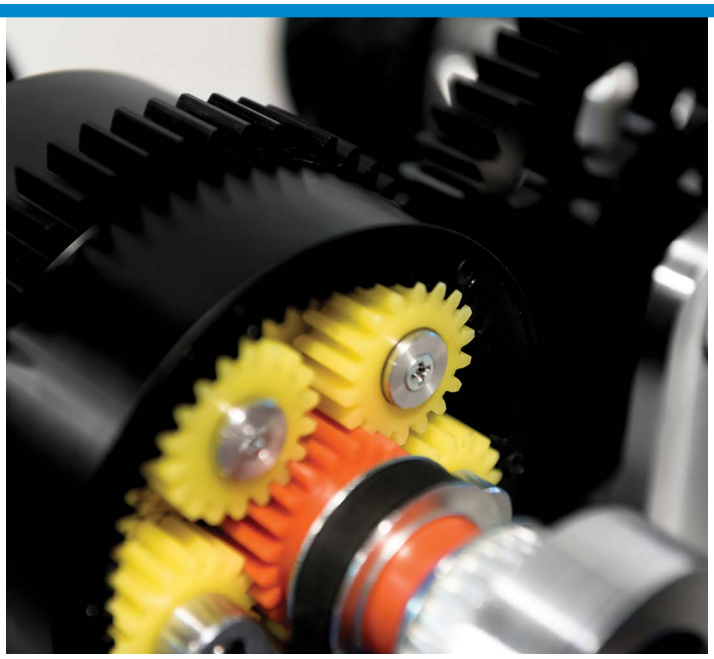
LIP Moves Production into High Gear with Delrin® 100CPE Acetal Homopolymer



The challenge

Polymers are an important resource for producing technical components, according to Italy's LIP srl, a leading manufacturer of standard and custom gears. Compared to traditional metal, plastics offer greater design freedom, lower weight, reduced noise, elimination of corrosion, the ability to absorb vibration and shock, and a low coefficient of friction (often through self-lubrication). Acetal and nylon are among the most common thermoplastics used in gearing.

For more than 40 years, LIP has injection-molded gears and other technical products using Delrin® acetal homopolymer, a polyoxymethylene homopolymer (POM-H). Most of its gears are used in worm gearboxes for electromedical, home automation and home appliance applications. LIP also produces complete gearboxes with Delrin gears for vending machines, ice makers and agricultural equipment.

"Over time and as our customers' needs changed, we have gradually replaced metal in our gears with Delrin acetal solutions," said Carlo Sansilvestri, managing director, LIP. "Our relationships with Delrin and its Italian distributor, Biesterfeld Polybass S.p.A., have been great assets. Along with the high performance of the material, this collaboration has kept us loyal to Delrin."

To strengthen its competitive position, LIP sought ways to enhance manufacturing efficiency and cost-effectiveness – while continuing to use proven Delrin technology. The company was eager to test new Delrin® 100CPE acetal homopolymer, which promised to deliver significant processing and cost advantages.

The solution

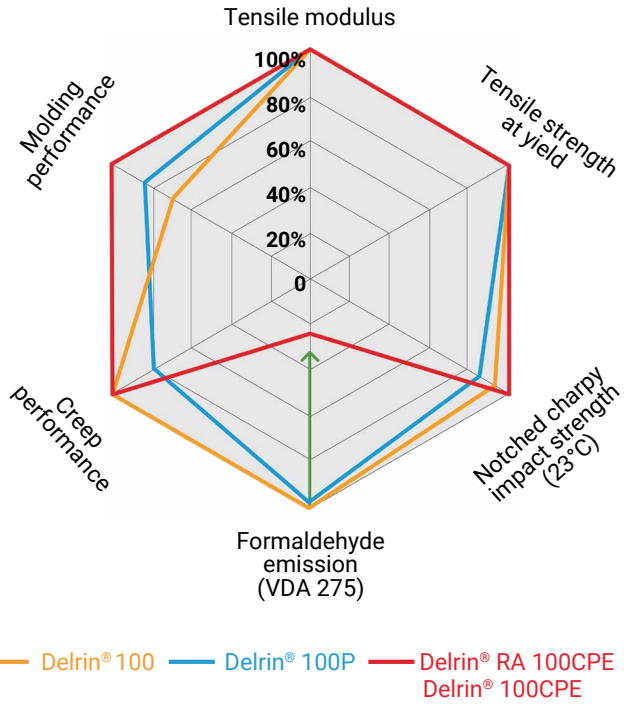
Delrin® 100CPE resin is the successor to the well-established Delrin® 100 series, known for high strength, precision and fatigue resistance. In addition to lower emissions, Delrin® 100CPE resin:

- Significantly reduces mold deposits during processing
- Requires less-frequent and shorter cleanings due to lower mold deposits, which can cut maintenance costs

Adopting Delrin® 100CPE acetal homopolymer enabled LIP to extend the time between mold cleanings by 33 percent, supporting higher throughput and greater cost-effectiveness. Importantly, Delrin® 100CPE solution delivers the same high-performance properties that LIP had relied upon with the Delrin® 100 product.

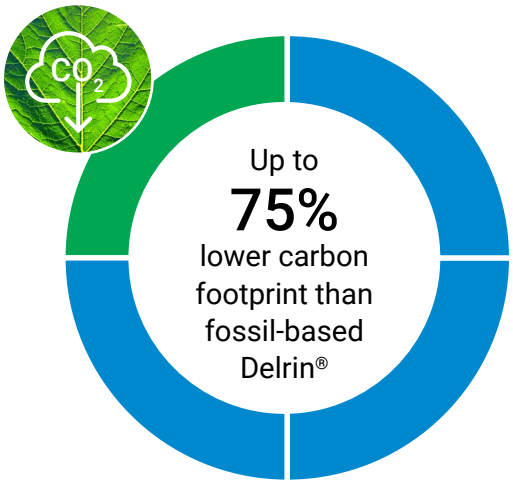
"We wanted to maintain the key performance properties of Delrin® 100 that are essential to our gearing products, particularly impact and yield strength," said Sansilvestri. "Very often our customers' applications undergo sudden stops and motion reversals, and the performance of Delrin® 100CPE resin provides a greater margin of safety in the most critical scenarios."

Emission reduction



The success

LIP is committed to continuous improvement to benefit customers and their businesses. The company is always exploring new solutions that could further improve the quality, reliability and sustainability profile of its gearing.



"We foresee that environmental impact reduction will become more relevant in the near future," said Sansilvestri. "It's very important to us to be able to meet upcoming requirements for sustainable materials, while maintaining the high performance that our customers have come to expect."

To be prepared for increasing market demand for sustainable products while retaining the many advantages of Delrin® 100CPE resin, LIP recently began trialing Delrin's newest product: Delrin® Renewable Attributed (RA) acetal homopolymer.

This new solution won a 2021 R&D 100 Award in the Mechanical/Materials category, based on its world-class environmental impact profile. Delrin® RA products demonstrate up to a 75 percent reduction in Global Warming Potential (GWP) compared to fossil-based Delrin.

The base polymer for Delrin® RA grades is:

- Produced from 100-percent certified bio-feedstock from waste, according to mass balance principles
- Manufactured using 100-percent certified renewable electricity, steam-sourced via municipal waste energy recovery

Of particular interest to LIP, the new resin's high strength and fatigue resistance can extend the useful life of parts to reduce premature failure and waste. This material can be substituted for Delrin® 100CPE resin with identical performance, avoiding the need for further homologations and making the transition quick and easy.

Sansilvestri concluded, "Based on our encouraging results to date with Delrin® RA, we expect to offer our customers precision gears with more environmental benefits, while maintaining excellent performance and remaining cost competitive, which is vital. Trusting once again in Delrin technology and the Delrin/Biesterfeld team, we are excited about the future."

To learn more, contact your Delrin representative or visit Delrin.com.

Delrin®

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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