

Elevating Automotive Lenses

Combining Precision Cleaning,
Automated Coating and UV Cure

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Performance Coating's finishing line is designed to process high end applications such as automotive headlamp lenses. The line supports high-precision tasks like anti-fog coatings and UV curing. *Source (All Images) | Sprimag*

Innovative Coating Line Elevates Automotive Lens Production

Performance Coatings' dual-capable coating line uses CO₂ cleaning technology to boost yield and reduce contaminants.

BY SCOTT FRANCIS EDITOR-IN-CHIEF

► In a significant advancement for precision finishing in the automotive sector, Performance Coatings LLC (Oconomowoc, Wisconsin), a specialist in liquid and powder coatings, has unveiled a state-of-the-art finishing line designed and manufactured by Sprimag Inc. (Cincinnati, Ohio), incorporating advanced CO₂ cleaning technology from Cool Clean Technologies LLC (Eagan, Minnesota). The new installation, which went live in early 2025, targets high-end applications such as automotive headlamp lenses, marking a strategic expansion for Performance Coatings into injection molding and hard coating. The collaboration underscores a commitment to efficiency, cleanliness and flexibility, addressing the unique challenges of coating polycarbonate substrates for demanding industries.

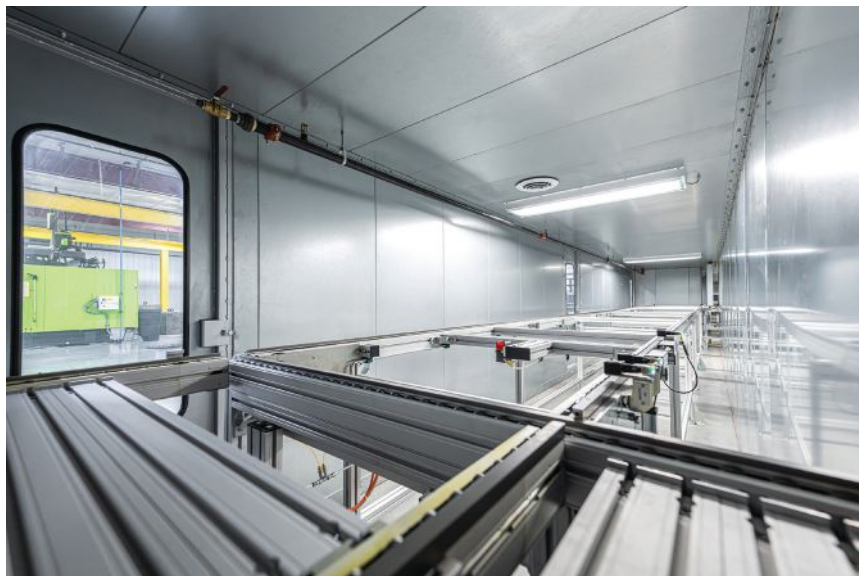
Performance Coatings was founded in 2014 with a focus on flexible, adaptive finishing solutions for markets where traditional processes fall short. Initially serving heavy industrial sectors like power sports (including on-road applications



for clients such as Harley-Davidson and Indian Motorcycle), medical devices and agricultural equipment, the company has built a reputation for high-turnover powder and liquid finishing, complete with post-inspection polishing, buffing and graphics application.

The push into automotive lenses began about three-and-a-half years ago when Performance Coatings was approached to develop an industry-leading operation for injection molding and hard coating. Recognizing the opportunity to control its supply chain and reduce costs, the company invested in

A custom smart conveyor system enables versatility, allowing for adjustments to coating recipes and mixed production runs.



Automated coating equipment supplier Sprimag custom designed the finishing line for Performance Coatings, integrating robotics, conveyors and curing systems.

injection molding presses from Engel (York, Pennsylvania) — models including 770-ton, 340-ton and 180-ton units — dedicated exclusively to clear polycarbonate parts. This setup eliminates external contaminants by keeping molding and coating in-house and within feet of each other.

The partnership with Sprimag and Cool Clean emerged from a need for proven expertise. After evaluating several equipment suppliers, Performance Coatings selected Sprimag for its century-long history in coating systems — Sprimag celebrated its 100th anniversary in 2025 — and the company's familiarity with UV hard coating applications. Sprimag, an automated coating equipment manufacturer, designed the core finishing line, integrating robotics, conveyors and curing systems. Cool Clean was brought in as Sprimag's long-time partner (over a decade of collaboration) to handle pre-coating surface preparation. Targeted applications include automotive headlamp lenses and other lighting components for power sports, with opportunities in heavy trucks and full automotive support for major OEMs.

This collaboration addresses the inherent challenges of polycarbonate substrates, which are prone to static attraction of particulates, scratching



Cool Clean's CO₂ cleaning technology provides a dry, chemical-free cleaning process that helps mitigate contamination due to the static attraction of particulates.

and contamination from ambient air or packaging. By combining injection molding with advanced finishing, Performance Coatings aims to streamline production, reduce scrap and offer Tier 1-approved solutions directly to customers.

The new line

The heart of the installation is a dual-capable finishing line engineered by Sprimag, functioning as “two lines in one” for UV and thermal curing processes. This setup supports liquid finishing, with a focus on hard coatings for clear-on-clear applications at thin film builds (around 12 microns).

Smart conveyor system. A flexible, flat-pallet conveyor with RFID tags allows for on-the-fly recipe adjustments. Pallets (800 × 1,000 millimeters) can be directed to specific paths, enabling mixed production runs. Parts are removed from the main conveyor for isolated processing in booths, minimizing cross-contamination from conveyor dirt or overspray.

Robotic application and booths. Integrated robotics handle precise coating in isolated booths — one dedicated to UV hard coating and another for base/clear or thermal applications.

This setup supports high-precision tasks like anti-fog coatings, which can run concurrently with UV processes.

Curing options. The line includes UV curing for rapid, energy-efficient hardening and thermal ovens for applications requiring heat-based curing. Tunnel enclosures with HEPA filtration maintain a near-class 100 clean room environment, ensuring contaminant-free processing.

Integration and flexibility. The system routes pallets dynamically — skipping booths or ovens as needed — for seamless transitions between UV and thermal runs. Throughput is optimized for high-volume production, with the ability to handle diverse part recipes without downtime.

This hybrid design not only serves current automotive lens programs but also positions Performance Coatings for growth, as the line can adapt to varying technical needs without major reconfiguration.

CO₂ cleaning for precision and efficiency

A critical component of the line is Cool Clean's CO₂ cleaning technology, integrated by Sprimag to prep parts before coating. Polycarbonate lenses demand impeccable surface cleanliness, as even minor contaminants can lead to visible defects in thin, clear coatings, resulting in scrap.

Cool Clean's Omega system delivers a customizable CO₂ spray via specialized nozzles, providing a dry, chemical-free cleaning process. It works through a combination

of mechanical impact (dislodging particulates), thermal shock (rapid cooling to detach contaminants) and solvent-like action (removing light oils). Unlike traditional power washing, which requires wetting, heating, drying and cooling — consuming space, energy and time — CO₂ cleaning is instantaneous, cleaning and drying in one step.

At Performance Coatings, the system is fully integrated with the robotics. With it, yields consistently hit 95-97%, even for OEM automotive specs. This precision is vital for thin-film applications where defects are immediately visible, reducing rework and boosting profitability. Sprimag's ventilation and HEPA filtration complement this by evacuating dislodged debris, preventing recontamination and maintaining a pristine environment — capable of removing particles down to 0.2 micron, exceeding class 100 clean room standards.

Overall, the Cool Clean integration has slashed scrap rates from 7-14% to below 4% in similar installations, and enhanced efficiency, enabling Performance Coatings to meet stringent Class A automotive standards.

Broadening applications, tapping into adjacent markets

Looking ahead, Performance Coatings plans to leverage the line's versatility for broader applications. The company is pursuing IATF 16949 certification to unlock opportunities in

full automotive production. This will expand beyond headlamps to other lighting features in power sports, heavy trucks and general automotive.

The thermal leg of the line is already in use for anti-fog coatings, which are applied in tandem with hard coats — eliminating the need for cross-country shipping that competitors face. Within 12-18 months, the line is expected to reach full capacity, prompting exploration of thermal hard coats and legacy programs. Performance Coating's vision includes molding and coating parts in-house for cost savings, such as saddlebag lids for power sports clients.

While currently focused on transportation sectors, Performance Coatings envisions tapping into adjacent industries where injection molding pairs with advanced finishing, potentially including medical or industrial optics. By maintaining flexibility in UV and thermal processes, the company aims to address diverse technical needs, ensuring it can quote and win programs that others might lose due to limited capabilities.

The idea of being a one-stop shop for these kinds of parts gives Performance Coatings a distinct advantage as most injection molders outsource coatings for their parts. "We've always had the vision of being able to make the parts, coupling injection molding with our coating operations," says Performance Coatings owner and president Dave Kinney. "It knocks out a lot of the cost for our customers." ■■■