Benefits of Energy Curing

Energy costs and the environment are hot news items and the focus of political debates worldwide. This article examines some of the benefits that energy curing technologies — specifically electron beam (EB) and ultraviolet light (UV) — can provide the adhesives and sealants industries.

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OPERATING COSTS

With today's increasing utility costs, the relatively low operating cost of using EB and UV technologies offers companies in the adhesives and sealants industry a way of stabilizing their utility costs.

As an example, the table shows the utility costs of curing an EB-formulated coating on a 54" wide line, running at 1,000 feet per minute. The total cost is less than $17 per hour.

Along with relatively low operating costs when in use, EB is an "instant on" technology. Conventional ovens require a warm-up period to reach optimum drying temperatures and air turbulence. So, even at idle, users of conventional drying technology are spending considerable sums in energy costs while no product is being produced. In contrast, EB technology in idle mode uses almost no energy.

ENVIRONMENTAL IMPACT

While low operating costs are important in day-to-day operations, another consideration in today's market is the impact on the environment. If viewed from an environmental-impact perspective, the use of heat in the drying of solvent-based products usually produces volatile organic compounds (VOCs). To reduce the amount of solvents and VOCs that are produced during manufacturing,

companies install incinerators to burn off VOCs. These incinerators use even more energy to accomplish their task.

What's more, many national, regional and local governments are in the process of enacting legislation to limit the release of VOCs into the environment. However, EB and UV formulations normally contain no solvents or VOCs. By eliminating VOCs, such devices, regulatory compliance and associated expenses are not necessary.

SAFETY HAZARDS

Besides being environmentally unfriendly, solvent-based chemistries run the risk of explosion. As such, they can be a safety hazard. Since EB and UV chemistries contain no solvents, there is no explosion hazard making them safer for plant personnel.

One other advantage of EB technology is its relatively compact size. Today's low-voltage EB equipment is designed for installation on new and existing presses and coating lines.

Table. Utility Costs to Cure an EB-Formulated Coating

Electrical Consumption	
65.6 KWH x $0.08 / KWH	$5.25/hr.
Cost/hr.	$5.25
Nitrogen Consumption Estimate	
3,800 scfh x $0.30/100 scf	
Cost/hr.	$11.40
Total Operating Cost Per Hour	
Electricity	$5.25
Nitrogen	+ $11.40
TOTAL	**$16.65**

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