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120mm tank ammunition from Rheinmetall: enhanced firepower for modern combat operations

Combining firepower, protection and mobility, modern main battle tanks today are equipped with high-performance day and night-time optics as well as advanced C4I and communications systems. Various claims to the contrary notwithstanding, tanks continue to make a major contribution on the modern battlefield – even against opponents employing asymmetric tactics in urban environments.

In order to further enhance the combat effectiveness of MBTs, Rheinmetall has developed two new types of 120mm tank ammunition: the DM11 and the HE SQ Rh31. Both can be fired from any currently fielded 120mm smoothbore gun (L44 and L55), and are intended to widen the operational spectrum of modern tanks, making sure they remain a match for the steadily evolving threat.

Rheinmetall developed its 120mm x 570 DM11 cartridge on behalf of the German Ministry of Defence. From the technical standpoint, it is characterized first and foremost by the programmability of the chambered round and by its airburst capability. The necessary system modifications (programmability) can be retrofitted into any modern MBT with a 120mm smoothbore gun. Modular in design, the DM11 consists of warhead with a programmable fuse as well as a ballistic cowl, tailfin assembly, drive band, combustible casing with propelling charge, and a newly designed case base containing the primer and an integrated data cable for programming.

The interfaces between the drive and the warhead ensure that the drive can be subsequently exchanged at a reasonable cost to extend the round's service life, or fitted in future with a different type of fuse or warhead. Another unique performance characteristic: this ammunition is safe to fire in all climate zones (-46°C to +71°C).

The DM11 is designed for engaging lightly armoured targets such as vehicles, antitank positions (whether dug-in or in the open), field fortifications, double reinforced concrete walls as well as earth and timber bunkers . Furthermore, thanks to its high precision and maximum effective range of up to five kilometres, it can be used for penetrating barriers and engaging targets taking cover behind walls, etc., as well as for breeching enemy defences and creating avenues of approach for friendly forces in built-up areas.

In order to maximize the round's range of applications, it can be employed in three different fuse modes:

- Impact fuse mode/point detonation (PD); here the warhead detonates inside the target medium in order to create a larger breech;

- programmable delay/point detonation with delay, (PDwD); here detonation of the warhead takes place following penetration of cover;
- programmable airburst (AB) mode; in this case the warhead detonates either ahead and above the intended target in order to achieve a maximum effectiveness, at ranges of up to 5,000 metres.

Under the name “Multi Purpose (MP) DM11”, the US Marine Corps already uses the DM11 for engaging lightly armoured targets in asymmetric conflict situations.

Rheinmetall also offers a lower-cost variant of this cartridge, the HE SQ (“High Explosive Super Quick”) Rh31. It features an impact function without delay. The cartridge can be fired with no need for modifying existing systems. It can also be used in all climate zones. Due to its also modular design it has the potential to be cost-effective upgraded to the DM11.

Another innovative Rheinmetall product in the field of modern tank ammunition is the 120mm KE DM63 which is the world’s first temperature independent high-performance tank round. As opposed to conventional tank ammunition, there is no decline in the new round’s terminal ballistic performance at temperatures below +21°C. The 120mm KE DM63 can be fired at temperatures ranging from –46°C to +71°C (Climate Zones C2–A1), a world first. In combat, the temperature-independent muzzle velocity results in a superior first-shot kill probability at all temperatures.

Rheinmetall uses a special state-of-the-art tungsten penetrator that is capable of overcoming the most extreme cutting and bending forces of double-reactive armour. This makes it possible to defeat all known types of tank armour, including multi-layer and composite arrays and reactive armour systems at all ranges of engagement. Even at long ranges of engagement, it can perforate the main armament behind the double-reactive armour front module of modern MBT. Fired from L44 and L55 tank barrels, the ammunition is extremely accurate.

In addition, for training purposes, Rheinmetall supplies low-cost practice rounds for each type of service ammunition. The TP cartridge CSDS-T DM78 for the KE service round and the newly developed full-calibre TP cartridge for the Group’s family of HE service ammunition are slated to go into series production starting in 2014, with the latter receiving a new model number.

At IDEX 2013 the Group is displaying all these new 120mm tank rounds, optimized to meet the needs of the modern battlefield. Rheinmetall, one of the most trusted names in the global defence industry, has already booked the first orders from Leopard 2 and M1 Abrams user nations.

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