



Rheinmetall Weapon Ammunition - Infantry

**40mm x 53 IR Airburst IM Ammunition & Automatic Grenade
Launcher Capability Upgrade Package
May 2011
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Lethality – what threat do we want to defeat ?

	Soft Targets		Medium Hard Targets
	Infantry no cover	Infantry taking cover	vehicles
HE	Green	Red	Red
HE ABM	Green	Green	Red
HEDP	Red	Red	Green
HEDP ABM	Yellow	Yellow	Green





Rheinmetall 40mm x 53 Automatic Grenade Launcher Upgrade Package

Rheinmetall's 40mm x 53 Automatic Grenade Launcher (AGL) Upgrade Package provides all current AGL's with the ability to fire programmable air burst munitions (ABM).

- ▶ The complete system consists of:
 - Rheinmetall 40mm x 53 ABM (HE or HEDP)
 - Rheinmetall Vingmate AGL Fire Control System (FCS)
 - Aimpoint Electro-optic Sight
 - Infrared (IR) Fuze Programming Unit (PU)

The Upgrade Package converts the AGL from an area suppression weapon to a precision weapons systems capable of engaging targets “one burst, one kill” out to 2,200 m.

- ▶ The Upgrade Package:
 - Greatly increases the first shot probability of hit (P_h)
 - Eliminates the need for “walking” fires onto the target
 - Provides airbursting and counter-defilade capabilities



The Rheinmetall 40mm x 53 ABM is available in both HE and HEDP versions and features an advanced IR-programmable fuze.



The Rheinmetall 40mm x 53 AGL Upgrade Package Overview



Weapon Stations

Soft Mount & Tripod



40mm x 53 AGL Upgrade Package: *The Ammunition*

Rheinmetall makes the 40mm x 53 ABM in both High Explosive (HE) and High Explosive Dual Purpose (HEDP) versions. Cartridge highlights include:

- ▶ Insensitive Munitions (IM) – compliant explosives and IM-compliant propulsion system
- ▶ 100% ballistic match between HEDP and HE cartridges for best compatibility in mixed belts
- ▶ Safe Separation Distance < 200m
 - M430: 300m
 - Diehl DM42: 400m
- ▶ Target Effects
 - HEDP – Penetration ≥ 80 mm RHA and >1000 Fragments
 - HE – Fragmentation > 1400 Fragments
- ▶ Electronic Self Destruct





The Ammunition: 40mm x 53 ABM IM Propulsion System

Both versions of the ABM cartridge use Rheinmetall's new IM Propulsion System

- ▶ Inside the propulsion system is an integrated IM venting device
- ▶ When an external heat source is applied to the cartridge, the IM venting device opens, thereby preventing the explosive separation of the projectile from the Propulsion System (the ammunition stays in the ammunition can.)

Advantage

- ▶ IM-compliant IAW STANAG 4439
- ▶ Integration of the IM Propulsion is planned for all Rheinmetall 40mm x 53 ammunition

Time line

- ▶ End of Development 1. Qtr 2010
- ▶ Start Qualification 2. Qtr 2010
- ▶ End of USMC Qualification 2. Qtr 2011





The Ammunition: 40mm x 53 ABM HE Cartridge



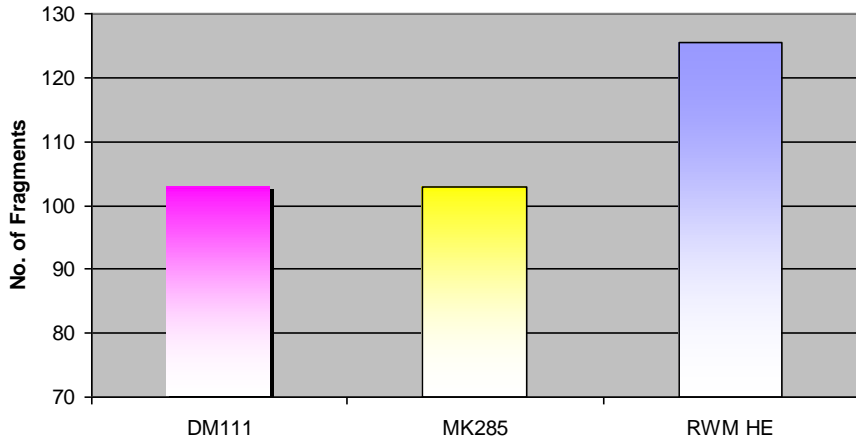
Technical data

Dimensions [mm]	Ø 40 x 112
Cartridge Weight	approx. 340 g
Range	2200 m
Ignition	Impact fuze
Velocity V4	240m/s
Number of fragments:	>1400
Fuze type:	Top fuze with SD Arming
Arming distance:	18 - 40 m
Self destruction:	20 sec.



The Ammunition: Lethality of 40mm x 53 ABM HE Cartridge

Lethality at 5m

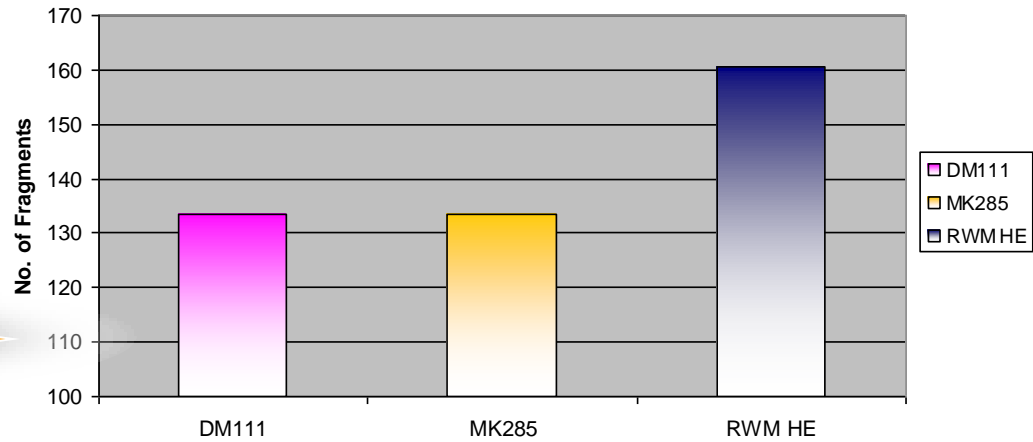


5m Distance
+ 25% Fragments



Lethality at 10m (No. Of Fragments)

10m Distance
+ 30% Fragments





The Ammunition: 40mm x 53 ABM HEDP Cartridge



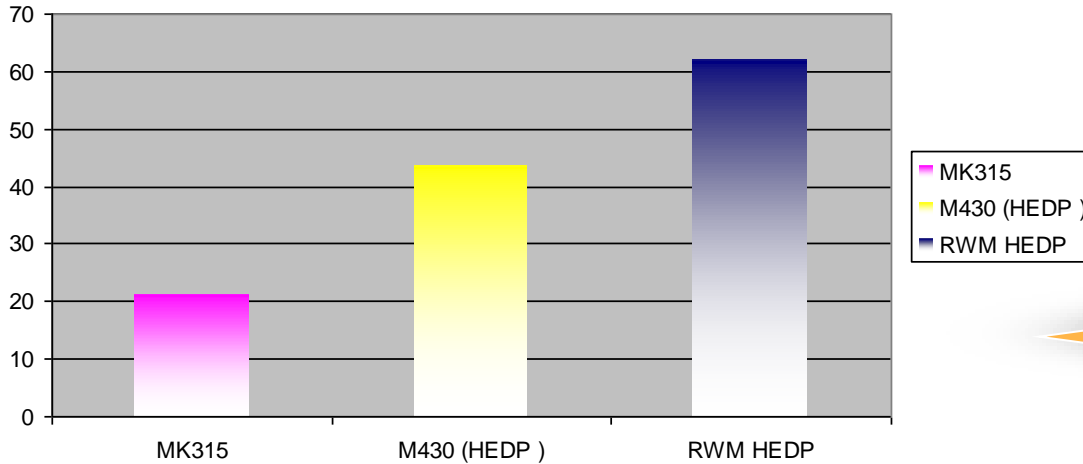
Technical data

Dimensions [mm]	Ø 40 x 112
Cartridge Weight	approx. 340 g
Range	2.200 m
Ignition	Impact fuze
Velocity V4	240m/s
Penetration Capability:	80mm RHA Steel
Number of fragments:	>1000
Fuze type:	Top fuze with SD Arming
distance:	18 - 40 m
Self destruction:	20 sec.



The Ammunition: Lethality of 40mm x 53 ABM HEDP Cartridge (1)

Lethality at 5m

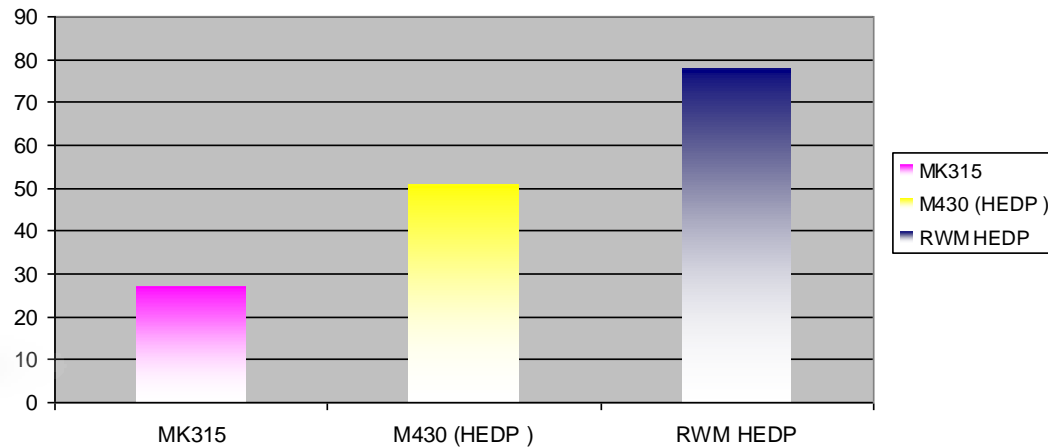


5m Distance
+ 25% Fragments



Lethality at 10m

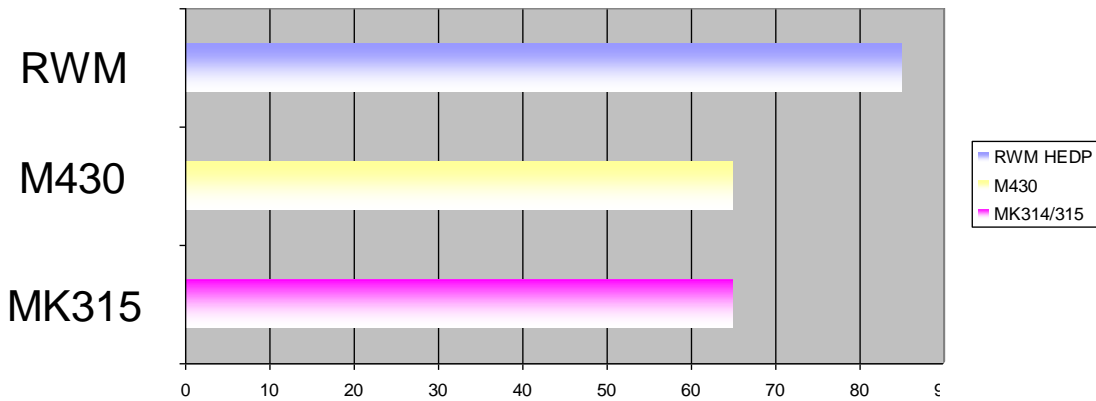
10m Distance
>+100% Fragments
(Nammo HEDP)
+ 40% M430





The Ammunition: Lethality of 40mm x 53 ABM HEDP Cartridge (2)

Penetration

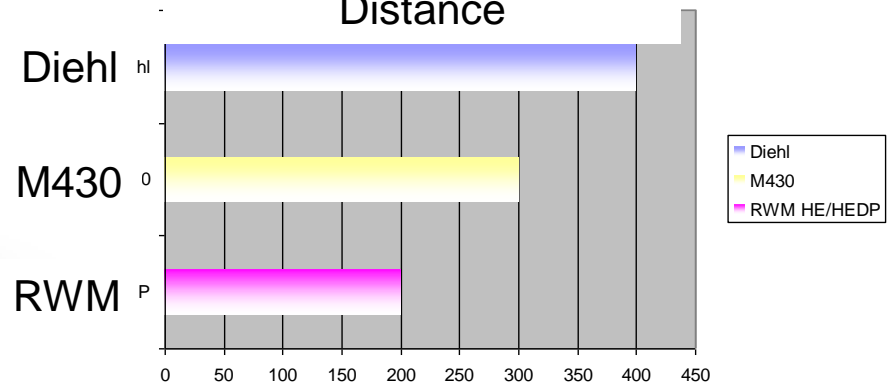


RWM gives 24% more penetration



Improved Gunner Safety

Safe Separation Distance





40mmx53 High Explosive Dual Purpose Shaped Charge Penetration on 80mm RHA Steel Class K





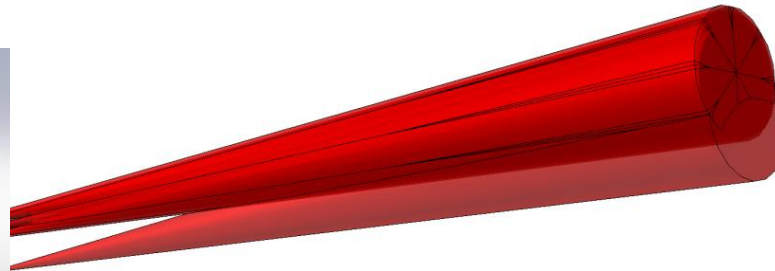
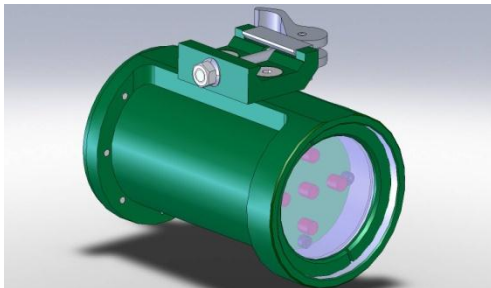
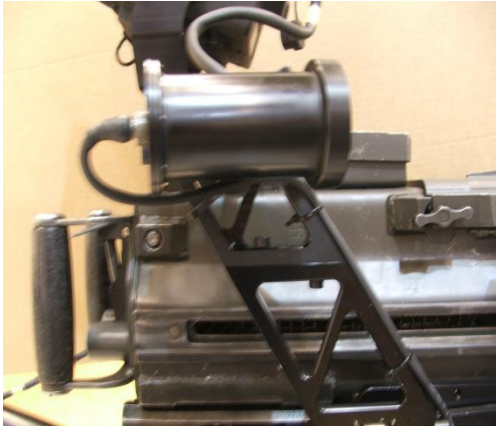
The IR Programming Unit: Affordable ABM capability

The Rheinmetall IR programming unit for the 40mm x 53 ABM cartridge has several unique advantages:

- No Jamming possible**
- No modification to existing MK 19, MK 47 and GMG launchers**
- Co-Location possible**
- Programming Device can be integrated in Vingmate FCS**
- Affordable**
- In House production**
- Construction kit**



The IR Programming Unit: 40mm x 53 ABM





VINGMATE

Automatic Grenade Launcher Fire Control System







Vingmate FCS: Highly Capable yet Simple-to-Operate

- **LRF**
- **Day Camera**
- **Ballistics Computer**
- **GPS**
- **DMC**



Modular design to meet user specific requirements

Prepared for future requirements



Vingmate FCS: Design Considerations

- **Ability to hit targets at long range**
 - Requires magnification
 - Requires sight to move in order to super elevate
- **Modularity - ability to mount other sensors and give them the same ballistic compensation**
 - Thermal sights
 - Laser pointers
- **Softmount mounting**
 - Reduce recoil effects
 - Improve first hit probability and grouping
- **Eliminate reliance on T&E**
- **Ease of Operation**



Vingmate FCS: Basic Operation

1. *Laze*
2. *Aim*
3. *Fire*

Gunner display presents distance to target and a ballistically corrected aim point (including spin drift compensation).



40MM HV ABM





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**RHEINMETALL
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Questions?

