

ADVANCED DEFENSE MATERIALS:

T-Link® Thermoplastic Adhesive and
CCubed™ Cushioning



TROOPER

INTRODUCTION

In the evolving and robust world of defense and outdoor industries, innovation is essential. At L&L Products, we are at the forefront of technological advancements leveraging materials science and advanced engineering to drive progress in the industry.

Through our unique and proprietary T-Link® and CCubed™ technologies, L&L is transforming the way you design products, significantly enhancing performance, comfort, and efficiency.

In the following sections, we will delve into the remarkable features and benefits of T-Link® and CCubed™, showcasing their applications in various industries. Through detailed case studies we will demonstrate how these technologies are reshaping the landscape of the defense and outdoor sectors.



The logo features the word "T-link" in a bold, sans-serif font. The "T" is a solid red color, while "link" is in a lighter red. A small registered trademark symbol (®) is located at the top right of the "K".

T-link®

Engineered by L&L Products

ADVANCED ENGINEERING

THERMOPLASTIC ADHESIVE

TROOPER



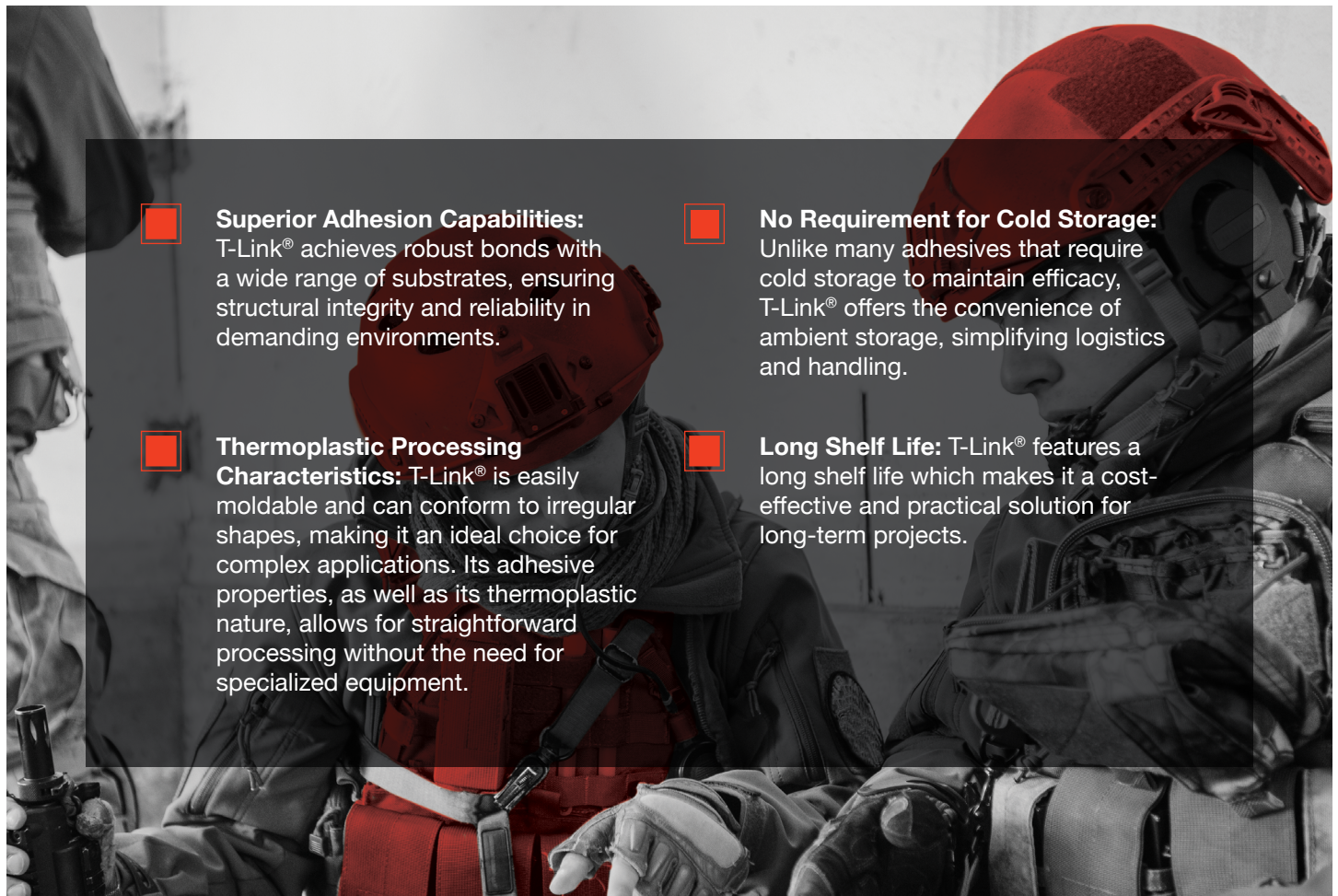
ADVANCED ENGINEERING THERMOPLASTIC ADHESIVE

T-Link® is an advanced engineering thermoplastic adhesive that sets new standards in adhesion capabilities, processing convenience, and durability. It offers superior adhesion to a wide range of substrates, ensuring structural integrity in the most challenging environments.

With thermoplastic processing characteristics and no requirement for cold storage, T-Link® provides unparalleled flexibility and ease of use. Its long shelf life eliminates the need for special handling, making it an ideal choice for long-term projects.

T-Link® is versatile and can be utilized across various industries, including automotive, aerospace, sporting goods, and defense. One notable application is in the production of military-grade ballistic helmets, where T-Link® has demonstrated its exceptional capabilities.

THE T-LINK® DIFFERENCE



- Superior Adhesion Capabilities:** T-Link® achieves robust bonds with a wide range of substrates, ensuring structural integrity and reliability in demanding environments.
- No Requirement for Cold Storage:** Unlike many adhesives that require cold storage to maintain efficacy, T-Link® offers the convenience of ambient storage, simplifying logistics and handling.
- Thermoplastic Processing Characteristics:** T-Link® is easily moldable and can conform to irregular shapes, making it an ideal choice for complex applications. Its adhesive properties, as well as its thermoplastic nature, allows for straightforward processing without the need for specialized equipment.
- Long Shelf Life:** T-Link® features a long shelf life which makes it a cost-effective and practical solution for long-term projects.

CUSTOMER SUCCESS STORY

LIGHTWEIGHT WITH HIGH PERFORMANCE

THE CHALLENGE

Following a request from the Department of Defense to reduce the weight of military helmets, without compromising performance, the customer chose to move away from heavier para-aramids as a ballistic material to a lighter weight UD UHMW-PE.

This material switch made sense from a weight and ballistic performance perspective but caused the deep drawn shell to be too flexible and lack structural rigidity.



OUR CUSTOMIZED SOLUTION: THE LIGHTWEIGHT, HEAVY-DUTY MILITARY HELMET

ACHIEVING BETTER STRUCTURAL RIGIDITY WITH T-LINK® FILM

To enhance the structural rigidity of the military helmet, we have applied an interleaving of T-Link® Film with single or multiple-ply counts of carbon fiber or other reinforcement types within the deep-drawn helmet shell.

REDUCE WEIGHT

Successfully reduced weight and increased structural rigidity **without compromising performance.**

CO-MOLD WITH DISSIMILAR MATERIALS

Co-molded very well to the reinforcement and UD UHMW-PE to provide the rigidity needed **to meet the structural and ballistic requirements.**

COST EFFICIENCY

Worked well with existing plant presses and **required no capital expense** or further delays in meeting goals and new contract requirements.



CCubed™

Clean
Comfortable
Cushioning

Engineered by L&L Products

**High Performance,
Fiber-Based
Cushioning Solutions.**



High-Performance Fiber-Based Cushioning

Ideal for backpacks, armor, and pads, CCubed™ is our innovative cushioning material that outperforms traditional polyurethane foam in moisture management and breathability while maintaining resiliency.

The breathable 3D structure provides cushioning, allows heat to escape, wicks sweat away from the skin, and creates an evaporative cooling effect. This material elevates overall wearer comfort while maintaining cushioning performance.

CCubed™ is versatile and can be used in a wide range of industries, including defense, outdoor, and sports. It is particularly effective in applications where comfort and durability are paramount.

Revolutionizing Performance and Comfort

»» **Industry Leading Breathability:** CCubed™ performs 2x-5x better than current PU foams.

»» **Resilient and Hand Washable:** CCubed™ maintains its resilient structure that can withstand cyclic compression.

»» **Sweat Management:** CCubed™'s breathable 3D structure ensures excellent moisture management, wicking sweat away from the skin and creating an evaporative cooling effect.

»» **Eco-friendly:** Made from PET-based materials, CCubed™ is recyclable, providing a sustainable choice without compromising performance.

»» **Wear Moldable:** CCubed™ is flexible in design and can be easily molded to fit various applications, offering versatility and customization.

Customer Success Story

Challenge

NEMO Equipment, a world-class outdoor gear manufacturer, aimed to develop a 100% PET backpack.

This included taking responsibility for the entire life cycle of the product from repair through recycling at end of use.

Solution

NEMO teamed up with L&L Products to integrate CCubed™ in place of traditional unrecyclable foams used for cushioning in the back panel, shoulder straps, and waist belt.

In accordance with NEMO Equipment's Endless Promise® guarantee for full circularity, CCubed™ contains recycled PET fibers which can be recycled at the end of the application life.



Unlike foams which tend to trap body heat and pool sweat next to skin, CCubed™ optimizes wearer comfort with a high degree of breathability and best in class sweat management.

NEMO body mapped CCubed™ to sweat zones located on the back and shoulders, resulting in a noticeably drier and cooler pack experience.