



PolyOne - Innovative Solutions

**NEW DEVELOPMENTS
MAKE LASERMARKING
THE FAVORED MARKING
TECHNOLOGY**

Manufacturers of wire and cable increasingly are asked to permanently mark their products. A permanent mark helps ease installation, as well as repairs. It also can simplify logistics, an important consideration as the increase in data and voice traffic also has led to an increase in the complexity of cables and the number of cable designs.

Facing these demands, manufacturers can select from several marking technologies such as marking with embossing wheels, ring marking, engraving, offset printing, length stamping, hot foil printing, laser marking and - most commonly - inkjet marking. No matter the method selected, it needs to be reliable, extremely durable, and provide a legible marking over the total cable length.

Laser marking is a well-established technology in the plastics manufacturing industry for marking of components. Due to the ease of changing layouts, and the permanence of the inscription, lasermarking has become a logical choice for printing of plastic parts. The process creates an indelible differentiated marking useful for long-term identification, and has minimal affect on product integrity.

Machinery developments support faster production

So why has the adoption of lasermarking lagged some other marking technologies in the wire and cable industry? The negative impact of the technology on extrusion speed has been the biggest drawback. Also, some manufacturing required a 2-step process for lasermarking, adding a logistics hassle to production.

However, recent developments by leading manufacturers of laser marking equipment enable high speed marking ‘on the fly’ (continuous processing) with fiber laser technology at rates of up to 400m/min. PolyOne collaborates closely with these leading manufacturers and can offer our customers support in identifying appropriate equipment.

Laser marking remains legible even after many years. Unlike other marking processes, It does not require consumables such as hot foil tapes, inks and solvents. The cost associated with maintaining a lasermarking system also is lower than for other printing systems.

Features & Benefits of Lasermarking

Features of lasermarking	Benefits of lasermarking
High quality marking	<ul style="list-style-type: none"> • High resolution and contrast • Products can be designed in smaller sizes
Durability and permanency	<ul style="list-style-type: none"> • No wear off or indelible marking (solvent-, oil- and abrasion-resistant) • Counterfeit-proof
Flexibility, versatility	<ul style="list-style-type: none"> • No design restrictions • Customization & differentiation
No pre/post treatment	<ul style="list-style-type: none"> • Process simplification
Marking speed	<ul style="list-style-type: none"> • High output • Extrusion and marking in one step
Cleanliness (No inks or solvent)	<ul style="list-style-type: none"> • Low maintenance cost (No downtime for cleaning)
Cost effective	<ul style="list-style-type: none"> • Less rework, scrap & inspection

Additive selection critical to success

Depending on the polymer selected for the cable jacket and its color, some lasers will lightly mark the plastic or leave an indentation mark. The inclusion of laser-sensitive additives in the thermoplastic jacketing provides an excellent marking contrast and high-quality line edge detail, even at high extrusion line speeds. During processing, the laser beam activates the laser sensitive additives. The activation changes the molecular structure of the additive, causing a color change that provides the vivid contrast for lasermarking.

Effective lasermarking requires expertise about pigments, any other additives included in a cable compound, as well as the type of resin used for the cable jacket. Threshold concentration limits and color design also must be considered. It is important to emphasize that marking and contrast can be optimized for each color and polymer. No universal solution exists; selection of the appropriate lasermarking additive is critical to achieve excellent marking performance.

Laser formulations should not adversely affect a cable’s appearance, nor its mechanical, physical or functional properties. The additive selected must meet the European Union’s Restriction of Hazardous Substances (RoHS) directive and comply with other regulatory classifications. So although the lasermarking process has improved dramatically, a high level of expertise is still required for successful implementation. The key to success is collaboration with an experienced color and additives supplier to support a manufacturer’s lasermarking process.

In our experience the use of a “smart” concentrate, incorporating the lasermarking additive plus any other required colorants and additives, often rapidly offsets the incremental material additive costs, while also providing unprecedented marking contrast at high output rates. PolyOne’s expertise in specialized polymer materials, colors and additive formulations, coupled with its experience in the cable industry and its close relationships with industry players, gives you the confidence to successfully implement lasermarking in your production facility.

Learn more about PolyOne’s Oncap™ and Smartbatch™ solutions for lasermarking at www.polyone.com, or contact us at info@polyone.com.

