

SmartCavityWax: An end-to-end cavity protection solution with infrared drying

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alpha-tec, part of the Eisenmann family, presents during this year's Technology Forum its unique end-to-end cavity protection solution. SmartCavityWax is a comprehensive turnkey solution comprising three seamlessly integrated modules: highly-precise metering, robot-based or manual application, and cost-efficient infrared drying that leverages rapidly solidifying wax.

In automotive manufacturing, cavities are coated with wax to effectively protect the car body from corrosion. The wax is usually dried by convection drying. However, these systems are very expensive, energy inefficient, and have a large footprint.

Highly-precise metering reduces wax consumption

alpha-tec's solution ensures that wax is metered to within approximately ± 0.1 ml for discharge volumes between 2-15 ml per cavity. This significantly reduces the required shot volume, and cuts material, cleaning, and disposal costs. SmartCavityWax has the potential to save up to 20 metric tons of wax a year compared to other systems on the market with ± 2 ml metering precision.

Reduced overspill due to rapidly solidifying wax

The use of proven solvent-free waxes that rapidly solidify minimizes drip travel. This is achieved by the targeted application of heat to the cavity, warming it to 60° Celsius for one minute. The heat quickly dissipates to unheated parts of the structure, effectively cooling the cavity. When the wax has cooled to 45° Celsius, it acquires a gel-like consistency, preventing it from dripping and minimizing overspill.

Highly efficient and cost-effective infrared drying

Leveraging cost-efficient infrared dryers to target specific areas of cavities and utilizing passive cooling methods cuts electricity costs by up to 50 percent. Furthermore, infrared dryers require up to 65 percent less space compared with conventional convection drying systems with active cooling. A versatile solution, suitable for the underbody The formation of wax drops during conventional processes limits the use of infrared dryers for underbody tasks. Wax drops can easily damage these dryers. The development of a highly

heat-resistant, infrared-permeable plastic foil, enables heaters to be deployed in areas where they might be struck by wax drops, such as the rocker panel and underbody. The foil protects the infrared heater from soiling and, in conjunction with fully automated cleaning, enables continuous operation.