



T-Link™ film expands design and manufacturing processability.

An L&L customer that specializes in composite armor produces military-grade ballistic helmets. They needed a solution to help reduce the weight of the helmets without compromising performance.

CHALLENGE

To protect users against the extremes that come with combat and to lighten the load in protective armor for agility, a helmet manufacturer was tasked with the challenge to find a solution that enhances the rigidity and toughness in the latest military-grade helmet designs. They chose to move away from heavier para-aramids to a lighter weight polyethylene (UD UHMW-PE), however while the switch reduced the weight of the helmets, it also caused the deep drawn shells to be too flexible and lack structural integrity. The manufacturer needed a solution that enhanced their users' protection without compromising the helmet's rigidity and toughness.

SOLUTION

The client worked with L&L Products to implement the interleaving of T-Link™ film with single or multiple ply counts of carbon fiber or other reinforcement types within the UD UHMW-PE deep drawn helmet shell to ultimately bond substrates and provide the structural stiffness that was lacking.

RESULTS

The client successfully reduced the helmet's weight by 10% and increased structural rigidity by 20%. By co-molding T-Link™ film with a reinforcement and the uni-directional UHMW-PE, the helmets met all structural and ballistic requirements to pass testing. The manufacturer delivered this solution using the current plant presses, which eliminated the need for additional capital investment.

RELATED MATERIALS

In addition to T-Link™ film, other newly developed products that can apply to similar applications include T-Link™ coated fiber, uni-directional para-aramid, and multifilament reinforcements.

lproducts.com



Client

Helmet Manufacturer

Industry

Military and Law Enforcement Armor

L&L Technology

T-Link film

Key Technical Data

Product	T-Link film
Yield Stress	58 MPa
Break Stress	47.6 MPa
Break Elongation	up to 40%
Short cycle times needed for bonding	
Unlike most epoxy adhesive films, it can be stored at room temperature	

APPLICATION AREAS

- Helmets
- Plates
- Vehicle
- Shields

RELATED MATERIALS

In addition to film, other newly developed products that can also be used for these applications include our coated fiber, UD para – aramid and multifilament reinforcements.



CONTACTS

Jason Walker

Senior Product Development Engineer

jason.walker@llproducts.com

+00 1 586-531-0585