Energy-Curable Printing Blankets: An Overview

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Demand for UV printing is rising in excess of 20% per year. Many press manufacturers are shipping more than 20% of new presses as energy-curable versions. Due to the ever-changing and demanding government regulations in the United States and Europe, especially concerning air quality, the demand for energy-curable inks and coatings in the printing process certainly will continue to grow. Many industry analysts think this percentage will grow even faster as the demand for greater surface finishing and effects is achieved through the UV/LED printing and coating process.

The benefits of UV/LED printing, such as higher gloss, protective qualities and scuff resistance, make it superior to traditional print products. The surface finishing effects that can be achieved are almost unlimited. Additional benefits in the printing and postpress include the absence of spray powder, delivered dry and ready for finishing. These benefits make it the preferred process for the packaging industry that depends on the package to promote the sale. Also the lowered VOC emissions are becoming a much bigger factor in determining to go to an energy-curable system.

The primary downside for a printer desiring to get into the radiation-cured market is the expense of converting their existing equipment to make it suitable for UV/EB or LED/HUV or buying new presses that are already equipped for UV/EB or LED/HUV. In addition to this, the printer must learn about the different chemistry required for the different types of radiation type curing, such as fountain solution, washes and inks. The printer also must find rollers and blankets that can withstand radiation-cured inks and washes, as well as produce printed material to the same high quality as traditional printing.

So where does the printer go to find this information? Typically, the only resource is the sales and technical representatives of the UV/EB or LED/HUV product and equipment supplier. If you do a search on the web, most sites you will see are for manufacturers' products, which will only tell you the benefits of their particular products.

Additional resources for the printer could be organizations that research and/or test products, such as RadTech or PIA/GATF. Some may be able to benefit from other printers with whom they network. Should a printer have access to a large number of energy-curable users and request their recommendations for a blanket best suited to this application, the printer will be amazed to find they range from standard printing blankets to

Quick summary

Select blankets suitable for use with UV/EB inks and press washes.

Remember: Printability, as well as chemical resistance, has to be considered. EPDM is chemically resistant but doesn't always have the best printability. Compromises between printability and resistance properties will have to be made.

If blankets swell by more than 10% when immersed in UV/LED-type inks or the press washes needed for these inks, they should not be used.

If the blanket shrinks by more than 5% when immersed in the UV/LED-type inks or press washes needed for these inks, they should not be used.

Proper blanket installation is often overlooked, yet it can have a major impact on printability. Make sure the proper procedure is used for setting torque readings when mounting blankets.

some version of EPDM rubber surface compounds. EPDM, which is short for Ethylene-Propylene-Diene-Monomer, is a rubber compound that works well since it withstands the effects of UV- and LED-type chemistry. However, EPDM rubber is not usually suitable if the quality demands are very high. Many printers will opt for using a blanket typically recommended for standard conventional printing in order to maintain acceptable print quality. The drawback is that conventional rubber can break down, degrading print quality and requiring new replacement blankets more frequently, thereby increasing expense.

Most of the blanket manufacturers are working to refine a blanket surface compound that can yield excellent print quality and resist the chemistry of the radiation cure process. Many have developed some combination materials that are improvements over a straight EPDM compound, but it may still come down to what trade-offs the printer is willing to make. Most blanket manufacturers will tell you there is no perfect blanket for any print process.

What can a printer do in the selection process? One of the most important things a printer can do is have tight control over the testing of any product. Suppliers can make recommendations

that will get the printer started. One step that can help in the blanket selection process is to have the blanket tested for swell rate using the chemistry and inks the printer is currently using. If the swell rate is more than 10% of the blanket's total thickness or if the sample shrinks by more than 5%, the sample should be eliminated from the test or placed way down the list of possible candidates. Many blanket manufactures can offer a compatibility test method, but using an independent testing site can reduce concern about product bias.

When the printer has selected some blankets ready for trial, then the test variables should only be blankets. No other product should be changed or modified during the testing. A list of the most important criteria should be made and each measured and recorded in a clear manner during the process. Everyone involved must be completely versed on the testing, information needed and how it is to be gathered and recorded. When the testing is complete, a review of the results should give the printer the best options. Note that the least expensive blanket may not be the best alternative even when the printer knows blankets will be changed often.

There is one area that can help any printer and is often overlooked – proper installation of the blankets. In one PIA/GATF blanket study, which purpose was to determine effects of different surface finishes on dot quality, it was found that when print pressures were consistent, the biggest contributor to print changes was proper torque procedures. By changing the torque amount and procedures, the dot gains – as well as other quality factors, such as release and register – were adversely impacted. By using the proper torque numbers and procedures, the testing can be better controlled. Using torque procedures as standard operating guidelines, the printer will get the best results a blanket can yield whether the decision is to use a conventional or EPDM compound. Below is a suggested torque procedure:

1. Initially install the blanket and packing using the torque wrench to tighten.
2. Place the press or unit on impression and rotate the cylinders several times under pressure to push any slack towards the tail end of the blanket.
3. Before releasing the impression, use the torque wrench to tighten the tail end of the blanket.
4. After a thousand impressions or a stop during the press run, retighten the blankets an additional time to take up any slack that may have developed as the blankets are run in under operating pressures. Note: It is not necessary to do steps one, two or three during this part of the procedure.
5. One additional note: When the wrench clicks, stop tightening. It has reached its torque setting.
6. The blanket is now as tight as it needs to be in order to operate at maximum performance. If the operator uses the torque wrench again after a period of operation, the blanket may draw down some more, but it does not indicate a loosening or stretching problem. The blanket can actually work best if it is not overstretched. There should be no need for additional tensioning unless a print problem indicates a loose blanket.