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## **Rheinmetall – the leading one-stop-shop for 40mm systems**

In the infantry toolbox, the versatile 40 mm ammunition pallet closes the gap between hand grenade and mortar. It therefore serves as a veritable combat multiplier for infantry and other dismounted troops. Rheinmetall is one of the world's leading suppliers of ammunition, weapon systems and fire control systems and therefore acts as a one-stop shop for 40mm systems.

Widely used today, the Group's 40 mm x 46 low-velocity ammunition (LV, velocity: 78 m/s) is available in many different versions, including HE/fragmentation, shaped charge with fragmentation jacket (HEDP/high explosive dual purpose) as well a number of other service and practice rounds, together with non-lethal payloads such as kinetic impact munitions or irritant. The range of ammunition is constantly being expanded and new capabilities added. Rheinmetall's 40mm LV ammunition can be fired from all standard standalone and underslung grenade launchers such as the M79 "Blooper", the M320, HK269, Milkor launchers, the M203 and the SCAR EGLM/ Mk13 Mod 0.

Rheinmetall is now the leading maker of new 40mm medium-velocity (MV, ca. 100 m/s) ammunition. This product portfolio includes the new generation of 40mm MV ammunition, which has a maximum effective range of 800 metres, doubling the operator's reach and providing a flatter trajectory for those crucial close-in, accurately placed shots. Rheinmetall's MV ammunition is currently undergoing NATO qualification. The 40mm MV ammunition family will soon be available in service and practice versions. It can be used with the multi-shot grenade launchers Milkor US M32A1 and AV 140. Furthermore, Rheinmetall's 40mm Magazine-Fed Grenade Launcher (MFGL) is currently under development.

The Group's 40 mm x 53 high-velocity ammunition reaches a velocity of 240 m/s and has a maximum effective range of 2,200 metres. Here, too, the Group supplies a wide assortment of different cartridges, including newly developed HE and HEDP airburst ammunition, programmed by an infrared programming unit.

The new multipurpose 40mm HV-HEDP IM ESD (High Velocity-High Explosive Dual Purpose, Insensitive Munition, Electronic Self-Destruct) cartridge is ideal for engaging and defeating lightly armoured and soft targets. It has a newly developed shaped charge cone capable of penetrating 80 millimetres of rolled homogeneous armour (RHA) grade K.



It is the only 40 mm ammunition on the market today with this kind of penetration performance. A unique nose fuse incorporating an electronic self-destruct (ESD) mechanism is optimized for high-sensitivity detonation against both hard and area targets. This system results in a dud rate significantly below that of a typical pyrotechnic or spin decay self-destruct mechanism.

The excellent accuracy of the Rheinmetall 40mm HV-HEDP cartridge is a result of its patented, proprietary propulsion unit. At extreme temperatures, e.g. resulting from a fuel fire, the RWM 40mm IM's improved propulsion system prevents separation of the projectile and propulsion unit. The 40 mmx53 HEDP IM ESD is equipped with qualified IM explosives. The 40 mm HV-HEDP IM ESD grenade is suitable for use in all NATO-standard weapon systems, including the HK GMG, as well as the MK19 and the MK47 grenade launchers.

Rheinmetall's programmable 40 mm x 53 Airburst Munition (ABM) constitutes another important new capability, allowing troops to engage targets (e.g. snipers) taking cover in trenches, behind stonewalls, etc. The Group's 40 mm x 53 ABM is fully qualified for use by the Bundeswehr and Dutch armed forces. The Bundeswehr has fielded this ammunition under the designation DM131.

Rheinmetall's family of fire control systems enhances combat effectiveness enormously. It provides users with a broad range of enhanced capabilities, increasing the effectiveness of the gunner while maximizing the potential of the host weapon system and munitions being utilized. The family consists of different fire control solutions, providing increased accuracy and performance: Vingmate FCS 4500 for high-velocity automatic grenade launchers and heavy machine guns, MR-500 and MR-800 for low- and medium-velocity 40mm grenade launchers and Vingmate SL 1000 for shoulder-launched weapons.

The Vingmate FCS 4500 fire control system is one of the world's leading fire control systems for automatic grenade launchers. It is fitted with a thermal imager, a combined tripod and gun cradle. It is thus suitable for various 40mm automatic grenade launchers such as the MK19 and HK GMG but also for heavy .50 cal. machine guns like the FN M2/ Browning M2, or even 20mm automatic cannon such as the GAM B01. Vingmate FCS 4500 is designed to permit programming of airburst rounds via an infrared laser beam as they leave the barrel.

The MR-800 and MR-500 can also programme airburst rounds via infrared signal. While the MR-800 features an integrated IR programmer, a similar unit can be connected to the MR-500. The MR-500 is a manually adjusted clip-on aiming system specifically developed for low- and medium-velocity 40mm grenade launchers and shoulder launched rockets (e.g. M72/AT4). Incorporating an infrared target marker, an infrared illuminator and a red dot sight, the device weighs only about 11 ounces (300 grams). It is suitable for both underslung and standalone grenade launchers. The system can also store variable ballistic tables, two of which can be selected using a dedicated selector switch. The MR-500 is suitable for left-handed and right-handed shooters, and is powered by a CR123 battery. If desired, the MR-500 can communicate with external devices such as Rheinmetall's newly developed TAC-Ray Ballistic clip-on (rifle-mounted) laser rangefinder. The TAC-Ray Ballistic which is available in different variations is an extremely compact device capable of measuring targets out to 2,000 meters and includes visible and IR laser pointers and illuminators.

Once again, the manually adjustable MR-500, as an extension of the motor-driven MR-800 and Vingmate SL, underscores Rheinmetall's status as a one-stop shop for 40mm weapons technology, and other shoulder-launched weapons. It joins other fire control units from the Vingmate family such as the Vingmate FCS 4500 for automatic grenade launchers under contract with US SOCOM.

## **The U.S. market**

Rheinmetall continues to expand its role in the US as a major supplier of innovative 40mm ammunition to the U.S. Armed Forces. It has produced over 3.3M M1110 LV and 5M Mk281 Mod3 HV 40mm target day/night marking training cartridges to the USMC over the past decade and is on contract to produce 1.25M more MK281 Mod3 cartridges over the next 2 years.

Rheinmetall's M1110 and Mk281 Mod3 are non-dud producing, non-toxic training cartridges that use unique target marking technologies that enable both day and night training. Their designs eliminate unexploded ordnance and range fires which enable Warfighters to practice fire-and-maneuver operations in a safe, dud-free environment.

Rheinmetall's airburst technologies are also being used in current US Army developmental programs as part of their XM1166 LV and XM1176 HV HEDP cartridges. These cartridges will dramatically enhance the lethality of Warfighters by giving them the ability to more effectively engage enemy troops in the open or in defilade using airburst technology while retaining the point detonating ability to defeat lightly armored targets using only one type of cartridge.

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