UV/EB Corner

EB, a Bright New Future for 2003 and Beyond

Editor's Note: UV/EB Corner, a feature created in conjunction with RadTech and written by its members, highlights what's new and exciting in the field of graphic arts.

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Electron beam (EB) technology has several new offerings for 2003 and beyond.

The year starts with a dynamic new EB curable liquid ink for use on CI flexographic presses and eliminates the need for inter-station drying. EB curable paste inks have been around for quite a few years for use on web offset presses. Typically these presses are printing on folding carton board stock for food packaging to be used in cereal boxes, prepared frozen food containers and ice cream containers. EB inks have been used in these areas due to the superior properties they deliver, such as high gloss, tremendous resistance to scratch and scuffing abrasion along with emitting no or very low odors.

Today, converters using CI flexographic presses can take advantage of the long accepted high quality of EB curable inks. The inks are laid down wet-on-wet without drying at each print deck. Instead, the inks are all dried instantly with an EB curing system. This new process brings a number of advantages to the converter, including:

- No solvent incineration
- No VOCs
- Reduced health risks to employees
- No heat to the substrate
- No/low extractables
- No/low odor emissions
- No photoinitiators
- Instant drying of all inks in line
- The ability to print and do in-line laminations.

But there is more to EB processing than the introduction of wet-on-wet CI flexo inks. EB is used in flexible packaging to cure overprint coatings with properties strong enough to replace a layer of film. Replacing laminated structures with a single ply film and an EB 'top coat' delivers significant savings to the converter and the end-user alike. EB-cured coatings provide the oft times desired properties of high gloss, no to low odor emissions with high resistance to scratch and scuff abrasion while maintaining a consistent and manageable COF (coefficient of friction). In applications where EB coatings are used to replace laminations, they can yield significant savings in material cost.

EB Coatings vs. Laminations

Replace Two-Ply Laminations with Monoweb and EB Overprint Varnish

Assumptions:

Product Width	36" Wide
Production Hours	4,000 hours per year
Line Speed	500 feet per minute
Total Annual Production	51.8 MSI

	Current Structure	Proposed Structure
	50G BOPP/RP/ADH/1.4 Mils BOPP	2.0 mil. BOPP/Surface Print/EB OPV
	$ per 1,000 Square Inches (MSI)	$ per 1,000 Square Inches (MSI)
Cost of 50G and 1.4 Mils OPP	$0.1207	--------
Solvent-Based Adhesive	$0.0100	--------
Cost of 2.0 Mil OPP	-----	$0.1000
EB OPV @ $4.00/lb and 1.8 lbs/ream	-----	$0.0160
Total	$0.1307 per MSI	$0.1160 per MSI
Total Cost per Year	$6,770,260	$6,008,800
Net Savings per Year		$761,460

EB Overprint Varnish provides:
High Gloss
High Scratch and Scuff Resistance
No/Low Odor or Extractables
Consistent and Stable COF

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The chart on page 16 provides an example of these cost savings.

In addition to the material savings realized from replacing a layer of film, there are the cost reductions realized from streamlining the printing and converting process. Many laminated structures take days to complete. EB cured coatings are processed instantly in-line thus allowing the converter to print and ship the product in the same day.

For situations where a laminated structure is absolutely necessary in order to provide barrier characteristics, EB instantly-cured laminating adhesives provide significant benefits to converters.

EB-cured laminating adhesives eliminate the multi-step process of printing, storing, laminating and storing a product yet again before it can be shipped. EB laminating adhesives cure instantly and thus permit the converter to:

- Print
- Laminate in line
- Test for quality control
- And ship out the door, all in the same day.

In addition to radically reducing the need for work-in-process inventory, the instant cure process permits the converter to laminate to the edge of the structure and get more usable product from the same size stock. One key attribute of EB laminating adhesives is that they do not contain potentially dangerous aromatic amines.

The diversity of electron beam processing continues to grow in the flexible packaging marketplace. The factors behind this current and future growth of EB technology are the smaller size of current EB systems and their significantly lower investment requirement. Not too long ago, the difference between EB and other energy curing technologies was rather large. Today that gulf has diminished to the point where EB is now a reachable technology for large and small converters alike. The lower price point coupled with the vast offerings from the chemistry supply chain make EB shine brightly as the converters best choice for profit and growth…today and beyond. ■

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