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# Strategic Partnership Yields Innovative Laser Marking

## Laser Marking Technologies and Uniform Color Create Effective Firearms Marking Solution

**Description:** This whitepaper details how Laser Marking Technologies and Uniform Color created effective laser marking for American Speedloaders products.

**Company information:** Laser Marking Technologies, LLC (LMT), founded in 2002 and based in Michigan, is an international leader in laser marking and engraving innovations, providing state-of-the-art, cost-effective solutions and serving a wide range of industries.

LMT teamed up with Uniform Color Company (UCC), a leading manufacturer of custom color and additive masterbatch solids for the thermoplastics industry, to solve a problem for firearms producer American Speedloaders (ASL). The nylon 6 material ASL uses to manufacture speedloaders could not be effectively marked with serial numbers for traceability, as certain lasers would cut through the material while other laser types did not provide a contrast mark with the black background.

LMT enlisted expertise from UCC to make the material laser-friendly with a masterbatch additive that enables LMT's laser markings to show up as white. The result was a cost-effective, permanent mark that increased parts traceability by 40 percent, decreased cycle time by 150 percent and provided an unexpected savings in ensuring units coming back for warranty work were not counterfeit.

There are two main laser marking methods that are used on plastics. Carbonization, which is also used on metal, chemically bonds with the carbon molecules in the material to create a dark-colored mark, typically black. It effectively chars the material to mark it. Foaming, on the other hand, works by heating the material to create oxidized gas bubbles, which results in a raised mark. The foaming process is effective for plastics, but often doesn't create enough of a contrasting mark, which is where UCC comes in.

The company's proprietary masterbatch additive makes the laser mark appear white so that it will show up on dark-colored plastics like ASL's products. This masterbatch technology can also create a dark mark on medium- to light-colored plastic. UCC used its additive with LMT's Cobalt Dominator, a 1064nm wavelength 20w Ytterbium Fiber laser, to ablate parts numbers on ASL's speedloaders.

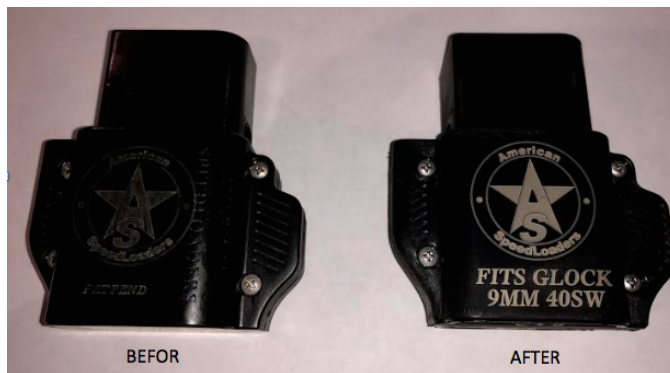


There are alternatives to laser marking in the plastics industry, but they are typically more costly and less permanent. Marks, including serial numbers, logos and pictures, can be ink printed onto plastic. This type of marking does allow for the widest array of colors. However, the marks are less durable and less cost-effective to produce, as there are ink costs, and it takes longer to create the marks this way than it would to laser mark them. It's also a less flexible process, as ink markings can't be changed as easily in the manufacturing process.

Many manufacturers place printed adhesives on their plastics. This process is more time-consuming, less durable, less cost-effective with the cost of the adhesives themselves and of printing them, and less flexible, as once they're printed, they can't be altered. The process also yields more waste. Again, the only advantage here is a wider array of colors for the markings.

In the case of ASL, adhesives would never have worked, as they can be removed and therefore aren't effective for traceability and proof of authenticity. Ink may have worked, but would be more costly and easier to remove from the plastic surface.

Using LMT's Dominator desktop three-axis programmable laser combined with UCC's proprietary masterbatch plastics additive, American Speedloaders was able to create a visible, durable serial number on its speedloaders. The number is permanent on the first layer of the nylon 6 material. The company's investment cost was the LMT laser — a good investment, as it also marks steel and other manufacturing products — plus UCC's service cost, where other processes would require repeated consumables purchases (ink, adhesives).





The laser marking process is extremely precise, fast and flexible. Manufacturers can change the markings "on the fly" with the easy-to-use programming system built into the Dominator, so there's no extra cost for changing marks. Standard mirror speed can be up to 250 inches per second, with repeatability deviation of less than 2 percent. What's more, LMT and UCC ultimately saved ASL money in making parts more traceable and eliminating counterfeiting on warranty work.

The process employed by LMT and UCC for ASL has widespread manufacturing applications, including consumer and automotive products, appliances, and product barcodes, QR codes and serial numbers. The laser markings can be made on nylon, as in the case of ASL, as well as other thermoplastic polymers like acrylonitrile butadiene styrene (ABS), polycarbonates (PC) and polypropylene (PP). The high-precision marks are permanent, made at a high speed and easily adaptable for multiple products.

Laser Marking Technologies, LLC. ([www.lasermarktech.com](http://www.lasermarktech.com)), founded in 2002, has become a leader in laser marking and engraving technology. LMT maintains a relentless drive to provide state-of-the-art, cost-effective solutions to the laser marking industry. Despite using the most advanced technology, LMT offers the most competitive prices, and all products are manufactured in the United States at LMT's Michigan plant.

Uniform Color ([www.uniformcolor.com](http://www.uniformcolor.com)), an Audia® company founded in 1981, is a global manufacturer of high-quality custom color and additive masterbatch solids for the thermoplastics industry. UCC's deep expertise in the market and personal collaboration with customers give the company a unique edge. UCC is known for its tech service and formulation expertise, but best known for its work in polyolefins and styrenics for automotive, furniture, packaging and industrial markets.

American SpeedLoaders, LLC. ([www.americanspeedloaders.com](http://www.americanspeedloaders.com)), based in Michigan, designs products for easy use and effectiveness. ASL carries a vast assortment of speedloaders to fit multiple applications.