**Infrared Ovens – Making A Difference**

**Infrared paint drying equipment is used worldwide. At General Motors, as well as at Osby AB, Sweden, it has improved productivity and finish quality.**

According to Vice President of Engineering, Nick Fusilli, Thermal Innovations, a U.S. affiliate of Tri Innovations AB (TRIAB), "The efficiency of the Speed Oven design, which combines infrared and convection heating, has doubled their previous line speed without increasing floor space. Osby is now using environmentally sound powder coatings, eliminating the worries of volatile organic compounds (VOCs)."

"High-purity infrared wavelengths produce a higher quality finish in less time because the pinhole and eggshell effect which can occur with conventional drying techniques are eliminated. With the growth of powder coatings in the automotive, industrial finishing, and converting industries here and abroad, IR technology is particularly appropriate," explains Fusilli.

Oven systems have also been installed at the Buick City assembly center in Flint and at the Orion Center in Pontiac, Michigan. Both facilities are in the process of converting their two-coat finishing operations from a solvent-based color paint to a water-based color paint. In two-coat finishing, the base color coat is followed by a clear top coat. In both stages of the operation, tighter environmental regulations are discouraging the use of solvent-based paints and coatings.

"With sources within the automobile industry predicting the widespread transition from high solids to powder clear-coats by the mid-1990s, and the simultaneous phasing in of water-based paints for use in the base coat, indications are that infrared drying and curing systems will be increasingly employed by car manufacturers worldwide," continues Fusilli.

The system is a combination electric infrared and high-velocity hot air drying unit designed for drying complicated parts—such as automobile car bodies, both outside and inside and will be used on the plant's two-tone line where paint areas must be dried.

High purity electric infrared emitters dry automotive paint faster, more uniformly, and at lower ambient temperatures than conventional drying systems, yet provide a superior, more durable finish. The IR emitters—twin quartz tubes with integral gold reflectors—can be "fine-tuned" throughout the medium infrared spectrum (2.3 to 3.3 microns). This feature allows energy to penetrate through the upper boundary layer of the coating down to the interface of the coating and the substrate. Gold reflectors direct nearly all the infrared energy to the target.

Osby is now able to fully cure an epoxy/polyester powder in seven minutes and increase its line speed to 13.1 feet/min. The IR process produces a high-quality finish with corrosion resistance that is far superior to that of existing wet coatings.

Regulations restricting emissions of VOCs have forced many European companies like Osby to reconsider their choice of coating type and application method. They have long favored solvent-based coatings because of quick cure times. Today, however, besides VOC regulations, the insurance and storage costs of maintaining a dangerous solvent inventory and the subsequent incineration costs often outweigh the production benefits of a faster cure.

As alternatives to solvent-based coatings, dry powder and water-based coatings are much more environmentally friendly. In conventional convection ovens, however, they require considerably longer cure times than those of solvent-based paints. In considering a switch to a powder-coating process, Osby faced a potential bottleneck at its ovens that would have significantly reduced its production rates.

The solution to this dilemma lay in changing the curing process, as well as the coating method. The production line was completely overhauled, with infrared Speed Ovens installed both at the water dry-off and curing stages. Also, a heated flash enclosure, which uses preheated air from the curing oven exhaust, was integrated into the system.

TRIAB, the European manufacturer of these IR ovens, also revamped the control system for the five-stage phosphate washer, supplied two powder booths for quick color-change capability, and installed a PLC-based control system to run the entire Osby operation.

Lars Karlsson, TRIAB’s technical and marketing director, emphasized the flexibility offered by the new system. "Osby wanted to have the option of using a wet paint for certain parts, so we left the existing wet spray booth in place. The two powder booths will also enhance their productivity."

These jointly designed, manufactured and marketed heating and curing systems serve the industrial finishing, automotive finishing, converting, and automotive electronics markets worldwide.