



DataLase Solutions for Laser Marking in Pharmaceutical Applications





Introduction to the Problem

Product marking has come under increased scrutiny in the pharmaceutical industry due to pressure from three factors: regulations, aesthetics, and cost.

The Drug Quality and Security Act, a United States bill passed in 2013, calls for manufacturers to make prescription drugs traceable on a per-unit basis. Manufacturers will need to mark each package with a serial number or machine-readable code in order to comply, a process better known as serialization.

This legislation affects packaging aesthetics and design. Drug makers using laser ablation already mark conspicuous blank regions—“black boxes”—to increase contrast. New serialization requirements call for additional variable information and, as a result, larger marking regions. This is an unwelcome prospect because black boxes often clash with package color schemes and branding.

The bill also threatens to increase cost. All pharmaceutical manufacturers—even those accustomed to marking products already—are at some risk, since marking additional information takes time and threatens to slow production.

That said, cost challenges are greatest when serializing products that were never designed to be marked. For example, laminated packaging poses challenges when marking with inkjet (poor ink adhesion) and ablation (laminar bubbles and melts), forcing manufacturers to add layers to the label or apply coatings to boost ink adhesion. These steps add cost but have become common approaches to staying compliant.

Laser-Reactive Materials are an alternative marking technology that present aesthetic and economic advantages in some cases.



These materials are colorless or white when part of liquid coatings but, when irradiated with a CO2 laser, undergo a chemical reaction and turn dark colors (typically black). CO2 laser systems designed for ablation can also create images on laser-reactive materials, albeit with several key differences between the two methods:

- **Dwell time**—inducing a color change reaction takes less time than ablating a surface
- **Film layers**—additional film layers required for ablation are unnecessary when marking using color change
- **Code security**—color change reactions can take place under protective laminates; ablation cannot
- **Contrast**—laser-reactive materials go on colorless/white and turn black; ablated codes are white and need a dark background to be legible
- **Byproducts**—ablation can produce copious smoke and particulate; color change greatly reduces these byproducts

The following pages show, in greater detail, where laser-reactive materials are impacting the two mainstays of pharmaceutical packaging: labels and folding cartons.

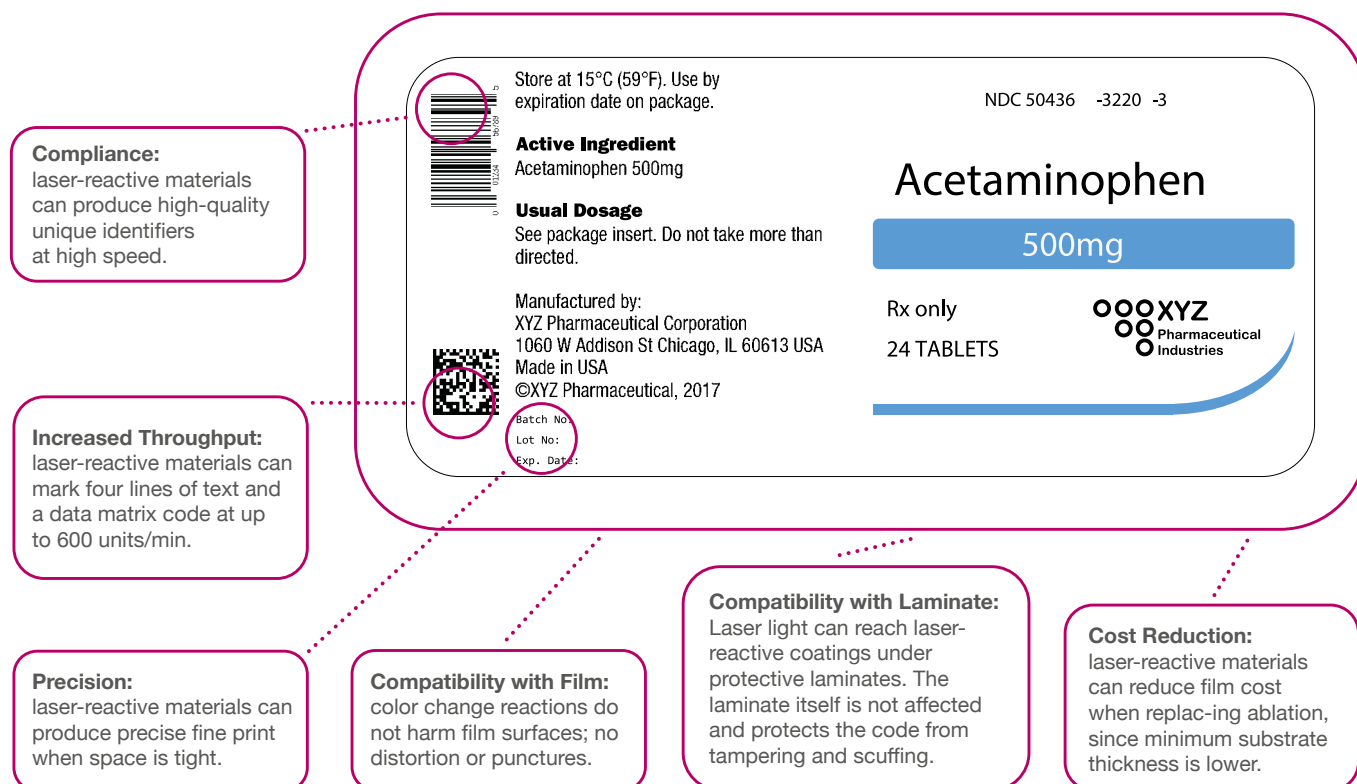
Laser-Reactive Materials and Pharmaceutical Labels

Top manufacturers like Johnson & Johnson and Merck are embracing laser-reactive materials for two reasons: cost and compliance.

Using laser-reactive coatings and CO2 laser marking systems, manufacturers can mark thinner films at faster speeds than other methods.

Laser-reactive materials can image while under laminates—manufacturers can use simpler, thinner film constructions and increase the number of labels per roll. Precise printing with these materials eliminates rework.

Laser-reactive materials can produce unique identifiers, such as data matrix codes, in accordance with Drug Quality and Security Act rules.



Laser-reactive materials can further upgrade coding lines and package design.

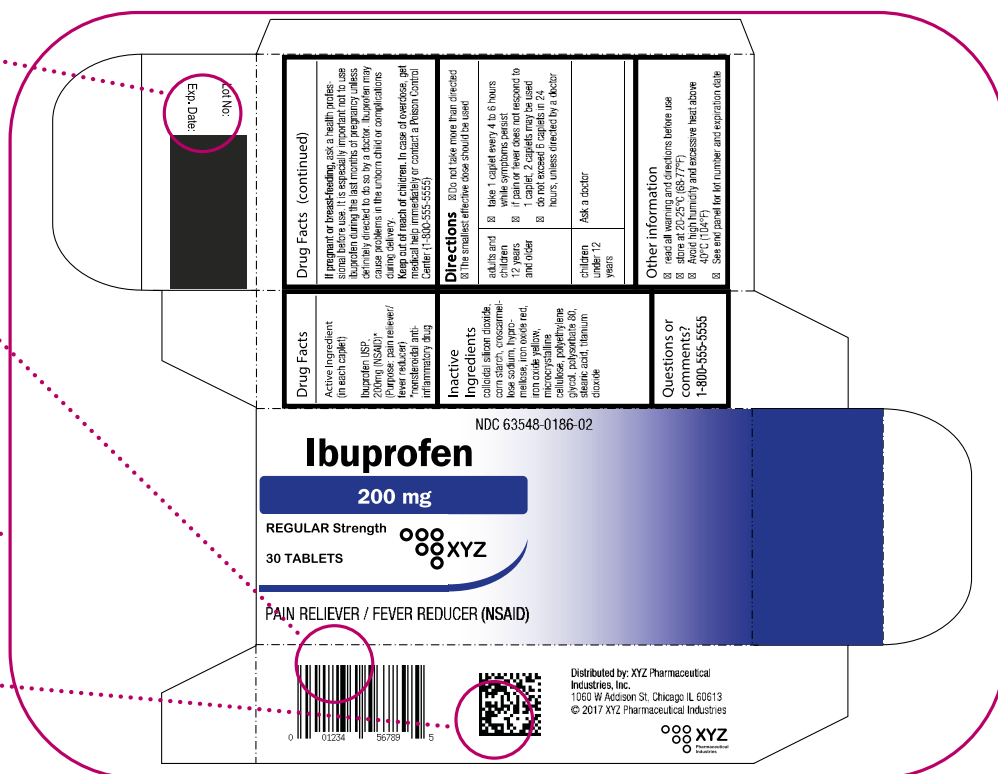
These materials create marks faster and darker than ablation and don't need a "black box" for contrast. The marking process does not generate particulate matter, reducing the risk of contamination.

Laser-reactive materials also provide tangible return on investment, since marking takes place at lower power. Operating the laser at reduced power output can increase its life.

Compliance:
laser-reactive materials
can produce high-quality
unique identifiers at
high speed.

Safe and Clean:
The marking process produces no particulate matter, reducing risk of contamination.

Increased Speed:
Laser-reactive materials produce darker codes at faster speeds than ablation.





For more about in-line digital print solutions,
please visit Datalase at www.datalase.com



Unit 3, Wheldon Road, Widnes, Cheshire, WA8 8FW, UK

 +44 (0) 151 423 9360  info@datalase.com