

UV & EB PROCESSES CONTINUE TO MAKE WAVES

Have you taken a look at UV/EB curing lately? Maybe you should. Ultraviolet and Electron Beam curing is everywhere. The technology is mature and yet it's a technology of the future.

Quoting Radtech, "Each day you likely walk on, handle, eat and drink from, look through and read from and benefit from this exciting technology." UV/EB have indeed become the processes of choice for numerous applications with many more on the way.

Why the process of choice? Consider some of the latest news:

- *The Hartford lowers insurance premiums for UV/EB users.*
- *UV screen printing named BACT.*
- *UV wood process also named Best Available Control Technology.*
- *Green technology gains landmark exemption from clean air permitting as EPA rules the technology not only reduces but also essentially eliminates emissions.*
- *South Coast Air Quality Management District (CA) allows immediate installation of UV/EB processes without lengthy permit requirement.*

Radtech International North America at their attendance and exhibit record setting biennial conference held during April in Baltimore, MD reported on the status of UV/EB curing in North America. The report was based on feedback from a sizable number of member raw material suppliers, equipment suppliers, formulators and some end users. The exciting news is that both Ultraviolet light and Electron Beam curing processes continue to grow at good rates. The consensus was that the growth volume in 1999 was 10%. Expressing growth as a percent doesn't mean a whole lot until you see the volume expressed by weight or dollar value. Volume by weight has grown 31% since a previous survey conducted in 1996. A compound growth rate of 9.3% was achieved with volume in 1999 reaching 71,000 metric tons (2,200 lbs each) of formulated UV/EB curable products. That is indeed an impressive number for an industry that prices product by the pound or kilo.

Future industry growth, 2000-2005, is projected to equal and perhaps exceed the growth recently achieved.

Markets reporting this growth include:

- *Graphic Arts Paper, Film, Foil & Board*
- *Wood Finishes*
- *Plastic Coatings*
- *Silicone Release Coatings*
- *Adhesives*
- *Metal Decorating*
- *Metal – General*
- *Optical Fiber*
- *Printing Plates*
- *Stereo Lithography/Solid Modeling*
- *Dental Applications*
- *Medical Apparatus*
- *Electronics*

Both fiber optics and computerized solid modeling are enjoying very high rates of growth. New segments that are growing rapidly are pressure sensitive and optical adhesives, automotive applications and UV curable powder coatings. Accelerating growth is also expected from ink jet process inks and medical device applications.

Future growth 2000-2003 is forecasted to be between 8-10% considering both UV/EB formulated products and equipment sales.

Significant advancements in UV/EB chemistry and equipment have been made. Lower cost monomers, oligomers and photo-initiators have become available due to increased competition, and some expiring photo-initiator patents. New multi-functional monomers offer lower viscosities and a further reduction in skin irritation potential.

Equipment has been improved with more powerful UV lamps (600 W/in) becoming commonplace. UV lamp (IR) generated heat has been brought under control with dichroic filters combined with efficient air or water-cooled reflector housings.

Why should you be interested in UV/EB as a potential user? When you think about it you will probably find that you will have motivations similar to those reported by the Radtech study. These were ranked as follows:

1. *Increased production speed/fast cure*
2. *Improved product performance*

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3. *Environmental compliance*
4. *Cost effectiveness*
5. *Product resistance*
6. *Cool curing re: heat sensitive materials*
7. *Reduced energy requirements*
8. *Ease of use*

The impact of new developments on the growth of the industry was assessed and ranked in order of importance as follows:

1. *Clear coatings with exterior durability*
2. *Wide web flexo inks*
3. *Pressure sensitive adhesives*
4. *Pigmented exterior coatings*
5. *UV curable powder coatings*
6. *Sprayable UV curables*
7. *Opaque pigmented coatings*
8. *Lower voltage EB processors*
9. *Eximer lamps*

Recent advances in chemistry & equipment that might interest you were reported by the industry to be in order of importance:

1. *Cost of Chemistry*
2. *Improved Photo Initiators*
3. *Less Toxic Oligomers and Monomers*
4. *Lower Viscosity Oligomers and Monomers*
5. *Improved Customer Acceptance*
6. *Higher Intensity Lamps*
7. *Reduced Odor*
8. *More User Friendly Equipment*
9. *Better Heat Control*

New Markets for UV/EB were ranked in order of activity reported as:

1. *Pressure Sensitive Adhesives*
2. *Wide Web Flexo Inks*
3. *UV-Cured Powder Coatings*
4. *Ink Jet Inks*
5. *Clear Coatings - Exterior Metalized Plastics*
6. *Gravure Inks*
7. *Clear Coats - Exterior Automotive*
8. *Magnet Wire Insulation*
9. *Exterior Coil Coatings*

Markets expected to enjoy the highest growth rates in 2000 were in order of rank:

1. *Ink Jet Printing*
2. *Medical Devices*
3. *Fiber Optics*
4. *Solid Modeling/Prototyping*
5. *Adhesives*
6. *UV Cured Powder Coatings*
7. *UV Flexo Inks and Coatings*
8. *Automotive Applications*
9. *Plastic Coatings*
10. *Electronics*

The North American UV/EB market consists of tens of thousands of UV curing installations and several hundred EB lines. The consensus of the reporting panel is that 90% of the total volume of UV/EB chemistry products is UV chemistry. 90% of the volume is used in the U.S., 7% in Canada and 3% in Mexico.

The UV/EB chemistry mix currently used is estimated to be 86% Acrylates, 6% Cationic Epoxies, another 6% Unsaturated Polyesters and 2% other Chemistry.

Check out UV/EB and see if one or the other is not the technology for you, and check out Cork for know-how and all of your specialty coating, varnish and adhesive needs.

Whenever you consider UV/EB, consider CORK!for expertise in formulating.

LOOK TO CORK!..... for all of your coating and varnish needs, for both aqueous & UV/EB coatings and varnishes.

Credit to RadTech International N.A. "Status of UV/EB Curing in North America—2000"

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