

Delrin® Renewable Attributed Drives Productivity and Sustainability for High-speed Filling Lines



Project

Delrin® Renewable Attributed homopolymer with advanced slip technology played a key role in the development of a break-through conveyor material for bottling and other filling operations that avoids the need for traditional external lubricants. The Regina e-F.A.S.T. (ecological friction abating sliding thermoplastic) material was developed by Delrin in close collaboration with Regina Chain, a global leader in conveyor chains, belts and components.

Bottlers have sought to move to dry-running conveyors to enable the line to operate smoothly without the need for external lubricants that attract dust requiring periodic wash off. This causes interruptions to the lines that result in additional labor, materials and water – also generating wastewater needing proper disposal.

Regina turned to Delrin, its supplier of more than 20 years, for materials expertise, technical resources and a strong focus on sustainable solutions. The goal was to develop an innovative, dry-running conveyor material for bottle-filling customers that would enable high-speed production, allow bottles to move smoothly and extend the useful life of the conveyor creating a more sustainable operation.

Challenges

Dry running requires a material with slip properties that can ensure a low coefficient of friction (COF) that remains constant over time. Conveyors made with conventional acetal and polybutylene terephthalate (PBT) resins often require application of external lubricants to maintain a low COF over extended periods of demanding processing.

The new technology had to provide low, stable COF without migrating to the surface of the conveyor where it could cause dust collection – a similar issue inherent to the use of lubricants.

High slip performance would allow the elimination of external lubricants and reduce chain pull, helping to cut the amount of energy required to operate the conveyor.

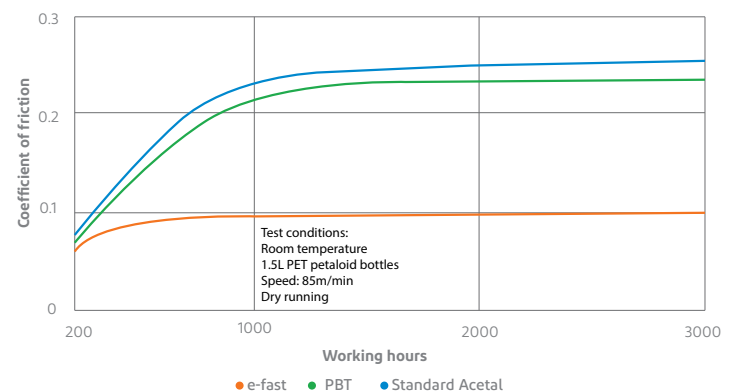
Although dry running minimizes or eliminates line cleaning due to dust, periodic sanitizing is still required. Operators need a way to identify when the line requires sanitizing to support overall processing, safety, cleanliness and efficiency.

Solution

Working closely throughout design, development, testing and prototyping, Delrin and Regina collaboratively created the Regina e-F.A.S.T. material – a new, custom-colored grade of Delrin® Renewable Attributed homopolymer with advanced slip technology.

Delrin performed in-house tribology work and conducted extensive testing at both Regina's facility in Latina, Italy, and its customers' sites. The team also developed a conveyor line prototype at the Delrin European Technical Center in Meyrin, Switzerland, to simulate real-world conditions.

The new Regina e-F.A.S.T. material offers significantly lower COF – a reduction of up to 40 percent compared to standard acetal and PBT. This critical property remains stable over time, enabling the full dry running of the conveyor. In addition, Delrin® Renewable Attributed demonstrates a world-class environmental impact profile that helps customers achieve a lower carbon footprint and supports their sustainability goals.



Source: DuPont

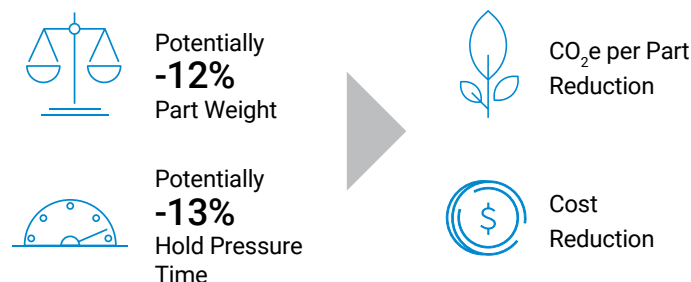
With the elimination of external lubricants, line cleaning is only required for sanitation. Delrin® customized its Renewable Attributed grade for e-F.A.S.T. material with a distinctive bright yellow color to help Regina's customers quickly identify the need for sanitizing.

The product's exceptionally low COF also reduces chain pull, helping to decrease the amount of energy needed to run the line. Testing has shown that Regina's conveyor chains and belts made with this material can reduce energy consumption on a high-speed bottling line by up to 40 percent. In addition, lower stress on conveyor chains also helps extend their useful life by up to 40 percent while also lengthening time between line maintenance cycles.

Finally, the surface slip performance of this unique material allows bottles to move smoothly along the conveyor line, reducing wear and tear, thus helping to preserve the bottles' clarity, haptic properties, and shelf appeal.



By optimizing part design, Delrin® Renewable Attributed enables environmental and cost savings compared to high MW copolymer alternatives.

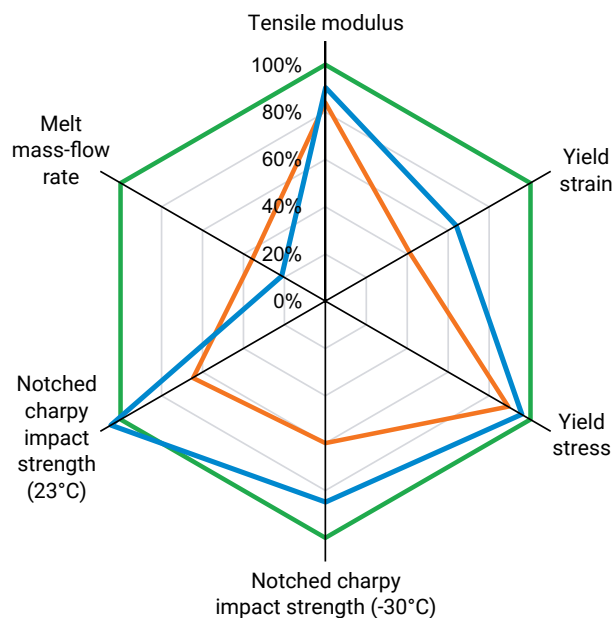


Delrin® Renewable Attributed

Delrin® Renewable Attributed is a high performance homopolymer that outperforms low friction acetal copolymers, enables sustainable design, optimizes resource efficiency and creates reliable parts made to last.

The product is produced using 100% bio-feedstock from waste in accordance with mass balance principles. The Delrin manufacturing site and supply chain are accredited through the globally recognized International Sustainability and Carbon Certification (ISCC) certification system.

Delrin® Renewable Attributed delivers superior performance compared to competitive low friction copolymers. With higher tensile properties (+16%) and improved sliding performance (+45%) achieved on a significantly better flow, the product enables the design of parts with excellent wear/friction performance, durability and ultra-low COF.



— Delrin® RA300CPE — Typical HMW copolymer
— Typical UHMW copolymer

HMW = High Molecular Weight
UHMW = Ultra High Molecular Weight

Source: DuPont

To learn more, contact your Delrin representative or visit [Delrin.com](https://www.delin.com).



Delrin® is an industry-leading premium industrial polymer business. Grounded in strong innovation, Delrin is a category creator with a longstanding reputation for quality, reliability, supply and product performance. The iconic Delrin brand, coupled with proprietary technology and deep application expertise make us a leader in the high-end engineering polymer market. Delrin has exciting growth prospects from exposure to automation, actuation, healthcare, mobility and consumer applications.

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