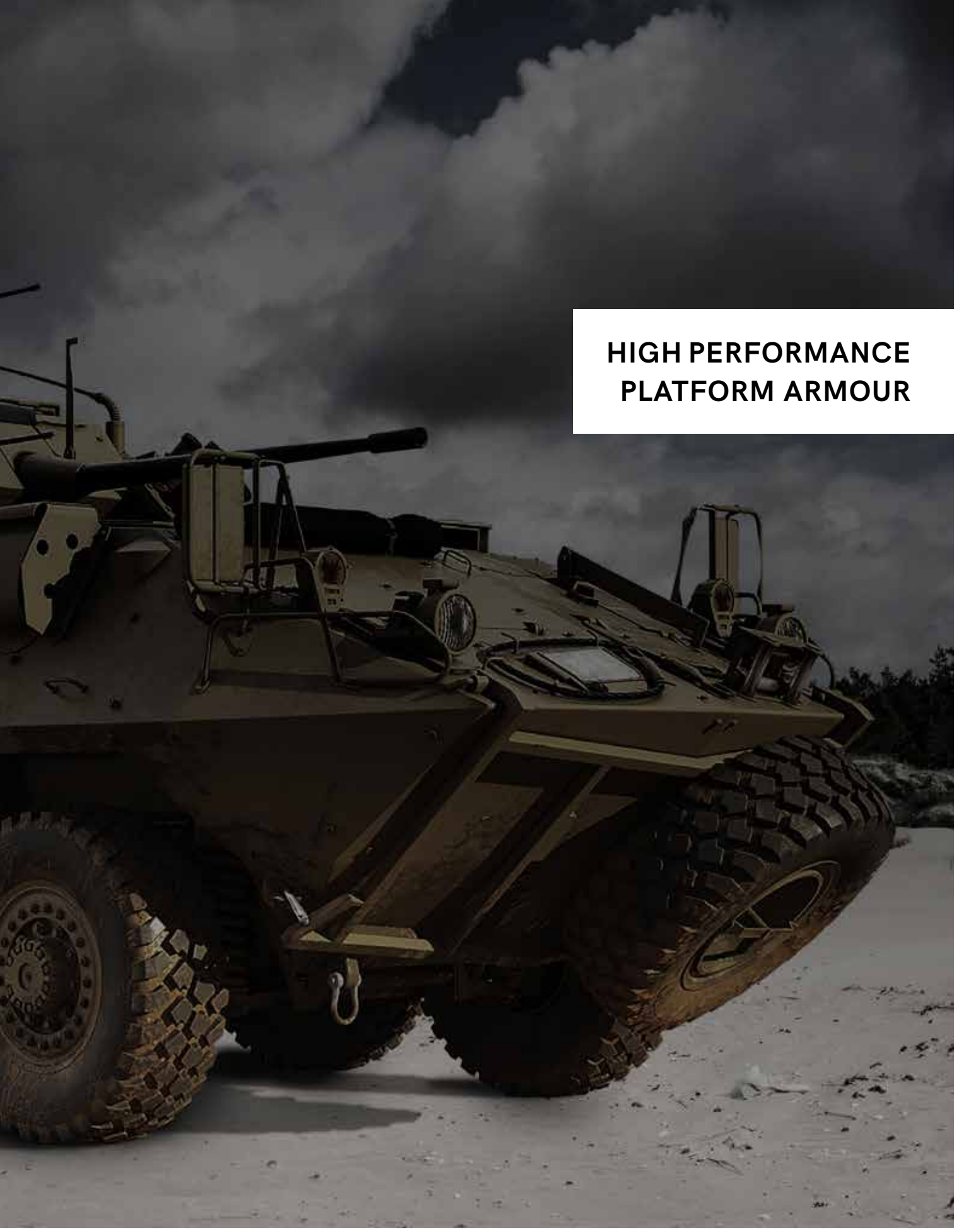


HIGH PERFORMANCE PLATFORM ARMOUR

NP Aerospace

npaerospace.com

Advanced Composite Platform Armour
Half the Weight of Steel Alternatives

NP Aerospace combines core competencies in materials technology, manufacturing processes and integration to deliver world-leading CAMAC composite armour systems for land systems and marine platforms.

Engineered using a unique combination of advanced ceramic and structural composite materials, our high performance multi-hit CAMAC armour weighs up to 50% less than equivalent steel products.

Our armour systems are tailored to the requirements of the threat, the individual platform and its operational duties. Our capabilities include:

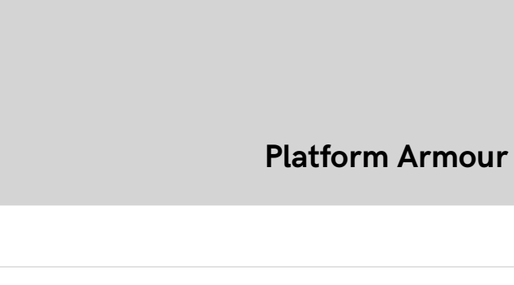
- **CAMAC Spall liners for enhanced crew protection**
- **CAMAC Appliqué armour systems for vehicle and other platforms**
- **CAMAC Ultra-light semi-structural armour systems for protected weapon stations and other applications**
- **CAMAC Composite survivability pods for light patrol vehicles**

Combat Proven Global Delivery

Full armour packages for a variety of armoured vehicles working with OEMs including add on armour and spall liners.

Spall liner and full armour integration for the Mastiff family of vehicles, including Mastiff, Ridgback, Wolfhound and Buffalo.

An integrated survivability capsule for TATA Motors, saving over 1 tonne of weight against steel alternatives.



Shaped spall liner and appliqué armour for the FFG Wiesel 1 platform upgrade.

Lightweight collapsible protected weapons stations for Navistar.

Covert vehicle armour for a variety of base platforms.

CAMAC Appliqué Armour

CAMAC Appliqué armour provides lightweight, multi-hit protection for new and existing platforms against a wide range of threats including small or medium calibre weapons, improvised explosive devices (IEDs) or rocket propelled grenades (RPGs).

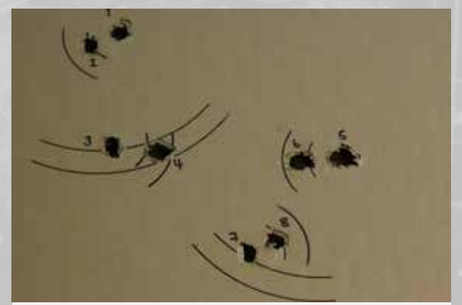
NP Aerospace produces CAMAC Appliqué armour solutions for STANAG 4569 threat levels 2-5. For protection against high level threats, CAMAC Appliqué Armour can deliver the same performance as steel solutions at up to 50% lower weight.

KEY BENEFITS

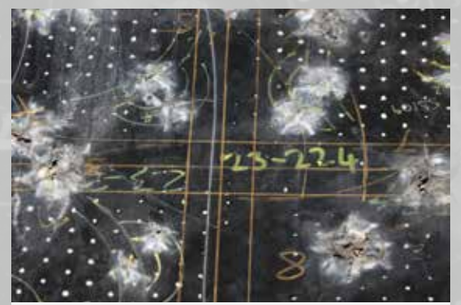
- Applicable for new platforms and upgrades for land, sea and air
- Lightweight multi-hit protection
- Solutions for STANAG 4569 Levels 2-6
- Up to 50% lighter than equivalent steel solution

COMBAT PROVEN

CAMAC armour is extensively tested at the NP Aerospace Ballistics Centre of Excellence to deliver outstanding multi-hit performance.



Testing at STANAG 4569 **Level 2**



Testing at STANAG 4569 **Level 4**

CAMAC Semi-Structural Armour

CAMAC ultra-light semi-structural armour provides effective multi-hit protection for vehicle-mounted weapon stations and specific aviation and maritime applications.

Its lightweight construction reduces additional platform weight, adverse centre of gravity effects and electromagnetic compatibility issues.

NP Aerospace offers customisable weapons station designs to meet specific customer requirements, options, include transparent armour, overhead protection and collapsible shields

COLLAPSIBLE WEAPONS STATIONS

Utilising ultra-light CAMAC armour, weapons stations can be designed to be fully collapsible for discreet applications. The low density of the panels allows the system to be fully reassembled into its operating position by a two person team within 90 seconds.

KEY BENEFITS

- High multi-hit performance at extreme low weight
- Increased vehicle stability and manoeuvrability through lower centre of gravity
- Improved air transportability
- Reduced rotational inertia

CAMAC Composite Survivability Capsules

CAMAC Survivability Capsules, developed from unique composite materials and resin formulations provide a key weight reduction enabler for armoured vehicles, weighing up to 50% lighter than the equivalent steel solution.

Further to reduced weight, CAMAC Composite Survivability Capsules offer improved protection against behind armour effects through inherent spall protection and offers a field repairable solution.

CAMAC Composite Survivability Capsules are custom built to integrate with unique platform requirements and have been used to reduce weight and improve crew survivability across a number of platforms.

PROVEN CAPABILITY: TATA LIGHT ARMOURED MULTI-PURPOSE VEHICLE (LAMV)

NP Aerospace's CAMAC Composite Survivability Capsule technology has been integrated into the TATA LAMV as a key weight reduction enabler.

KEY BENEFITS

- Key weight reduction enabler, up to 50% lighter than equivalent steel solution
- Custom designed to integrate with unique platform requirements
- Field Upgradable Armour via modular CAMAC appliqué packages to provide the maximum protection against evolving threats
- Field repairable
- Inherent spall protection

CAMAC Spall Liner

CAMAC spall liner improves crew and platform survivability through the mitigation of behind armour effects.

NP Aerospace has specific expertise to form CAMAC spall liner to meet specific platform requirements including shaping to complex geometries and integrating with existing fixtures. This reduces joins whilst increasing the protection level and space available within a vehicle.

Used in combination with CAMAC structural or appliqué armour, CAMAC spall armour also offers enhanced protection from Improvised Explosive Devices (IEDs) and artillery fragments.

CAMAC Spall Liner is available in a range of materials including Glass Fibre Reinforced Composite, Aramid Reinforced Composite and Ultra High Molecular Weight Polyethylene (UHMWPE).

GLASS FIBRE REINFORCED COMPOSITE

Glass Fibre Reinforced Composite spall liners have a low density (~2gcc) with good mix of physical properties including excellent mechanical strength combined with ballistic and fire / smoke performance. The high tensile and compressive strength of glass fibre are key factors to both ballistic and mechanical performance which allows the panels to be used in structural applications.

ARAMID REINFORCED COMPOSITE

Aramid Reinforced Composite spall liners have a very low density (~1.4gcc) and display good physical properties. They can be used to support light loads and provide high ballistic and fire / smoke performance. Aramid systems are effective at reducing spall cone angle during overmatch scenarios.

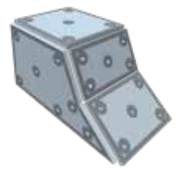
ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Ultra High Molecular Weight Polyethylene (UHMWPE) spall liners offer exceptional ballistic performance at a very low density (~1gcc). UHMWPE provides the highest ballistic efficiency offering high baseline V50 performance and the largest reduction in spall cone angle for a given mass.

KEY BENEFITS

- Increased coverage, reduced fixing points and reduced assembly time (shaped spall liners)
- Enhanced protection when combined with CAMAC Appliqué or Structural armour
- Ability to form shaped spall armour – reducing interfaces, increasing protection and space efficiency.

NP Aerospace offers cost effective flat panel spall liner kit, or performance optimised single piece shaped spall liner to increase coverage and survivability. For a <5% increase in mass, effective coverage is increased 35%.



Flat panel spall liner (mass = 12.3 kg, effective coverage = 0.36 m^2)

Single piece shaped spall liner (mass = 12.8 kg, effective coverage = 0.55 m^2)

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