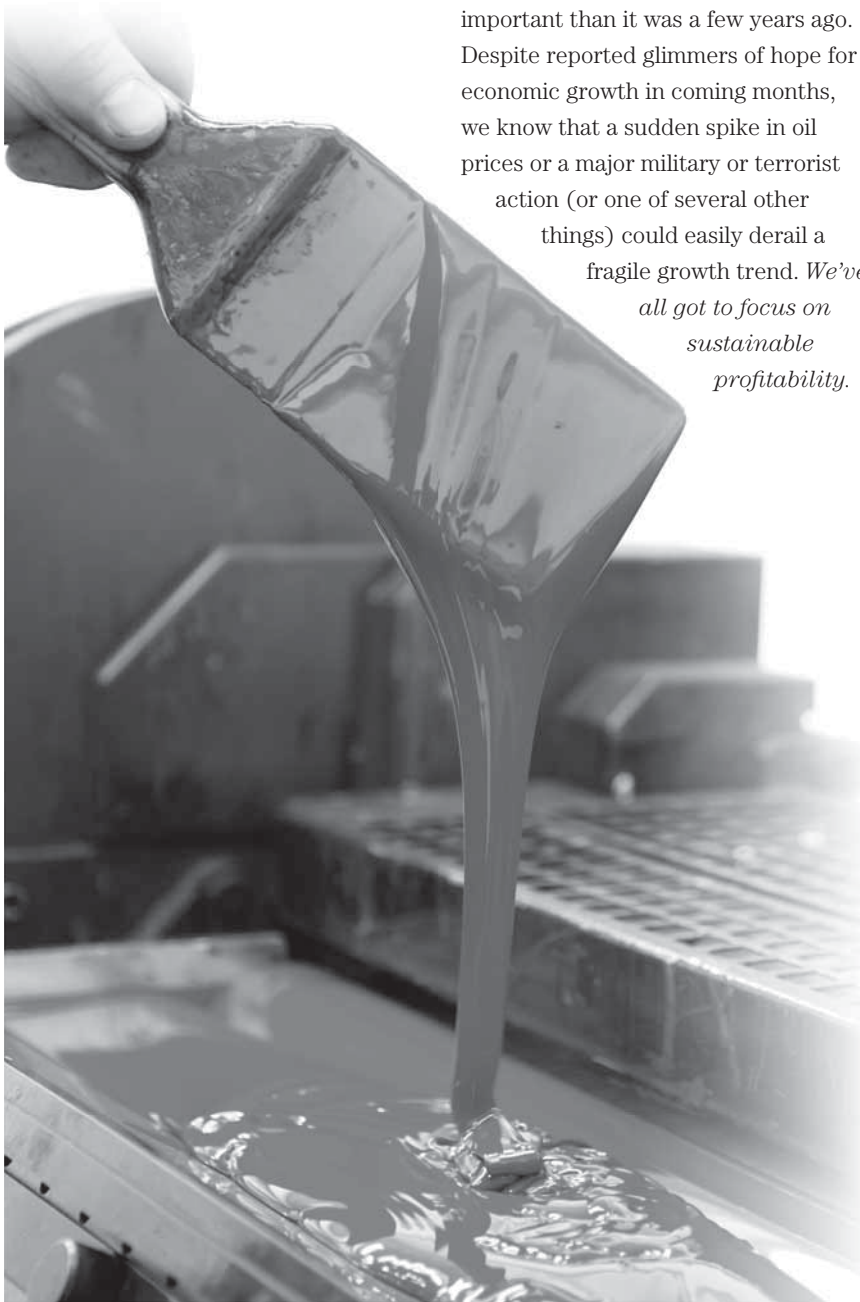


# Value, Savings and Profit in UV/EB Printing

By Don Duncan



Everybody wants to hear how to make a buck or even how to save a buck. With cost-cutting and basic survival at the forefront of everyone's minds, this is even more important than it was a few years ago. Despite reported glimmers of hope for economic growth in coming months, we know that a sudden spike in oil prices or a major military or terrorist action (or one of several other things) could easily derail a fragile growth trend. *We've all got to focus on sustainable profitability.*

For now, let's narrow the discussion to making a buck in UV/EB printing. In times of cost-cutting and survivalist thinking, here are some obvious questions to ask:

- Why buy inks that cost more than "conventional" inks?
- Why spend a lot of money on UV or EB curing equipment?
- How do you economically maintain the complicated curing hardware?
- What kind of jobs will cover the overhead cost?
- Can I afford to? Can I afford NOT to?

These questions need good, solid answers. I need to insert here that I am an ink guy and that I give answers to these questions from my perspective all the time. For this discussion, however, I interviewed a lot of people who are putting these things into practice every day and I compiled their answers. The cynical might see this approach as creating a facade of objectivity, but I have tried very hard to report the results simply and without excessive personal commentary.

The feedback fell into one of four major categories:

1. What we all know.
2. What the ink companies say.
3. What hardware suppliers say.
4. What printers say.

*One thing that was crystal clear was that choosing the right print technology varies with each situation.*

## What We All Know

There were several items where all respondents were in uniform agreement. These almost fall into the “common knowledge” area, especially to those who have operated in the UV/EB arena for a few years. Here are the generally well-understood facts about UV/EB printing:

- UV/EB inks and graphic arts coatings usually have essentially zero-VOC content.
- UV/EB inks and coatings see widespread use in food packaging.
- UV/EB gloss coatings have the highest gloss available for press-applied coatings.
- UV/EB coatings and some inks have very high rub resistance.
- UV/EB inks and coatings can have the best chemical resistance available in print.

These are all good things. It is rare enough to have broad agreement on five issues relative to a single technology. When all five of these issues are positive, it should catch our attention. We're off to an encouraging start.

Here are another 10 issues that see general agreement. Not all are as clearly positive, but most are. More importantly, there don't seem to be any real showstoppers on the list.

### UV/EB Inks and Coatings...

1. Have very low residual uncured content in the cured film.
2. Give essentially instantaneous cure and can be used right off the press.
3. Are not suited for the very fastest press speeds, but are okay.
4. Require an energy to cure between layers for water/solvent inks and for oil-based litho inks.
5. Use raw materials that are mostly petroleum-derived.
6. Usually give very good print quality and low dot gains.

7. Require no spray powder (versus oil-based litho).
8. Can score and cut in-line, requiring fewer processing steps.
9. Produce no hickeys or ink skins (versus oil-based litho).
10. Will stay open in fountains and on rollers until cured by UV/EB energy.



## What Ink Companies Say

I and my “inkie brethren” can be relied upon to say things like this to printers:

- Tell us what kind of ink you want, we've got all kinds.
- You made the UV/EB decision, we'll help make it work.
- We'll support you with regulatory, safety, performance and technology information.
- We'll help you tell the story to your customers and to regulatory/permitting agencies.

There's a theme here. The ink supplier is in a supporting or advising role, and is not the decision-maker about what kind of press to buy. Also, most printers expect ink suppliers to help with regulatory information and performance development, and also to manage cost proactively so that both the ink supplier and printer prosper. These are things that are well understood by ink suppliers.

## What Hardware Suppliers Say

Manufacturers of UV-curing systems and EB-curing units (we usually call them “Lamp and Beamer guys”) are highly segmented within their own technologies. The technologies compete and sometimes compete head-to-head. Civil discussions between the two camps can be had, but they both have to work hard at it.

*Lamp guys will tell a story supporting the initial premise of “Here's why UV is better.” The story usually involves these topics:*

- Lower cost installations.
- UV/oil (litho) operating flexibility (going back and forth).
- Capability to do sheet-fed printing (litho).
- Capability to do flexo.
- No nitrogen-inerting requirement.

*Beamer guys also have a good story to support their premise of “Here's why EB is better.” These items are usually part of the story:*

- Simplicity of installation and maintenance (only one unit to worry about).
- Lower residuals levels in cured film (for food packaging).
- No need for expensive photoinitiators in inks and coatings.
- More reliable curing and at higher conversion rates.
- Turn it on and run it—less day-to-day maintenance and cleaning.

If a balanced, objective view were available from a hypothetical hardware supplier that made both technologies for the printing industry, I suspect that slight advantages and disadvantages from each curing technology might be easier to identify. However, the practical observation in the real world is that there are multiple suppliers of both technologies; they both are successful where they are used; and

printers use both and buy the curing technology that is optimal for the specific need at hand. This leads directly to the next section.

### What Printers Say

The printers with whom I spoke were all very open, candid and helpful about pluses and minuses of the different technologies. Their words are listed below without elaboration. The comments are divided into specific technology subsections:

#### Flexo—UV versus Water

- UV flexo has better print quality.
- UV flexo requires few-to-no press-side adjustments.
- UV flexo causes less waste—you can reuse ink off the press.
- UV/EB gives better mileage—“sitting up” rather than “soaking in.”
- UV flexo has better gloss.
- UV flexo has better adhesion to foil substrates.
- UV flexo has better print control on process colors due to sharper dots.

#### Sheetfed Litho—UV versus Oil

- UV litho allows floor space for production rather than having pallets of oil-based print drying.
- UV litho gives significant competitive advantage in lead time requirements.
- Shorter lead times allow competition in international markets.
- UV litho allows a rapid replenishment cycle.
- UV inks bought in volume are similar in cost to oil.
- In terms of print product cost, paper is No. 1, labor is No. 2, and ink is near the bottom.
- UV litho makes fewer print rejects than oil-based litho (ghosting, scumming, tinting). This saves paper cost.

- UV gloss coatings over oil inks don't work well.
- Blankets and rubber rollers that can run oil and UV offer great flexibility.
- The primary use for oil-based litho is on legacy equipment.
- Printing work-and-turn is easier and faster with UV.
- Oil-based ink and water-based coating (including drying time) is break even with UV.
- UV litho has lower VOC content than oil.
- With more print business up for bid, the need to respond fast and be flexible is critical.
- Matte/gloss combo graphics are easier with UV.

#### Web Litho—UV versus EB

- EB coatings allowed elimination of wax coatings for frozen food packaging.
- EB is a cooler (meaning temperature rather than fashionable) curing process than UV.
- EB gives lowest odors for food packaging, but UV is still widely used.
- Web EB is not very flexible—print cassettes and rotary dies are very expensive.
- Web EB is great for long runs with limited carton sizes.
- Web EB has much faster throughput time than oil and is somewhat faster than UV sheetfed.
- EB coatings provide significant substrate protection during freeze/thaw cycles.
- The mixture of EB web, UV sheetfed and oil sheetfed makes a very flexible plant.
- The choice of printing process is more about the fit of a job to the equipment than about the ink.

### Conclusions

The distillation of these comments seems to come down to two major themes:

#### • Production

UV/EB seems to be known for printing efficiency, waste reduction, pressroom flexibility and improving response times.

#### • Product Quality

UV/EB is reported to give sharper dots, higher gloss, significant substrate protection and very good rub and chemical resistance.

The primary areas where UV/EB printing is now used seem to connect very tightly with these themes. The largest use areas for UV/EB include, in no particular order:

- Food packaging
- Greeting cards
- Lottery tickets
- Retail packaging
- Labels
- Shrink packaging
- Flexible packaging
- Direct mail

The cost comments from printers show that ink is near the bottom of their cost burden. However, all ink suppliers know that “near the bottom of their cost burden” still leaves ink as a very visible part of their cost burden, about which printers are vitally interested. Still, we have seen that UV/EB printing provides flexibility, efficiency and responsiveness. We also know that UV/EB printing is still growing. Beneficial properties and the practical knowledge that printers are still buying into the technology makes it sound like a good place for growth. ▀

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