

## **Laser Marking of Plastics: Essential Factors for Successful Implementation**

Laser marking of plastics is an innovative technology that offers a permanent, precise, and efficient alternative to traditional labeling methods. Unlike ink-jet printing, hot-stamping, or adhesive labels, laser marking eliminates the need for consumables while ensuring compatibility with recycling processes and maintaining cost-effectiveness. However, the unique properties of plastics pose challenges particularly due to their limited absorption of the 1064 nm wavelength, which is commonly used in industrial laser marking. Therefore, successful implementation of laser marking of plastics requires an optimal combination of polymer, laser settings, and additives.

This paper will primarily focus on the fundamentals of laser marking, emphasizing the three most important factors required to achieve a successful laser mark: polymer chemistry (aromatic vs. aliphatic), laser settings, and additive chemistry. By understanding these critical elements, practitioners can optimize their laser marking processes to enhance the quality and durability of the marks on plastic substrates.