The New Generation of Laser Coding

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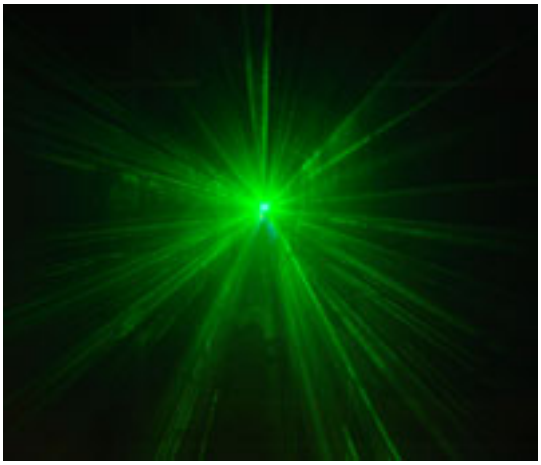

Manufacturers enjoy code permanence and improved productivity

Food and beverage manufacturers are always looking for ways improve productivity and increase the uptime of their machinery. There are many ways to achieve both of these goals, but one area that is often overlooked is variable data coding of packaging. This entails placement of information like expiration dates, manufacture dates, lot codes and other variable data on packages. Such information is a means to protect consumers from harm and help the manufacturer locate affected product lots faster if there is a concern.

There are multiple technologies available to food and beverage manufacturers for package coding, but one method that is quickly growing in prominence is laser coding. The newest generation of laser coding systems offers numerous benefits for product coding applications in the food and beverage industry, such as reduced costs and downtime, but also code permanence and the ability to handle today’s faster line speeds and the demand for more data within a code.

Two common methods

In this image, a Videojet® 3120 10-watt laser coder is removing ink from a 12-pack carton of soft drinks, a process known as ablation.

Industrial laser marking started in the early 1970s and since then has developed into a well-established technology. It can be used for marking numerical codes, 2D-matrix and bar codes, logos and symbols onto a wide range of substrates, including coated paper stocks, glass, plastic and metals. Lasers do not require inks, stamps or ribbons to generate a code. In modern sealed CO2 laser coders, an infrared laser light is generated via radio frequency discharged in a carbon dioxide gas mixture.

The two most common methods of laser coding products in food and beverage applications are ablation and surface modification. In the ablation method, heat from the invisible laser light is focused on the product or package, resulting in removal of a small amount of material from the surface. The most common way laser coders create a mark on food and beverage products is by removing a thin layer of ink from the package. Other examples of ablation include removing the top layer of a foil pouch or etching glass beer or wine bottles.

The second method, surface modification, melts or alters the surface of a product or package in order to create the code. This method is extremely popular for marking PET containers in beverage bottling applications, but is also used for marking tubes, blisters and bottle caps, as well as many other plastic containers.

Improved productivity

The surface modification method of laser coding melts or alters the surface of a product or package in order to create the code. It's extremely

popular for marking PET containers, such as those shown in this photo.

One of the top benefits of laser coding is lower operating cost, due to not using consumables. However, potentially more significant and related benefits – particularly in high-speed beverage and high-volume food applications – are increased uptime and production efficiency. Laser coding does not require line stops for replenishment of consumables, plus there is a less frequent need for cleaning the coder, provided it is properly installed with fume extraction and air filtration. In today's high-volume food and beverage production lines, even small intervals of maintenance can accumulate hours of downtime that can be recovered by switching to modern laser coding equipment.

Another key benefit of laser marking for food and beverage producers is permanence of the codes. A laser-created code becomes an integral part of the package, and is resistant to extremes of temperature, humidity and condensation. Laser-created codes also can survive the processing, transportation and storage requirements for fresh juices, cheeses, meats, frozen foods and fresh vegetables. Traditionally, one of the most difficult coding applications is ice cream containers because of the temperature extremes and occasional condensation during processing and storage. But those products are now easily marked with crisp, clean and durable codes using laser technology.

A concern with traditional coding solutions has been smudging when a container touches another on a production line. But laser coding eliminates that concern for products that are subjected to rubbing during processing or transportation, such as jugs or bottles. Because the package surface itself is altered, laser-created codes provide unequaled wear resistance and can be as durable as the packaging material itself.

High-quality codes

In modern sealed CO_2 laser coders, such as the Videojet 3320 seen in this photo, an infrared laser light is generated via radio frequency discharged in a carbon dioxide gas mixture. The resulting code is permanent.

Another reason laser coding is becoming more popular is because the technology provides high-quality codes. Steered-beam lasers print each number or character in

the same manner as a pen writing on paper, resulting in continuous-line codes. These codes are easier to read by humans and vision systems than those produced by dot-matrix systems. Code heights and widths are easily scaled and retain good legibility, even at very small sizes.

A popular trend today is to expand the code content beyond the basic manufacturing location and date, such as including a consumer message. Previously, the ability to print the amount of content for promotions, game entries and related marketing activities hasn't been possible with the speed capabilities of laser coding systems. This forced food and beverage producers to either slow down the production line or limit the amount of code content placed on the product. With today's laser coders, however, multi-line messages can be coded at high line speeds with no degradation in quality, no reduction of line speeds and no increase in coding costs.

Making the choice

The benefits of laser coding are compelling, particularly improved productivity, increased uptime, faster production line speeds and more permanent codes that withstand temperature and humidity extremes. But ascertaining whether laser coding is a fit for a packaging operation is best determined by supplier representatives who have the experience to assess all factors, including those that aren't readily apparent. They will also ensure the installation process is sound and that the laser coder is operating at peak efficiency.

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