



LIQUID
ARMORTM
BY HARD SHELL

HARD SHELL introduces LIQUID ARMOR™, our innovative new ultra high-strength, lightweight spray polymer, designed specifically for blast mitigation and fragment/spall containment.

LIQUID ARMOR™ was developed using advanced nano technology and our unique patent pending process for manufacturing our next generation of advanced polymer coatings.

LIQUID ARMOR™ is a **lightweight** alternative to traditional building and vehicle armoring systems, unmatched in weight to protection ratio.

LIQUID ARMOR™ provides significant blast and ballistic protection due to its **superb** tensile strength, tear strength and flexibility.

LIQUID ARMOR™ coated **exterior** surfaces **absorb impacts** from blast events and minimizes collateral damage from structural failures.

LIQUID ARMOR™ coated **interior surfaces** **prevent penetration** from high velocity spalling and fragmentation.

LIQUID ARMOR™ coatings can **mitigate IED blasts**, and prevent damage and injuries from fragmentation in high risk locations such as culverts or trash containers.

LIQUID ARMOR™ has superior bonding characteristics for excellent **protection** from **corrosion** and cathodic disbondment on steel and alloy substrates.

LIQUID ARMOR™ has high elasticity and high surface hardness which results in exceptional **resistance** against **abrasion** or exposure to harsh environments.

LIQUID ARMOR™ adheres to organic and inorganic substrates and dries/cures **rapidly**. It can be easily **applied**, at complex angles and conforms to any shape for rapid protection of assets in high-risk locations.

“LIQUID ARMOR™ is revolutionizing the up-armoring process for vehicles and critical infrastructure.”

LIQUID ARMOR™ Mechanical Properties

Property	Values
Tensile Strength	5940psi(40.95486mpa)
Elongation	480%
Tear Resistance	690PLI (91 KN/m)/-50
Service Temperature	40° - +200 F° (-45° -+93 °C)
Hardness	98+/-2
Volatile organic compounds	0
Viscosity@ 77°F	A:1400+/-100cps B:230+/-25cps
100% Modulus	1,800psi (12mpa)+/-5%
200% Modulus	3,000psi (21 mpa)+/-5%
300% Modulus	4,700psi(32mpa)+/-5%

LIQUID ARMOR - Next Generation Protection



MARINE

LIQUID ARMOR™ ensures blast and ballistic protection of vessel, munitions magazines, and storage. It is neutrally buoyant and is significantly lighter weight than traditional methods of blast protection. LIQUID ARMOR™ provides non-skid surfaces for all working areas while also providing excellent protection against corrosion and abrasion with its self-healing properties. LIQUID ARMOR™ is an ideal solution for creating safe rooms for crew travelling in high risk regions.



ARMORED TRANSPORT VEHICLES

The unparalleled weight to protection ratio of LIQUID ARMOR™ allows for a reduction in vehicle weight while maintaining or increasing blast and ballistic capabilities. LIQUID ARMOR™ provides for improved vehicle mobility and durability, with enhanced protection for personnel; a true alternative to traditional up-armoring systems.

APPLICATIONS

When Protection Demands More



BUILDINGS AND CRITICAL INFRASTRUCTURE

LIQUID ARMOR™ reinforcement of the primary ring of protection, enhances the stand off distance of possible threats to government buildings, embassies, military bases, barracks, bunkers, armories, and checkpoints. During a blast event, LIQUID ARMOR™ coated exterior walls and surfaces absorb blast impacts to reinforce and maintain structural integrity and prevent collapse. LIQUID ARMOR™ coated interior surfaces prevent spalling and fragmentation penetration, which is a leading cause of casualties. LIQUID ARMOR™ can be used to create "Safe" or "Panic" rooms to protect personnel during a terrorist threat or natural disaster.



PUBLIC AREAS

High risk public locations such as culverts or trash cans can be used for planting IEDs. LIQUID ARMOR™ coatings can mitigate blasts, and prevent many fragmentation related injuries.

APPLICATIONS



“Cutting
Edge
Technology”

IMPLEMENTATION

LIQUID ARMOR™ is easy to introduce into any stage of construction, from new structures to full retrofits of existing structures.

LIQUID ARMOR™ can be camouflaged to a building's exterior in order to disguise the level of fortification.

The thickness and color of LIQUID ARMOR™ coatings can be customized based on threat level, and requirements of each project.

LIQUID ARMOR™ can be painted to match existing structures.

PROFESSIONAL SERVICES

At Hard Shell, we take time to understand our customer's needs, challenges and constraints along with the specific requirements of each project. Our engineering and project management teams collaborate to design innovative solutions which leverage our global manufacturing capabilities and ability to deliver our solutions across EMEA, ASIA and the Americas. Our many years of industry experience and sensitivity to regional and cultural protocols are crucial to our success.

We strive to provide our customers with the highest level of service. Our team works hand-in-hand with our customers through every step of the project, planning & logistics, implementation and validation. Our highly professional support teams remain readily available to provide ongoing maintenance and answers to questions.

At Hard Shell, we aim to exceed our customer's expectations.

RESEARCH AND DEVELOPMENT

Hard Shell was founded with the goal of saving the lives of those who protect us. We are committed to investing in ongoing research and development of new methods and next generation materials in order to increase the performance of our protection solutions.

Hard Shell's diverse research teams includes scientists, engineers and experienced ex-defense personnel who engage in the design and extensive testing of our protection solutions. You can count on our unwavering commitment to quality across a broad range of high performance protection solutions and services, for the defense & security of personnel & property.

ABOUT HARD SHELL

Hard Shell is a vertically integrated global defense equipment manufacturer, with design and development in the UK and state-of-the-art manufacturing and testing facilities in the USA, UAE, Turkey and Asia.

Hard Shell weaves ballistic fabrics and other aramids, nylons and poly-cottons. In-house manufacturing produces state-of-the-art hard armor composite rifle plates, structural panels and advanced ceramic armor components.

Hard Shell is a complete solutions provider with a product line that includes Personal Body Armor (Vests and Helmets), Hard Armor Plates, Bomb Blankets, De-Mining Suits and Armored Vehicles. Hard Shell carries NIJ 0101.06 Certified Products. (https://www.justnet.org/other/ballistic_cpl.html)

Hard Shell is a trusted and reliable supplier of defense protective equipment for armed forces and police around the world, supported by an experienced staff of former defense industry and law enforcement professionals.

**HARD SHELL - PROTECTING THOSE WHO PROTECT US,
WITHOUT COMPROMISE**

CORPORATE AND ENVIRONMENTAL RESPONSIBILITY

"VOC's" (Volatile Organic Compounds) have been deemed harmful to people, wildlife, and our environment. We at Hard Shell are dedicated to use VOC-Free components in the formulations of all of our products.

"100% Solids" indicate that our products do not rely on any type of solvent or filler as the catalyst to create our coatings.





HARD SHELL

Find out how we can exceed your expectations

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