with a number of samples. Boral built a test rig so the prototype could be subjected to Australian industry standard mechanical and weather testing. Concurrently, the project team worked on a preliminary business case for VersrTile, exploring potential markets, price points, production costs, and possible ongoing sources for waste vinyl coated polyester fabric and other required materials.

WHAT WAS THE RESULT?

- **Three prototypes tiles** were initially developed, that had good quality finishes and performed well during the important Australian standard Dynamic Weathering Test. However, during the mechanical Transverse Break Test, it was shown the tiles' vinyl and polyester composition was too flexible when temperatures exceeded 50°C.
- Although the tiles are particularly durable, they must hold their shape in hot conditions in order to be an effective roofing solution. The project found that the **prototype tiles would require further strengthening work** and composition development in order to meet industry standards.
- The business case showed that, although VersrTile would be a premium product, it would require high production rates for economic viability. This would mean **diverting significant quantities of vinyl coated polyester fabric from landfill annually**, requiring commitment from the whole value chain.
- The prototype development and testing project is considered the **midway point for the overall VersrTile project**. It is expected another two years are required to improve market data capture, coordinate waste material stock, enhance tile design, and advance reprocessing and production processes for higher volume and reduced unit cost.
- This project shows that with further ingenuity and commitment, **VersrTile has the potential to solve a worldwide recycling problem with a high quality, value added product**.

ABOUT MWRRG'S COMMERCIAL AND INDUSTRIAL WASTE PARTNERSHIP PROJECT

This pilot commercial and industrial (C&I) waste partnership project is a result of MWRRG research which found food and plastic waste represent two of the three highest volume C&I waste streams, have significant environmental impacts and offer the greatest potential for additional resource recovery. The project helps deliver our strategic objective of reducing waste sent to landfill as outlined in the Metropolitan Waste and Resource Recovery Implementation Plan 2016.
Download the Metropolitan Implementation Plan snapshot.