Case Study

Polyfoam Australia recycling polystyrene
World first expanded polystyrene recycling

August 2020

AT A GLANCE:

World first
mould to recycle 100% EPS.

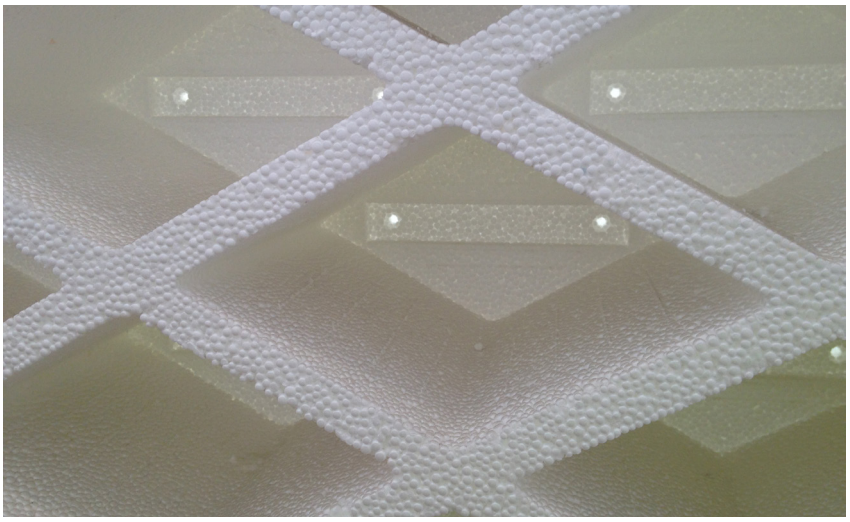
100%
expanded polystyrene recycled in new moulding machine.

40% increase
in the amount of EPS the can be recycled using the new machine

$400,000
to build new moulding machine to recycle expanded polystyrene.

8 more
expanded polystyrene recycling machines on their way.

Expanded polystyrene can be recycled using a moulding machine and tool to turn it into a recovered material for export and new products.



WHY?

Australians recycle only 27% of the 18,000 tonnes of single use expanded polystyrene (EPS) packaging produced annually. As an EPS manufacturer, Melbourne based national company Polyfoam Australia wanted to ensure it was maximising its efforts to recycle waste EPS from the outset of the product's life.

The idea of putting waste EPS back onto the production line was attractive but only possible with a limited amount of material. The time and expense taken to sort that material was prohibitive. A better plan was to develop capacity to mould products from the scrap EPS available at Polyfoam Australia's manufacturing sites.

Polyfoam Australia partnered with Metropolitan Waste Resource Recovery Group (MWRRG) to build a small prototype machine that could mould new products from waste EPS. The aim was to lift the amount of scrap recycled from 60 to 100 per cent, support new Australian markets for recycled products, and reduce the amount of EPS being transported to China for recycling.

The project has led Polyfoam Australia to world first success in developing a moulding tool capable of making commercial products from 100% unsorted EPS waste.

METROPOLITAN WASTE AND RESOURCE RECOVERY GROUP
VICTORIA State Government

HOW?

Before settling on development of a prototype moulding tool, Polyfoam Australia experimented with other EPS recycling options, including waste to energy, melting it back to solid polystyrene and compressing EPS into dense logs for international sale. None of these, however, provided significant environmental or financial benefits.

After partnering with MWRRG on the research and costs to develop the tool, Polyfoam Australia commenced prototype trials in 2018. There were some early concerns about the tool's filling component and challenges in sourcing a specially designed drive motor. But these were overcome and, after a two month trial process and initial development of only thin walled products, the prototype was soon producing thick walled products as originally proposed.

WHAT WAS THE RESULT?

- Polyfoam Australia is constructing a **full scale moulding machine and tool**, the first in the world capable of developing commercial products from 100% unsorted EPS waste.
- Expected to cost up to $400,000 to build, Polyfoam Australia believes the tool will **recoup its costs in a little over a year**. In addition to sales of new material, the recovery of expenditure will also result from avoiding costly waste removal.
- The new tool will allow Polyfoam Australia to accept waste EPS from a range of sources, increasing capacity to keep EPS from landfill. As a result of the new tool, its Dandenong factory's recycling section will quickly **move from being cost negative to value adding for the firm**.
- Polyfoam Australia is now **planning to build at least one full scale tool for its eight national stand alone and shared sites** and could develop them for the wider market.

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.