

Die-Cutting and Adhesives Help Revolutionize Ammunition for Sport Shooters



Glow Ammo applies innovative fabricating and adhesive technology to a recreational shooting application.

Hallam, Inc. provides revolutionary cold tracer technology that allows sport shooters to improve their marksmanship on the fly and have more fun doing it. Working with Fabrico, Hallam introduced its new Trajectory Identification Technology in an easy to apply format that appeals to recreational shooters.

Called Glow Ammo, Hallam's new technology brings the benefits of tracer technology to the world of reloaders (shooters who load their own shot) without the drawbacks of typical incendiary tracers. There's no fire or flame and the shooter can see the impact of every round immediately.

With Glow Ammo, ballistic trajectories are apparent in no- or low-light situations (indoors on a range at any time; outdoors from dusk until dawn) as soon as the trigger is pulled. The light signature is only visible from the shooter's perspective – the trace, does not give the shooter's position away.

Real-Time Feedback on the Shooting Range

In most shooting applications, feedback comes in the form of seeing where you hit your target after the shooting is over. Hallam created Glow Ammo's Trajectory Identification Technology to bring instantaneous real-time feedback to the shooting range.

With Hallam's Trajectory Identification Technology, feedback is truly immediate. A shooter can make adjustments on-the-fly in real-time. The cold-tracer technology brings a new dimension of control, allowing the shooter to safely expose faults, such as trigger jerks, and correct them immediately. A shooter becomes more capable, using the feedback from the last shot to adjust the next shot.

**Bonding, Joining
& Sealing**



With Glow Ammo, a shooter becomes more accurate using feedback from the previous shot to make adjustments.

Easy Application as Part of the Reloading Process

The design of the product is geared to make application easy for reloaders. As a reloader prepares his or her shot, the Glow Ammo dot is quickly and easily applied as part of the process. The dot is peeled from the liner, positioned on the end of the shot, and pressed into place. The Glow Ammo dot can be applied to 9mm, 40 caliber, and 45 caliber handgun ammunition. The product has no measurable effect on accuracy or velocity. The weight is less than a grain and the product has been measured using chronograph testing.

Making the product easy to apply was a key consideration during development. Hallam worked on the technology for more than three years to be sure that it would operate safely and effectively on both indoor and outdoor ranges.

Working with an Experienced Converter

Fabrico and Hallam worked closely to combine the appropriate materials and adhesive for the Glow Ammo product. What originally looked like a relatively simple lamination project evolved into a more complex challenge involving in-depth adhesive investigation and testing.

Fabrico investigated various adhesive formulations to discover how to keep the glow dot attached to the bullet.

Using a low density plastic substrate, Fabrico investigated adhesives that would stick this material to the bottom end of a lead bullet before it was placed into a copper shell casing. Fabrico experimented with various adhesive formulations before arriving at a solution that would keep the dot affixed to its packaging, allow the shooter to peel the liner from the dot, then adhere firmly to the bullet throughout its trajectory.

In addition to selecting the adhesive, Fabrico also developed an optimum liner for the adhesive so that the process of removing scrap material during production wouldn't slow down the production process. Fabrico matched the material, adhesive, and manufacturing process to fit Hallam's design.

Fabrico assisted Hallam with packaging. The packaging made the "peel, position, press" application of the product easy and self-evident to the user.

The packaging helps to make the product attractive to the reloading audience by keeping the use of the product simple and straight forward. Glow Ammo is available at stores like Cabela's, and is receiving rave reviews from users. In addition to recreational/target shooters, the product has applications in hunting, police work, and security.



Using a low density plastic, Fabrico selected an adhesive that would stick the Glow Ammo dot to the bullet.

In-depth Adhesives and Materials Testing

With a fully equipped test laboratory, Fabrico ensures that customer materials meet designed in specifications before they move to the factory floor, often eliminating the need to test materials at the customer's facility. Testing capabilities include:

- Accurate and precise part dimension measurement and verification;
- Adhesive/release liner testing to determine converting properties and high speed application characteristics;
- Material strength measurements to ensure that materials meet application requirements;
- Static shear testing to measure the cohesive strength of the adhesive to withstand a fixed load over time;
- Material weight measures adhesive coat weight for an application;
- Microscopic imaging to determine differences between adhesive and materials over time;
- Dielectric testing to determines a material's electrical insulation properties;
- Resistance and voltage testing to provide a complete profile of the electrical properties of an adhesive.

Fabrico also helped Hallam implement packaging that makes Glow Ammo easy to use.

All test and measurement equipment is calibrated annually per ISO 17025 standards. Tests are performed to ASTM (American Society for Testing and Materials) International standards. ASTM International standards are tools for customer satisfaction for a wide range of markets including materials and adhesives testing. Typical ASTM tests performed in Fabrico's laboratory include:

- Adhesion Test Methods - 90 degree and 180 degree
 - ASTM D 3330
 - ASTM D 6265
 - PSTC tests
- Tensile Test ASTM D 828
- Dielectric Tests ASTM D 149 and 150
- Coat Weight Test ASTM F2217
- Resistance, capacitance, and voltage measurements

Fabrico helped Hallam to select the best combination of materials and adhesives for its Glow Ammo application. Only by repeatedly combining different adhesives and materials and subjecting them to thorough testing was Fabrico able to solve Hallam's application challenges.



Fabrico provides die-cutting, slitting, laminating, and kitting capabilities.

About Fabrico

Fabrico's materials converting capabilities include: custom design solutions for applications that require slitting, laminating, and die-cutting. Laser die-cutting, kiss-cut and water jet die-cutting are available depending on the application and materials being used.

With more than 30 years of materials experience, Fabrico engineers also understand the impact of material selection on the overall manufacturing process, and design material systems that optimize production efficiency and improve overall cost-effectiveness.

Fabrico works with its customers to optimize production and improve cost-effective manufacturing.

Material Partners

Fabrico has strategic relationships with world-class materials suppliers, such as 3M, Loctite, Adhesives Research, DuPont, and others to assist its customers in selecting the best material for the intended use and to expedite materials sourcing. Whether adhesive films or liquid, all critical material properties are considered in any Fabrico project, including chemical, thermal, and moisture resistance.

