

Vistamaxx™ performance polymers

Value chain collaboration enhances recycling and product performance by using Vistamaxx™ performance polymers



Data and results presented herein apply specifically to the noted application under this case study. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge

With the increasing demand for alternative materials, the plastics industry experiences interest in the incorporation of recycled content into products. However, incorporating recycled content into foamed products, particularly in the building and construction sector, can compromise product consistency, mechanical strength, and overall performance. Without effective solutions to process and reuse these mixed plastic streams, designing for recyclability remains a formidable challenge.

Solution

To address the challenge, a collaborative effort across the value chain was initiated, involving key industry players including EREMA, Moxietec LLC, Engel, and ExxonMobil with Vistamaxx™ performance polymers playing an important role. EREMA, a global leader in plastics recycling systems, produced high quality pellets using its unique filtration and degassing system. The process handled a mixed stream of recyclates comprising 95% PP rigids and 5% PE film supplied by Prezero.

Moxietec LLC, known for its innovative foam technology, utilized its technology to produce lightweight locking blocks that can be used in the construction sector without reducing impact strength which other conventional foaming processes often compromise. The addition of Vistamaxx™ performance polymers helped to improve the impact resistance and toughness of the foamed components, enabling the incorporation of recycled content without compromising structural integrity.

Engel, a leading manufacturer of injection molding machines, combined all the attributes of the value chain into the production of thick-walled foamed blocks. These blocks, designed for the building and construction industry, offer design flexibility for single walls, double walls, and corner structures.

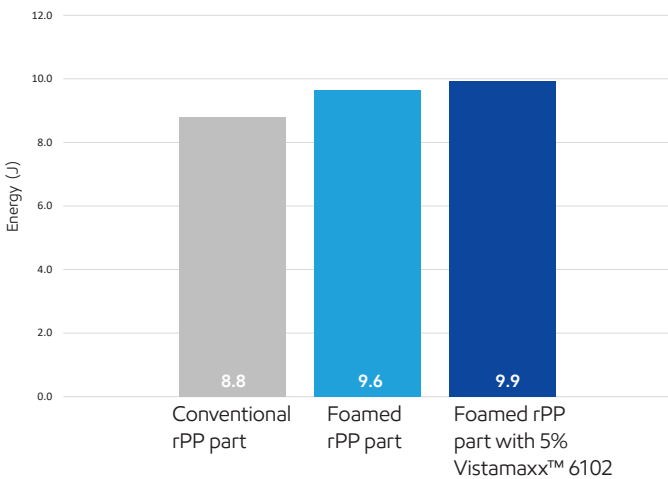
Results

Dart drop impact testing (Graph 1) shows that foam parts manufactured using Moxietec™ technology exhibited a 10% improvement in impact strength—measured by total energy at break—compared to conventional solid parts. This enhancement was particularly significant given that traditional foaming processes typically compromise impact performance relative to solid materials.

In addition to mechanical benefits, Moxietec™ technology enabled incorporation of recycled polypropylene content (rPP) with a final part weight approximately 30% lower than conventional solid parts. Further performance optimization was achieved through the incorporation of Vistamaxx™ performance polymers without sacrificing the weight reduction.

- Vistamaxx™ 3020 boosted foam impact strength by approximately 10% over EREMA foam alone.
- Vistamaxx™ 6102 delivered an even greater enhancement of around 17%, making it the preferred choice for the final formulation.

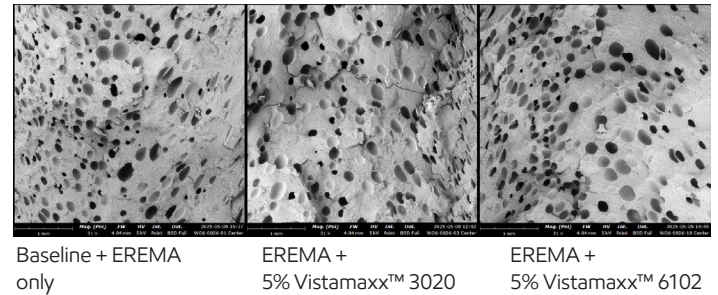
Graph 1: Dart drop impact testing (EREMA rPP foamed with Vistamaxx™ performance polymer)



Graph 2 shows excellent, fine, and uniform cellular structure attributed to Moxietec™ technology, and the addition of Vistamaxx 3020 or Vistamaxx 6102 had no impact on the structure.

This achievement demonstrates the power of value-chain collaboration in delivering innovative foamed products that feature lightweight design and enhanced toughness. By aligning expertise and capabilities across the value chain, we are able to co-develop solutions that not only meet performance demands but also advance material efficiency.

Graph 2: Structure of foamed brick



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Data from tests performed by or on behalf of ExxonMobil

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