

# Premix Hits Ground Running With State-of-the-Art Compounding Plant

With its first automated facility in the U.S., the company is producing polyolefin-based conductive polymers for pipettes and more.

A family-owned Finnish firm with a track record of providing conductive polymers for about 45 years has expanded its global

By **Jim Callari**  
Editorial Director

footprint by opening a state-of-the-art compounding plant in Dallas, North Carolina, just outside of Charlotte.

Premix USA has been operating since June, running automated production lines it engineered in tandem with Coperion. In the new facility, the company produces a wide range of polyethylene (PE)- and polypropylene (PP)-based conductive compounds for end markets that include aerospace and defense, automotive, wire/cable, mining, logistics, material handling, electronics and healthcare.

Premix previously served the U.S. market, as well as more than 55 other countries, from its factory in Rajamäki, Finland, explains Jyrki Taiminen, general manager of the U.S. operation. But the company received an \$80 million post-

pandemic grant from the U.S. government to build a plant in North Carolina, due mostly to the fact that it is a key supplier of compounds to produce laboratory pipettes. The pandemic triggered an unprecedented, three-to-five-fold surge in global demand for pipettes and pipette tips, leading to severe, year-long supply chain shortages for a material the U.S. government ultimately categorized as critical.

“The whole world was fighting for the scarce supply of pipette materials,” recalls Taiminen. “We were able to supply material with a delivery accuracy of about 98%. We more than doubled the business in this area, and as a result we got good word of mouth as a premier supplier. Then one of our global customers gave us a tip that the U.S. government was looking for someone to build a factory to improve the U.S. supply of these critical materials, so we submitted a bid and received the grant.”

While the factory in Finland produces conductive materials from a wide range of resins, Premix USA is currently focusing on PE- and PP-based compounds for pipettes. “Time will tell how we expand and where we expand,” says Taiminen, “but conductive compounds based on polyolefins are the base of the business now. Our factory is highly automated, and that lends itself to running large volumes.”

## HOW AUTOMATION POWERS HIGH VOLUMES

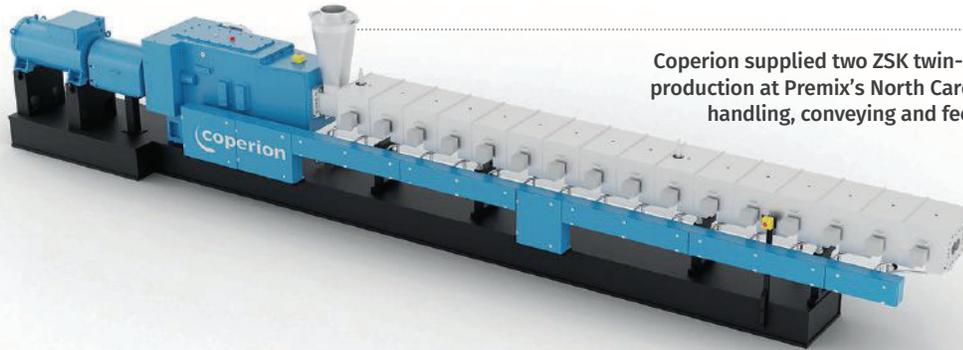
In North Carolina, Premix runs two Coperion designed extrusion lines which consist of ZSK twin-screw extruders and a series of Combiflow Blenders that are equipped with real-time sensing to ensure consistency across large batches.

Automated transfer of raw materials — such as base polymers, carbon black and other additives that are used depending on the requirements of the formulation — is intended to reduce manual handling, boost safety, and ensure reproducible compounding. A PLC-based control system provides full integration and synchronization of all conveying, feeding, extrusion, QC and packaging systems.

Sensors and online spectroscopic tools also enable continuous quality feedback. Conductivity, resistivity and material density are captured on the fly, enabling immediate adjustments. This data connect directly to the plant’s manufacturing execution system for traceability, reporting and compliance.

Jyrki Taiminen, Premix USA’s general manager, welcomes guests who attended June’s opening of its new plant for producing conductive compounds in North Carolina. Source: Premix





Coperion supplied two ZSK twin-screw extruders for high-volume production at Premix's North Carolina facility, along with material handling, conveying and feeding systems. Source: Coperion

In addition, the upgraded new Premix facility has a lab services team onsite that supports not only production but also collaborative and toll compounding work for clients.

While Premix broke ground on the new plant in 2023, it brought in Coperion the year before to design, engineer, install and commission a fully integrated extrusion line. Ashwin Bhat, Coperion's engineering director, and his team, visited the Premix plant in Finland, which Coperion also supplies, to map out equipment specification and layout on a turnkey basis. Raw material is

brought in and stored in silos both outside and inside the plant. Inside, the plant is also equipped with gaylor-unloading stations that can accommodate both large and small bags.

As Bhat explains, material is vacuum conveyed to the top level of the building and accurately dosed with gravimetric feeders to the extruder. The compound is then underwater pelletized and conveyed to a centrifugal dryer and classifier.

The Premix plant is equipped with two identical lines, Bhat adds. To guard against contamination, the plant features ▶

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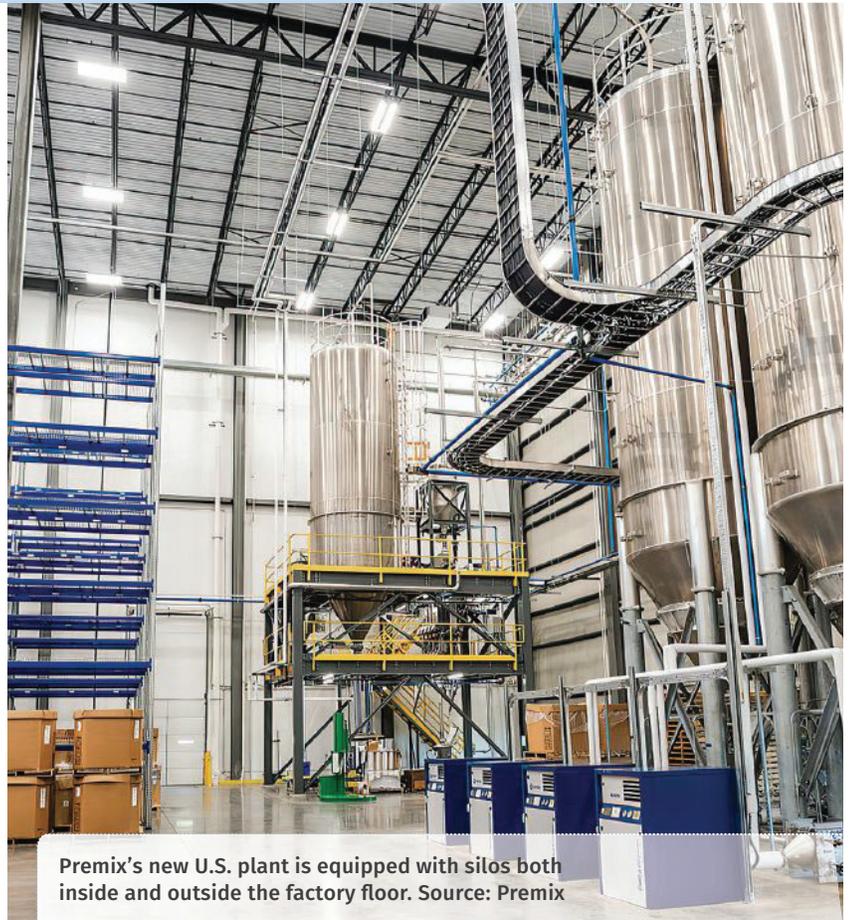
a separate room for mixing powder. In conductive plastics, metal contamination is a significant concern. Therefore, raw materials and finished products pass through advanced metal detection and rejection systems. Finally, the product is packaged or loaded onto bulk trucks.

#### AI-POWERED R&D

Premix also utilizes an in-house artificial intelligence/machine learning platform that the company calls PERTTI 3.0 (Premix Recipe Tool for Technical Insights). This platform has been trained on more than four decades of formulation data — leveraging thousands of compound recipes and performance records, the company says.

Core capabilities of the PERTTI 3.0 platform include:

- **Data retrieval:** For any recipe, even previously untested raw materials, the tool provides instant predictions of key material properties.
- **Recipe ranking:** It intelligently assesses existing formulations to highlight best-fit options — cutting development redundancy.



Premix's new U.S. plant is equipped with silos both inside and outside the factory floor. Source: Premix

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Built with open-source frameworks and modular design, Premix says PERTTI 3.0 can adapt rapidly to new polymer families and materials in development. As Premix scales operations in the U.S., PERTTI enables local R&D teams to generate optimized formulations tailored to regional raw materials and regulatory regimes.

With PERTTI, Taiminen says formulation cycles shrink from months to days. Screening iterations, candidate selection and scaleup planning can occur significantly faster. Customers receive faster time-to-sample, more accurate material performance predictions, reduced waste during development and enhanced confidence in first-pass formulations, he adds.

Premix's automated systems in the U.S. leverage sensor data (e.g., from conductivity or melt flow probes) in real time, feeding predictive performance

feedback into the plant's MES. PERTTI-generated candidate recipes are automatically translated into control setpoints for pilot-scale blending, enabling rapid physical testing.

Closed-loop learning means that test results loop back into the AI database, refining future predictions and enhancing model accuracy over time. This approach creates a self-improving system: Data from production and lab tests inform AI models that, in turn, guide the next round of automation-validated recipes.

With an accelerated time to market and a highly automated operation, Premix USA is eyeing expansion opportunities. "We've tried to identify those products where we believe there is high U.S. demand, and because we are set up to deliver big volumes," Taiminen says, "we provide a competitive edge to our customers." <sup>PT</sup>

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Automation is a critical part of Premix's operation in North Carolina. Here, pelletized compounds are fed into boxes for shipping with no human interaction. Source: Premix