

A Silgan Plastics White Paper

8 top decorating techniques: capabilities you should know

Tim Monacella
Manager, Decoration
Silgan Plastics

Brand owners have a broad spectrum of decorating technologies to choose from to support their marketing initiatives. Making the right choice will depend on a variety of factors starting with the container size, shape and material. Other important variables include container volumes, product category and formulation, equipment speeds, amount of information that needs to be communicated to the consumer, environmental issues, capital expenditures and inline labeling requirements.

The objective of this white paper is to highlight some of the more recent developments in decorating. It will also provide you with information to assist you in asking the right questions with regard to your next project.

1. Direct screen printing

Screen printing is one of the most widely used forms of bottle decoration. Brand owners and consumers like the “direct print” format which prevents graphics from falling off the container in use. This is ideal for personal care applications which are subject to wet or humid environments.

Three- and four-color line copy has been the default standard for the majority of packaging applications using this technology. However, improvements in equipment capability are about to shake things up.

The latest screen equipment, which is currently entering the United States, will make printing with additional colors and higher registration, more viable. With the use of laser-generated screens, these new rotary units can print six-color process work while holding the dots in very tight, pinpoint registration. The jagged edges you typically see under magnification with screen printing will start to disappear. This will result in improved photographic quality, crisper copy and graphics that will pop on the shelf. This latest silk screening capability will be a big plus for brand owners who continue to look for ways to enhance their shelf appeal.

Beyond improvements in print registration and color capability, we also can expect better line efficiencies. These new units will be able to run oval or round bottles at speeds upward of 100 per minute. This means the capability and speed gap between labeled and silk-screened bottles will continue to narrow.

Another consideration is environmental impact. Unlike many other decorating techniques, silk screening has no scrap. There is no liner paper or scrap from die-cuts that needs disposing. Work also continues on improving ink formulations. Today’s inks tout carbon footprint reductions by as much as 20%. Additionally, soy-based alternatives further minimize dependence on petroleum-based products.

Continued developments in lower-voltage LED lamps will reduce the electricity necessary to cure inks further improving the environmental impact of screen-printing. Although the current microwave “instant cure” lamps use less energy than the traditional oven-cured systems, the LED approach will lead to much lower electrical consumption.

2. Pressure-sensitive labeling

The current focus in pressure-sensitive (PS) labeling is on the material itself. PS materials are typically made from either high-density polyethylene (HDPE) or polypropylene (PP) coextrusion blends. The structures can be uni- or biaxially oriented, as well as cast film.

With liner carriers as thin (1 mil) as they are likely to get in the near term, the label is now at the center of attention. The objective is to see how much resin can be removed from the structure to positively impact cost.

The standard thickness has been in the neighborhood of 2.5 mils, with testing currently being done on gauges ranging from 1 to 1.5 mils. However, the challenge is making sure that thinner label stocks can still meet performance criteria. Down gauging the material can potentially make it harder to control when applied and therefore runs a higher risk of flawed application such as wrinkles and darts.

The adhesive used in conjunction with pressure-sensitive labels is another area where work is being done. Typically, containers coming out of the blow molder have to cool for a period of time (approximately 20 minutes with forced cooling) before being labeled due to adhesive, material limitations and bottle shrinkage. Adhesives are currently being worked on which have higher-heat tolerance. This will enable the cooling time to either be shortened or eliminated.

Assuming the label stock/adhesive combination is forgiving enough to accommodate the slight shrinkage of the container during cooling, then labeling could take place in line, immediately after the containers exit the blow molder. This would eliminate the need to move the bottles to a secondary operation, resulting in both time and labor savings.

PS labeling equipment is another area where improved capabilities are being developed. One limitation of PS labels has traditionally been the inability of the structures to be attractively applied to curvy surfaces. As brand owners continue to move toward differentiated container geometries designed to engage consumers, these unique shapes will become more prevalent. Equipment manufacturers are working on ways to combine label properties with the latest in machine technology to accommodate new structural designs at efficient production speeds.

3. Shrink sleeve

Shrink-sleeve labels have been an attractive decorating alternative since the technology began expanding in use following the Tylenol® tampering incidents of the early 1980s. Early usage was for neck band applications which quickly evolved into decorative full body sleeves.

Typically made from polyethylene terephthalate (PET), polystyrene or polyvinylidene chloride (PVdC), shrink sleeves can accommodate a broad range of printing techniques. Many brand owners find their ability to deliver a full 360 degree billboard effect, a desirable marketing attribute.

We have recently seen examples of how shrink sleeve capabilities are being expanded to accommodate additional demands for information. For example, the new FDA requirements for sunscreen products will require more label space than the previous SPF number system. For smaller packages, it becomes impossible to deliver the information on the surface area provided by the container. Other techniques will have to be employed.

A shrink-sleeve application is currently being tested which includes a “seamed in,” accordion, pull out panel similar to that found on PS labels for certain household chemical and pharma products. The converter sends it to the packaging plant already placed on the shrink-sleeve tube, so there is no need for a secondary labeling operation. This capability is also ideal for couponing, promotions and other applications where disseminating additional information is desirable.

Expect to see growth in traditional markets such as beverage, but also in areas such as personal care and household products.

4. In-mold labeling

In-mold labeling (IML) is ideal for higher volume containers when arriving pre-labeled to the filling location is desirable. Technology inroads are being made in both IML materials and equipment.

Materials traditionally used for IML applications are typically polypropylene (PP) based, but polystyrene has also been used. Instead of employing adhesives, some materials utilize a plastic blend that allows the label to be absorbed into the sidewall and become part of the container structure.

Work is being done to create materials that are more pliable. This will enable them to conform to the bottle better, minimizing the chance of “fold over” in applications with radii. These new structures are also expected to handle larger surface areas, allowing the brand owner to deliver additional product and usage information to the consumer.

IML is also ideal for applications which are subjected to refrigeration or other high-humidity environments.

On the equipment side of the IML equation are new robotic capabilities which allow pinpoint precision in label placement within the mold. This is highly desirable with engraved or embossed areas that require IML in perfect registration.

5. Heat transfer

Heat transfer experienced its peak usage in the 1970s and early 1980s. However, as competing technologies such as PS and shrink sleeves started becoming more prevalent, heat transfer experienced a decline. The process continues to be a good consideration for applications which require as many as 10-colors.

In recent years, new structures have been introduced which do not require polyolefin bottles be treated before heat transfer labels can be applied. That has made the technology more conducive to being used in line. Also, unlike other decorating types which require a container be cooled before the label can be applied, elevated bottle temperatures work well with heat transfer. It can often be more cost-effective than IML since heat-transfer labels are less expensive and bottle production rates are not reduced.

We are more likely to see heat transfer used with larger-format bottles when using a PS label becomes more cost prohibitive. Additionally, many heat-transfer label converters have been transitioning from rotogravure to flexography printing further bringing down costs.

6. Hot stamping

Hot stamping is considered the most “brilliant” form of decorating. It is typically found on high-end cosmetics or when an accent is required to give a bottle a more upscale look. Innovations in this area include quicker release foils which don’t require as much heat. Inroads in equipment have also been made, increasing speeds from the traditional 20 bottles per minute to 50 – 55 per minute.

7. Pad printing

Pad printing is ideal for directly decorating products or packages with odd-shaped dimensions. Improvements in this technology include rotary pad printers which are capable of delivering speeds at upwards of 100 per minute.

8. Tube printing

Tubes can be decorated in a variety of ways including six- or seven-color offset, silk screening, flexography and hot stamping. There have also been some very recent applications of IML tube decorating. The fastest decorating speeds are typically found on offset units, with silk screening also pushing traditional speed boundaries of the past decade.

One of the more recent inroads in tube decorating are multistation presses which have the capability of either silk screen or flexo printing on the same piece of equipment by simply changing print heads. (Flexo printing continues to increase its share of the tube market.) These combination presses are better able to control the vignettes that are created, plus create additional “pop” with more vibrant colors.

About Silgan Plastics Decorating Services

If you would like to get more information on how Silgan Plastics can provide decorating assistance, please contact us at (314) 469-4673 or silgan_marketing@silganplastics.com.