PolyOne

Program Bulletin

Color & Additives

OnCap™ Fast Mark™ Laser Marking Additives

Challenge

Driven by security and product traceability needs, laser marking of plastics is becoming more common as processors work to overcome the limitations of ink printing, hot stamping or other labeling processes. Processors are looking to avoid:

- Slow, inflexible marking systems
- The hazards of handling solvents
- The mess and waste associated with inks
- High scrap rates due to labeled parts that are not legible
- Long drying or curing times
- Nondurable marks that wear off quickly

Solution

Laser marking technology continues to improve, and the latest laser equipment – coupled with the proper laser marking additive – can address the needs of the market today. Laser marking additives are added to polymers that themselves do not strongly absorb the wavelength of the laser light. The additives absorb the light and transform it into heat, which carbonizes or foams the surface of the polymer only in the location where the laser has heated the surface, resulting in a light or dark contrasting mark on the otherwise unaffected plastic part.

A variety of laser marking additives are available, ranging from inorganic fillers such as talc, clay or silica, to more sophisticated solutions such as pearlescent pigments, coated micas and other specialty formulated materials designed to photochemically change color. It is important to know the type of laser, the polymer substrate, and how colorants in the formulation will respond to the laser energy in order to deliver an appropriate laser marking additive.

Several different types of lasers are used to mark plastics, each operating at different wavelengths. Common types include YAG (1,064nm), YVO4 Vanadate (1,064nm), Green Laser (532nm), CO2 Steered Beam or Dot Matrix (10.6um) and a new technology, the YB Fiber Laser (1060nm to 1070nm).

Value

Laser marking additives provide value to both the processor and the OEM. For the processor, fast, noncontact, clear marks can be delivered with no mess. Marks can include alpha numeric, logos or bar codes, all with the same piece of equipment. The results include reduced scrap rates, improved cycle times and lower overall cost of product.

For the OEM, the use of laser marking additives provides an attractive permanent mark that can help increase sales and reduce customer complaints. In addition, risks are reduced as product recalls can be accomplished more accurately and counterfeit goods can be identified and stopped more quickly.

Implementation

OnCap™ Fast Mark™ laser marking additives are available in concentrated powder and pellet form. Typical use rates for the pellet range from 2% to 5%, with typical use rates for the powder ranging from 0.5% to 2%. The additive can be metered at the throat of the machine or blended as a salt and pepper mix with base resin prior to processing. The additive can also be combined with colorants into a single OnColor™ Smartbatch™ concentrate. In most applications, this is preferred because the pigments used can affect the performance and quality of the mark.

Application

Laser marking additives can be used in polyolefins, ABS, polycarbonate, TPU, PET, PBT, Nylon, PVC, Acetal and TPEs, among other resins. Colored laser marks are limited to applications that have a dark colored background, and cannot be achieved in polyolefins, PVC, TPU or TPE. Common laser marking applications can be found in the packaging, electronics/electrical, healthcare, transportation, animal identification and security industries.

PolyOne offers a one-stop source of color concentrates, additive concentrates, color and additive systems, and associated technology and support services. Our expertise extends across a wide variety of industrial and consumer markets. We have more than 20 manufacturing locations in North America, Europe and Asia, with color labs, design centers and sales offices located around the world.

Please contact your nearest sales office for assistance in choosing the right solution for your needs.

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