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Life-saving technology from Rheinmetall: made-to-measure force protection systems for modern military operations

Rapid technological advances are making intelligent weapon systems smarter and more effective than ever. Rheinmetall has specialized for many years in developing and producing high-quality components and innovative systems for protecting people, vehicles, aircraft, ships and installations, and offers a wide range of highly effective active, passive and softkill protection solutions. Prominent examples are active protection systems as well as combat-proven passive protection solutions for the Leopard 2 – all thanks to the Group's unsurpassed expertise with this main battle tank, which is one of the best combat systems in the world. Moreover, as a systems supplier, Rheinmetall offers made-to-measure protection solutions for every type of platform. A growing customer base attests to Rheinmetall's experience and competence in this field. At FIDAE 2014 the Düsseldorf, Germany-based Group is displaying a representative selection of its state-of-the-art systems and solutions for force protection.

Passive and active protection systems

Rheinmetall Chempro supplies add-on armour, spall liners and anti-mine seats which are decoupled from the floor of the vehicles. These features provide the crew with reliable protection from RPG attacks, APFDS-T rounds, antitank guided missiles with a tandem shaped charge, and landmines. All of these components are in service and combat proven. They can be retrofitted into existing systems without impairing the vehicle's mobility and functionality.

Proven and in series production, the modular Active Defence System (ADS) is the world's most advanced and effective standoff hard-kill system, providing protection for military vehicles of every weight class from operational threats. ADS is a modular system capable of defeating air-to-ground missiles, RPGs and overflying top attack threats. Its distributed sensor and effector array ensures redundancy and therefore protection against multiple simultaneous threats. The early warning sensor system detects incoming projectiles such as shaped charge warheads or antitank guided missiles. In a matter of microseconds, the system activates a protective sector and neutralizes the incoming object by means of a countermeasure before it reaches its target. Because it operates in a downward direction, ADS is the only high-performance close-quarters protection system that significantly reduces collateral damage, which is limited to the immediate vicinity of the vehicle.

ADS is already in service in several countries. Moreover, trials and negotiations are currently underway with several NATO and non-NATO countries that have performed a vehicle protection gap analysis and realized that they need an active protection system like ADS.

Maske 66/76 mm

The Maske 66/76mm is a combat-proven IR smoke screening grenade that significantly reduces the accuracy of enemy fire by interrupting the line of sight (LOS) in the visible and infrared wavebands. It protects vehicles from visual and infrared observation as well as from sensor-guided weapons, including laser beam-riders, laser illuminators and laser rangefinders. Maske is based on a bi-modular, multi-spectral ammunition concept consisting of a rapid reaction jamming module that produces intense over-radiation, coupled with a long-duration module for generating visual and infrared screening. Maske 66/76 mm is in service with several South American armies.

Rheinmetall ROSY: State-of-the-art protection at sea and on land

Rheinmetall's 40mm Rapid Obscurant System (ROSY) is a countermeasure system designed for both naval and land applications.

The land version – the ROSY_L system – provides light military and civilian vehicles with 360° protection against conventional weapons, weapons with optical devices and laser rangefinders (TV-, EO-, IR-, IIR-, laser- and SACLOS-guided weapons). Unlike conventional smoke protection systems, ROSY not only produces an instantaneous, large-area, multispectral interruption of the line of sight, but due to its rapid blooming time and airburst rounds also generates a dynamic smoke screen, capable of providing vehicles on the move with sustained protection from multiple attacks.

The naval version ROSY_N is optimized for protecting small vessels such as fast attack craft, patrol vessels and rigid hull inflatable boats (RHIB). ROSY_N creates a 1,000 square-metre multispectral smoke screen in just 0.4 seconds and can counter multiple threats without reloading. This helps to protect sailors, coast guards and special operations forces units operating in coastal waters and on rivers to defend themselves from sudden flat trajectory fire, such as small arms fire, RPGs and missiles.

Rheinmetall MASS: piggyback naval countermeasure system for added punch

Not on display at FIDAE 2014 but in service with several navies of the world is Rheinmetall's Multi Ammunition Softkill System (MASS). MASS protects ships from attacks with modern, sensor-guided anti-ship missiles on the high seas and littoral zones as well as from asymmetric, terrorist-type threats by firing decoy rounds which divert incoming missiles from their intended target.

MASS has proven highly effective in various international trials. The system's innovative, programmable omnispectral rounds – 32 per launcher – assure protection

in all relevant wavelengths of the electromagnetic spectrum (radar, infrared, laser, electro-optic, ultraviolet). MASS can be installed on board any type of ship, and operates either in standalone mode or as an integral part of the ship's networked C4I and weapon engagement systems. Using information from on-board sensors, MASS calculates the best countermeasure solution to defeat the incoming threat. Fully trainable in azimuth and elevation, MASS then fires the decoys, placing them in the optimum position. The advantage of MASS is that the ship does not have to manoeuvre in order to achieve an effective countermeasure solution.

In addition to the standard MASS configuration, Rheinmetall offers two optional versions, MASS_DUERAS and MASS_ISS.

The MASS_DUERAS is a piggyback solution. It features launching tubes for distraction rockets mounted on top of the MASS launcher. In 2009 Canada chose the MASS_DUERAS as standard equipment for the upgrade program of its Halifax-class frigates. An optional add-on anti-torpedo capability will also be available soon.

The MASS Integrated Sensor Suite (ISS) configuration features its own sensors for detecting radar, laser and electro-optical threats, and has now been extended to include "NavGuard", an active missile approach warning device. NavGuard is capable of detecting small incoming guided missiles such as MILAN, Sagger or Fagott, and thus closes a vulnerability gap when it comes to protecting vessels in littoral zones.

MASS offers a whole host of tactical, operational and logistical advantages, and is specifically designed to meet the changing requirements of modern navies, with abundant scope for future technological growth.

Since its market launch in 2002, thirteen nations have ordered a total of 200 MASS launcher systems for no fewer than 25 different types of vessels. One of the latest customers is the Algerian Navy, which has procured two MASS_4L for its Meko A200 frigates, each with a four-launcher configuration including MASS_DUERAS long-range firing and distraction capability.

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