

ASPRO family brings protection together for armoured fighting vehicles

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Key Points

- Rafael's ASPRO family of protection packages can be integrated onto new or existing platforms
- Family comprises active and passive protection technologies

A new range of protection systems known as ASPRO (Armoured Shield PROtection) are being marketed by Israel's Rafael Advanced Defense Systems.

Designed to enhance the survivability of armoured fighting vehicles (tracked and wheeled) against a variety of battlefield threats, the packages are aimed at both the upgrade and new-build markets.

ASPRO-A (Trophy) is the active defence member of the family and is now in quantity production for the Israel Defence Force's (IDF) Merkava Mk 4 Main Battle Tank (MBT), with an initial order of 100 units.

Further development has resulted in ASPRO-A-L (Trophy Light), which is designed to be installed on smaller AFVs, such as the widely deployed M113 series of full-tracked armoured personnel carriers (APC).

Trophy Light is based on the same principles of operation as the production Trophy system with three phases of operation - threat detection, threat tracking and finally activation of the hard-kill mechanism that neutralises the threat using a countermeasure before it impacts the platform.

The system uses the same four flat-panel radar antennas as the standard Trophy package but has a smaller and more compact launcher that uses a smaller countermeasure.

One launcher is mounted on either side of the hull top, each of which can be reloaded automatically, as is the case in the current production Merkava Mk 4 system, minimising the crew's exposure.

Trophy Light weighs about 500 kg, whereas the standard Trophy system weighs about 800 kg. Development of this version is almost complete and it is scheduled to undergo company field trials in [Israel](#) in the fourth quarter of 2008.

The third member of the ASPRO-A family is the ASPRO-A-UL (Ultra Light), which was recently shown integrated onto a Wolf (4 x 4) internal security vehicle, as used by the IDF.

Again, this uses the same four antennae as the earlier versions, but has a single pedestal launcher mounted on the roof that can be quickly traversed

through 300 degrees onto the incoming target. It has a number of countermeasures and is reloaded manually.

The company's armour systems have now been streamlined into two families, ASPRO-H and ASPRO-P.

ASPRO-H is a hybrid (combination of reactive and passive) armour technologies that is claimed to provide enhanced protection against a variety of battlefield threats including armour piercing projectiles, high-speed fragments of artillery, mortar bombs and high-explosive roadside mines up to STANAG 4539 Level 5.

The package has already been sold to a number of export customers for integration onto existing platforms and current systems incorporate low-burning rate (LBR) energetic materials. A version of this has been fitted to the US Army's Bradley Infantry Fighting Vehicle.

A further development of this, called ASPRO - HMT (MTAP), is a multi-threat hybrid armour system that it is claimed will defeat the Explosively Formed Penetrator (EFP) warheads, recognised as the single-most dangerous threat to vehicles in [Afghanistan](#) and [Iraq](#).

ASPRO-P, the passive member of the family, is in service with a number of countries and can be integrated onto a number of tracked and wheeled vehicles.

Incorporated into this range is the Enhanced Appliqué Armour Kit (EAAK), which was developed for the US Marine Corps for installation on its Amphibious Assault Vehicle 7 (AAV7) fleet. Other users of ASPRO-P include the IDF, [Italy](#), [South Korea](#) and [Poland](#).

ASPRO-P is a lightweight combat-proven passive add-on armour that is of modular design and uses a number of different materials according to the level of protection required, up to a maximum of STANAG 4539 5.

These materials typically include ceramics, metallic, composite materials and shaped and laminated configurations to provide a high level of protection.

It absorbs the energy from explosions to prevent penetration; it can be quickly fitted or removed from a vehicle that has the required mounting points.

Mines are an increasing danger in many parts of the world and against this background Rafael has developed ASPRO-PAM (Anti-Mine).

Fundamentally this is an enhanced ASPRO-P, designed to protect the belly and sponson areas of combat vehicles against anti-tank mines, blast charges and improvised explosive devices.

Mounted onto the bottom of the vehicle, its laminated configuration absorbs the blast energy and prevents rupture of the vehicle belly or sponson. The floating floor is made of absorbent materials and spall liners protect against fragments.

Vehicle seats, suspended from the sides or roof, or in a collapsible configuration, attenuate the acceleration affecting the crew when a mine is activated.



Wolf (4 x 4) internal security vehicle fitted with ASPRO-A-UL (Trophy Ultra Light) and showing antenna and pedestal-mounted launcher. (Christopher F Foss)

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Royal Netherlands Army YPR 765 tracked vehicle deployed to [Afghanistan](#) fitted with ASPRO-H armour package. (Rafael)

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M113 APC fitted with ASPRO-H armour package, RAFAEL Remote Control Weapon Station armed with a cannon and ASPRO-A-L (Trophy Light) showing antenna mounted either side above hull rear. (Christopher F Foss)

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