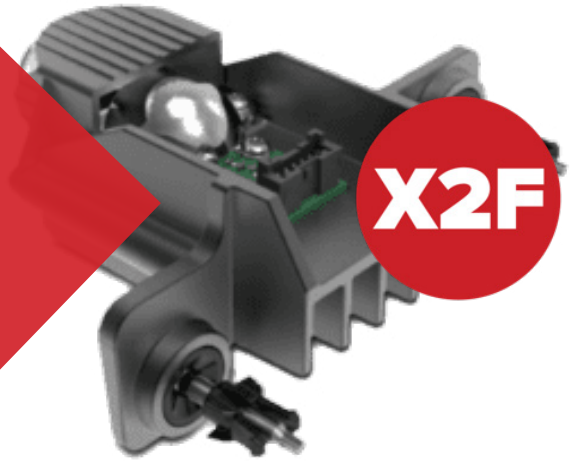
X2F and Covestro Launch New Collaboration on Innovative In-Mold Electronics for Automotive Lighting

Thermally Conductive Polycarbonate Heat-Sinks Can Be 49% Lighter Than Cast Aluminum



by Joseph Grande for Business Wire | September 29, 2022

LOVELAND, Colo.–(BUSINESS WIRE)–X2F announced today that it has joined a unique collaboration with Covestro, one of the world's leading manufacturers of high-quality polymer materials, to develop a thermally conductive automotive heat-sink with in-mold electronics using X2F's transformative controlled viscosity molding technology. Application samples will be displayed at Covestro's booth (Hall 6/A75-1/A75-2) during the K 2022 exhibition Oct. 19-26, in Düsseldorf, Germany. This new product will be a unique alternative for automotive OEMs and processors who seek a replacement for cast aluminium heat-sinks that is both lighter and more affordable.

The new heat-sink molded of Makrolon® polycarbonate (PC) is approximately half as heavy as the typical aluminum part. It is part of an in-mold assembly that can be used to integrate LED modules directly into the headlamp housing – eliminating the weight and labor associated with the installation of brackets, screws, thermal pastes, and adhesives. The X2F technology is production-ready and has been demonstrated in high-volume series manufacturing for other applications.

Covestro continues to pioneer the use of in-mold electronics (IME) coupled with the heat management that Makrolon® TC polycarbonate provides.

"This new program involves using controlled viscosity molding by X2F to attach the LED module directly onto the thermally conductive heat-sink without fundamentally changing the heat-sink adjuster module design. We are pleased with the outcome so far of the X2F project where we have recently seen enhanced thermal management performance compared to traditional injection-molded processes, and look forward to how the automotive industry will adopt the technology.," said Paul Platte, Senior Marketing Manager, Covestro LLC.
X2F's process enables sensitive electronics to be insert molded, thus providing functional integration, heat management, modularity, and miniaturization.

"This innovative technology enables the manufacture of previously impossible-to-mold thermoplastic parts that provide step-change improvements for our customers. In the case of heat-sinks, it dramatically streamlines production, reduces manufacturing times, eliminates fasteners and pastes, and increases product design flexibility," said Reza Garaee, senior project manager for

X2F. "This can be a game-changer for OEMs, and we're thrilled to launch this new collaboration with Covestro." X2F's ability to mold thermally conductive materials has applications far beyond heat-sinks. Thermal management is critical for superior performance in batteries, motors, and printed circuit board applications. The X2F controlled viscosity, low-pressure molding approach allows highly filled materials to be molded that are not possible with other manufacturing approaches. The result is 30-200% improvement in performance depending on the application and materials used.

X2F recently added a rotary table which reduces cycle times and opens up higher-volume production for its controlled viscosity molding machine. The rotary table enables X2F to reach production volumes of up to four million parts per year with one unit, depending on the cycle time, for the manufacture of critical components in the electronics, automotive, industrial, and medical industries.

ABOUT COVESTRO

Covestro LLC is part of the global Covestro business, which is among the world's leading manufacturers of high-quality polymer materials and their components. With its innovative products, processes and methods, the company helps enhance sustainability and the quality of life in many areas. Covestro supplies customers around the world in key industries such as mobility, building and living, as well as the electrical and electronics sector. In addition, polymers from Covestro are also used in sectors such as sports and leisure, cosmetics and health, as well as in the chemical industry itself.

Makrolon® is a registered trademark of Covestro Group.

The company is committed to becoming fully circular and aims to become climate neutral by 2035 (scope 1 and 2). Covestro generated sales of around EUR 15.9 billion in fiscal 2021. At the end of 2021, the company had 50 production sites worldwide and employed approximately 17,900 people (calculated as full-time equivalents). Find more information at www.covestro.us

X2F.com

ABOUT X2F:

X2F, based in Loveland, CO., is commercializing a new category of molding technology that leverages controlled viscosity and a patented pulse-packing approach to create high-value components for a variety of industries. X2F's process uses advanced materials previously thought impossible to mold and achieves complex product geometries with improved operational efficiencies. The technology creates entirely new paradigms in product design, tooling, and material science for molded parts.

Initial target applications include over molding of delicate electronics and circuitry, highly filled engineering resins, and polymer-based optics with improved properties. The company has financial backing from Atlas Innovate with senior advisors that include the former CEOs of General Motors and Dow Chemical. For more information, visit www.x2f.com.

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