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Live fire: the acid test

Rheinmetall and ADS GmbH demonstrate their innovative ADS force protection technology for tactical vehicles

Rocket-propelled grenades, antitank guided missiles and explosively formed projectiles (a particularly pernicious type of IED) all pose a severe threat to troops deployed in modern conflict and post-conflict situations. Produced by Rheinmetall and ADS GmbH, the newly developed Active Defence System (ADS) is a reliable countermeasure, as demonstrated during recent live fire testing at Rheinmetall's test centre at Unterluess in northern Germany, conducted in the presence of some 120 experts from ten nations.

ADS is the world's most advanced and effective standoff system for protecting military vehicles in practically every weight class from contemporary operational threats. It operates according to the hard-kill principle. The sensor system detects an incoming projectile as it draws close to the vehicle, e.g. a shaped charge or antitank missile. Then, in a matter of microseconds, the system activates a protection sector, applying directed pyrotechnic energy to destroy the projectile in the immediate vicinity of the vehicle. Owing to its downward trajectory, ADS minimizes collateral damage in the zone surrounding the vehicle.

At the beginning of 2011, a Fuchs/Fox 1A8 armoured transport vehicle was fitted with a complete ADS system in order to test its capabilities on a 6x6 vehicles. Aside from showing that ADS could be integrated into an existing platform without significantly altering the basic parameters of volume, weight and electrical output, mobility and handling trials had to be conducted at Defence Technology Detachment 41 in Trier, which were successfully completed in June 2011. Because additional system tests on the vehicle were planned, it was decided to conduct a dynamic ballistic test by firing an RPG7 ("Panzerfaust") at the vehicle.

At the Rheinmetall testing centre at Unterluess, a vehicle was used to tow the ADS-equipped Fuchs/Fox with a steel cable at a speed of 20 km/h. Triggered by a pressure detonator of the type commonly used to set off IEDs in urban areas and along routes of march, an RPG was fired at the side of the vehicle from a distance of 18 metres. The small standoff was intended to demonstrate ADS's unique effectiveness in responding to an attack at close quarters, while simultaneously assuring that the detonator of the shaped charge was armed.

The ADS sensors detected the attack, identified the incoming projectile as a threat and immediately initiated its destruction. Its residual impact was insufficient to

penetrate the vehicle's armour, and was in fact so weak that the vehicle was able to drive away under its own power after being fired on.

Located just 150 metres away, the spectators could watch the live presentation while standing in the open, with no need for special protection, and were then able to inspect the vehicle following firing.

Importantly, the demonstration with a Fuchs/Fox also showed that the ADS system could be used very effectively in making legacy vehicles a match for the challenges of the modern battlefield.

ADS Gesellschaft für aktive Schutzsysteme mbH, in which Rheinmetall AG of Düsseldorf owns a 74% share, with the remainder held by IBD GmbH of Lohmar, Germany, has since booked a first serial order for the system.

A number of armies are currently displaying great interest in ADS technology. Experts put the number of vehicles that need to be retrofitted with active protection systems of this type in the tens of thousands.

Rheinmetall's all-encompassing protection concept

It takes a sophisticated combination of active and passive protection systems coupled with soft-kill systems to provide military vehicles a level of crew survivability commensurate with current threats.

This is why Rheinmetall has been systematically expanding its technology portfolio, adding new capabilities through a series of carefully targeted acquisitions. By drawing on the expertise of companies like Rheinmetall Chempro GmbH, Rheinmetall Verseidag Ballistic Protection GmbH and ADS Gesellschaft für aktive Schutzsysteme mbH, the Group is now able offer a unique array of innovative force protection capabilities.

Protection in accordance with the "onion principle"

Rheinmetall's comprehensive protection concept is based on a multi-layer approach, with ADS – the outer-most layer of defence, as it were – constituting an especially efficient and innovative solution in that combats incoming threats before they even reach their target.

Passive solutions form an indispensable second line of defence; these include add-on armour made of composite or ceramic materials. Here, Rheinmetall is pressing ahead with the development of new technologies, enabling it to supply military customers with complete protection concepts from a single source, e.g. bullet-resistant driver's cabs for logistics vehicles and trucks.

Rounding out the Rheinmetall protection concept is a variety of high-performance soft-kill solutions, which the Group supplies not only for ground vehicles but also for

fixed-wing aircraft, helicopters and ships. Smoke/obscurant systems such as “Rosy” render vehicles invisible to the enemy in the event of an attack, while Rheinmetall’s MASS naval countermeasures system now sets the standard worldwide.

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