

UV/EB MISCONCEPTIONS FADE AWAY

The twin energy curing technologies ultraviolet (UV) and electron beam (EB) have shown a history of encouraging growth over the past three decades.



Equipment placements have accelerated, as has the use of formulated consumables: inks, coatings, varnishes, and adhesives, etc. Continuous improvements in all have led to new and different value added product applications.

The UV sector especially has seen strong growth in a variety of industries but particularly graphics arts. EB, while trailing UV in overall growth, has also had a growth spurt especially in food packaging.

Adoption of energy curing has occurred to such a degree that while many of us continue to refer to them as “new technologies” they hardly qualify for that label today. However, they surely continue to qualify to be described as “leading edge technologies”.

In spite of vigorous UV/EB industry growth there continues to be resistance from some potential users to consider the benefits of UV/EB for many applications that could benefit. As with any technology that attempts to replace established technology, there are half-truths and arguments that persist as resistance to change.

What are the misconceptions that sometimes surface when UV/EB is considered?

UV/EB benefits don't overcome the negatives.

Those that will argue this point are simply in denial. The fact is that energy curing UV/EB technology is the fastest growing segment of new equipment and press acquisition. UV/EB technology is growing based on system merits including, end product quality

improvements, productivity improvements, consistency of cure, cost improvement, and improvement from an environmental viewpoint. It may well be argued by some that UV or EB is not for everyone and the UV/EB industry agrees that care must be taken in making the election to choose energy curing as a process. Prospective users need to carefully study their production and customer requirements for viability. Without doubt, adopting UV/EB involves a learning curve, as does the adoption of any new or different technology. But factually, so many have gone on before that the learning curve is not steep, except for the newest of leading edge, not been done before, applications. It's also a fact that most adopters soon learn that the benefits are convincing and they add additional capacity.

Summarizing, it can be said that energy curing is more and more the choice of industry that wants to move ahead, fully recognizing a technology that is cost effective, offering end product and productivity improvements, while being easy, clean and safe to use.

UV/EB equipment is too expensive.

In the beginning, as with any new technology, the innovators, industry leaders or first adopters tend to pay for the advances. Look at any consumer electronic products, TV, VCR, CD and DVD burners, HDTV, PC's, etc., Consider the extremes in price history, very high price beginnings and the later very competitive mature market pricing. Similarly, UV/EB equipment and consumables technology has advanced to offer better value today vs yesterday. UV and EB equipment both can compete very well vs comparable conventional equipment. Cost should always be evaluated against return. Benefits include, new end product types, improved properties, higher line speeds, lower VOC's, less waste, and improved productivity, etc, etc. Mature UV

equipment manufacturers offer more for the money than ever and more recently EB equipment has been advanced very significantly in size reduction and capability, while seeing costs halved.

Formulated Consumables: UV/EB coatings, inks, varnishes, adhesives, etc. are too pricey.

Again, an immature technology always costs more in its infancy. However, while products, and applications of these consumable products continue to change and new products emerge, the fact is the technology is mature and costs are competitive. Sure you can look at price per pound of coatings, inks and adhesives, etc. and in comparison to conventional products initially, see some sticker shock, but? But, you have to look further at such things as percent solids, efficiency of use, waste, pollution control, end product benefits, etc. For example, when properties are assessed, it is often found that a thinner UV/EB film thickness (less product-greater mileage) is required, to obtain the same results as previously used solvent and water based products, reducing applied cost. Additionally, one must look at value added improvements such as increased gloss and, abrasion-scuff resistance, reduced (sharper) dot gain and overall improved end product performance. Further, consumables do not dry by evaporating components but need to see UV/EB energy to cure eliminating daily application equipment cleaning. This not only reduces waste but also prep time.

Unsafe UV/EB consumables and equipment

In the beginning, when UV curing was first promoted, thirty to forty years ago, some of the then available raw materials used in formulating could cause dermatology (skin) problems (rashes). The technology has now progressed to where these types of irritations should (almost) never affect users. Today, formulators of UV/EB consumables have the ability, with the raw materials available, to formulate consumables with extremely low irritation potential. However, as with most industrial chemicals, manufacturers of these products recommend that users utilize eye and skin protection as a safe handling precaution. It pays to keep in



mind that these energy curing UV/EB formulated products do not cure (dry) without seeing adequate energy levels. Dry is the operative word, because as long as the products are wet (uncured), they can be transferred inadvertently and cause skin-sensitivity issues in susceptible people. Safe handling procedures/policies are a must for any UV/EB facility and its personnel.

UV/EB formulated products are safe. They are 100% solid. Their use produces zero-low emission levels. Further, since they contain no solvents there is no explosion hazard.

Considering equipment and safety, one of the components of UV light emission is bright, white light, approximately 50% of a lamps output, combined with 30% UV light and 20% infrared. Proper equipment light shielding prevents operator exposure to the curing zone. Similarly, EB equipment is designed with shielding to prevent operator exposure to the enclosed, locked out curing zone.

UV curing lamps also produce a limited amount of potentially irritating ozone, mostly in start-up. Ozone is extremely unstable and dissipates rapidly. Effective exhausting is a component of any UV equipment design, further eliminating any health risk.

Wash-up of UV/EB formulated products can be accomplished fairly effectively using soap and water. When other wash-up solutions are recommended it is possible to find very safe, low VOC products to use. Nevertheless, from a safety viewpoint, proper care and safe handling procedures should be established and practiced in any using facility.

When all of these factors are thoroughly considered, any negative initial impression should disappear. After all, the playing field is more than level and competitive.

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