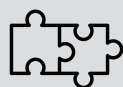




Vistamaxx™ performance polymers

Der Grüne Punkt, Haitian, and ExxonMobil collaborate to boost the performance of products incorporating recycled plastic content



Compatibility



Flexibility



Toughness



Enabling
more
efficient
production



Unlocks new
product
possibilities

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

Finding new ways to achieve high performance while incorporating recycled content

In pursuit of plastic circularity goals, manufacturers of plastic goods are looking for more ways to support the collection of plastic waste and potential diversion from landfills and incineration. Mechanical recycling breaks down plastic materials into pellets or shreds, which are then melted or mixed with other components to create new plastic products. The practice helps contribute to a more circular plastics economy, which seeks to create value from used materials, instead of disposing of them once they have reached their conventional end of life.

Mechanical recycling is expected to continue to play a role in the circular plastics economy, but it has limits. Because polymer performance often declines through the mechanical recycling process, the resulting products with recycled content can have lower performance than plastics made from virgin feedstock. The challenge is to get products with mechanically recycled content that meet higher performance standards.

Der Grüne Punkt, a leader in recycling solutions, needed a way to help brand owners meet their sustainability goal of incorporating more recycled content into their products. However, achieving the right combination of mechanical strength and flexibility from products with recycled plastic content remained a challenge.

Solution

Boosting performance of a flying disc with recycled plastic content

Der Grüne Punkt teamed up with ExxonMobil and Haitian to tackle this challenge head-on with the production of flying disc toys using a 5-10% dose of ExxonMobil's Vistamaxx™ performance polymers on Haitian's 5th generation injection molding machines.

Vistamaxx™ performance polymers compatibilized well with the polypropylene recyclate from Der Grüne Punkt. ExxonMobil technology and Der Grüne Punkt worked together to optimize the right Vistamaxx™ ratio to use to balance and optimize properties of the flying disc toys.

Haitian optimized settings on its 5th generation of injection molding machines (IMM) achieving 20-40% energy savings compared to the previous machine generation.

Results

A stronger, more flexible product made more efficiently

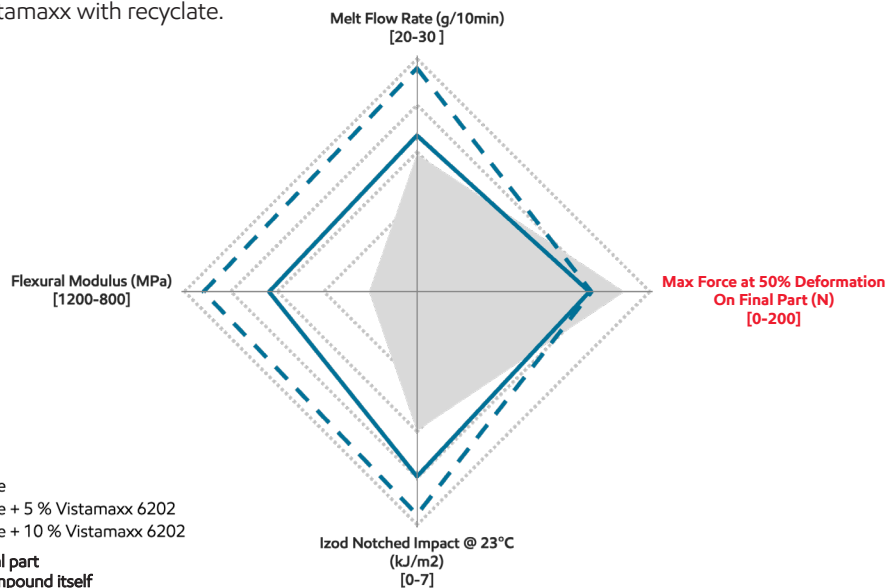
Blending 10% Vistamaxx™ with Systalen PP-C15001 recyclate from Der Grüne Punkt allowed significant improvement in both the mechanical properties of the flying disc toys and the processability.

The results were impressive:

- **Improved strength:** The impact strength of the compound with recycled content at room temperature improved by 38%, while at 0°C, it was boosted by 39%, making the discs tougher and more durable.
- **Better flexibility:** Flexural modulus of the compound decreased by 25%, giving the final product the perfect balance between strength and flexibility.
- **Faster, more efficient production:** The melt flow rate (MFR) increased by 14%, potentially allowing for faster production times and reduced energy consumption.
- **Impact on the final part:** additional flexibility of 19% measured on the flying disc toy itself when moving from 0 to 5% or 10% of Vistamaxx with recyclate.

Thanks to the innovative value chain collaboration involving Der Grüne Punkt's materials with recycled content, Vistamaxx™ performance polymers from ExxonMobil, and Haitian's 5th generation injection molding machines, the flying disc toys, incorporating polypropylene recyclate boosted by Vistamaxx™ performance polymers, met stringent performance standards while incorporating recycled content.

This success showcases how collaboration across the value chain and creative material solutions can help businesses meet their sustainability goal of incorporating recycled content in their products while efficiently delivering high-quality products.



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