

## Permanent Marking of Plastic Products and Packaging with Ultraviolet Lasers

### Challenge

Manufacturers of electronic components, pharmaceutical products and packaging, as well as consumer products have a critical need to permanently mark these products, e.g., for tracking, anti-counterfeit, branding, or functional purposes such as graduation marks. Labels can be damaged or removed, inks can contaminate, and infrared lasers will cause charring and other unwanted thermal effects.

### Solution

Ultraviolet lasers are ideal for most of these marking tasks since the high-energy photons from these lasers directly break the molecular bonds in plastic polymers. This can be used to cause a photochemical transformation that changes the color of the plastic, without removing material or causing thermal damage to the surface.

The most common photochemical transformation is to bleach a colored material and leave a bright mark. Some materials are designed to produce other types of color change. For example, ultraviolet lasers can create dark, high contrast marks on ABS and polyurethane that are white due to titanium dioxide doping, as in front panels of kitchen appliances. Ultraviolet lasers can also mark transparent and coated, colored plastics as used in inhalation masks or eyeglass frames. In pharmaceuticals, UV laser marking is also well-suited to marking gel capsules and blister packages, and for creating QR codes on bottle caps.

Coherent is one of the leading suppliers of pulsed ultraviolet lasers for marking and other industrial applications. Decades of experience in ultraviolet applications deliver lasers with the highest reliability and longest lifetime, e.g. the PowerLine E 8 QT.

### Benefit

Ultraviolet laser marking meets the broad need for marking plastic products and packages without creating any HAZ or other thermal damage. Coherent laser markers and systems provide you with proven ultraviolet marking solutions from an experienced vendor.

### Application Field

Marking electronic components, pharmaceutical products and packaging, as well as consumer products.

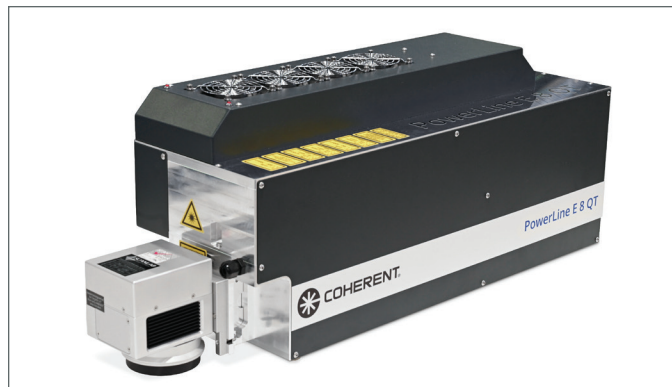


Figure 1. The PowerLine E 8 QT is ideal for cold marking of plastics.

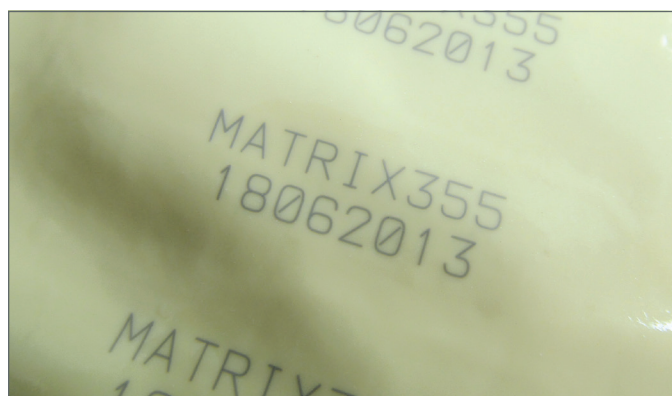


Figure 2. Ultraviolet lasers can mark colorless materials as used in gel packaging.



Figure 3. Ultraviolet laser marking is ideal for QR codes on plastic bottles and packages including HDPE.

### Contact

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