



COMBAT SYSTEMS

Ground breaking ammunition with innovative designs to meet all land, air and navel combat requirements

Stephan Kerk / Joint Armaments Event # 4610 / 14.05.2014



Rheinmetall Defence: Leading Defence System Supplier



Combat Systems

Combat platforms

Infantry

Protection systems

Propulsion systems

Combat international

Electronic Solutions

Air defence systems

Defence electronics

Electro-optics

Simulation and training

Wheeled Vehicles

Logistic vehicles

Tactical vehicles



Conventional threat



Classic scenario
Similarly equipped armed forces





New challenges





Lesson learned

- Scenarios changed over the last years
 - Different levels (from peace keeping up to asymmetric war)
 - Scenario specific rules of engagements

- Requirements to ammunition performance
 - High penetration and controlled fragmentation capability
 - Air Burst capability
 - Avoid collateral damage
 - Effective against Urban Ops targets
 - Insensitive ammunitions (without explosives)

- Rheinmetall provides the right ammunition



Kinetic Energy



APFSDS

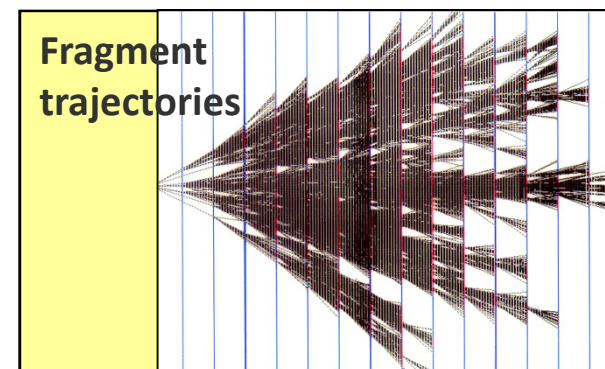
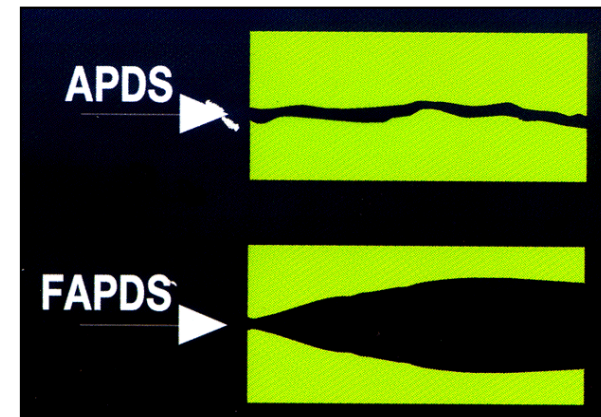
- Optimized ammunition to
 - Defeat hard and medium hard targets
 - Armoured Personnel Carrier
 - Infantry Fighting Vehicle
 - Successfully defeat vehicles of the same class
 - Effects
 - Optimized for penetration
 - Available
 - 25mm
 - 30mm
 - 35mm





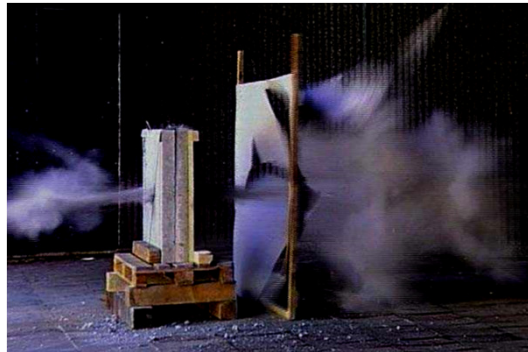
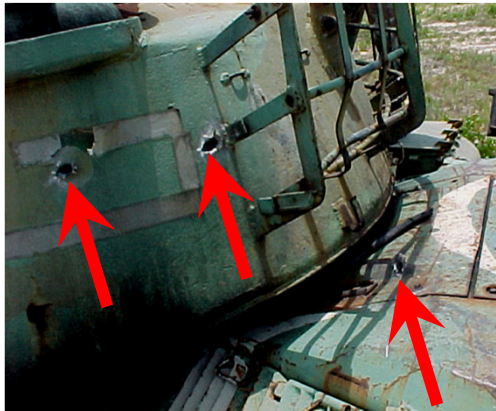
FAPDS

- Optimized ammunition to
 - Defeat hard, medium hard and soft targets
 - Armoured Personnel Carrier
 - Infantry Fighting Vehicle
 - Trucks
 - Urban Ops
 - Air targets
 - Naval targets
 - Effects
 - Excellent penetration
 - Fragmentation
 - Available
 - 25mm
 - 27mm
 - 30mm





Impressions KE technology





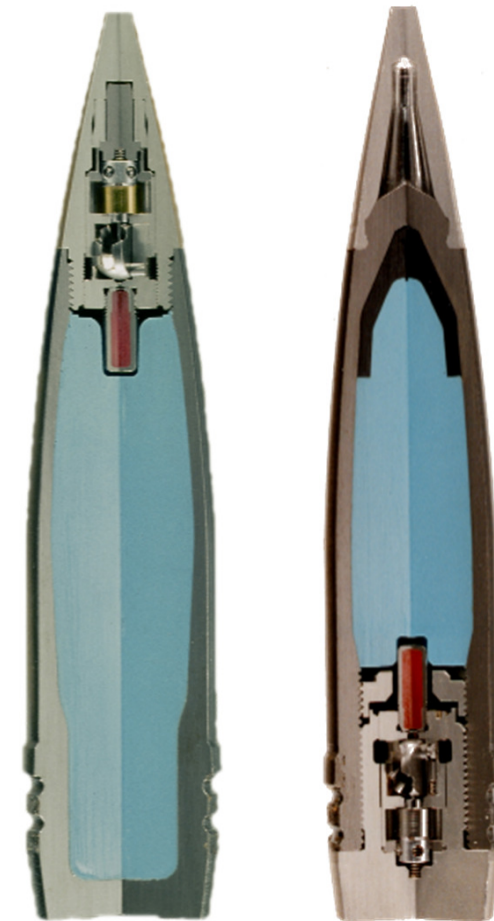
Fragmentation Round



HEI with nose or base fuze

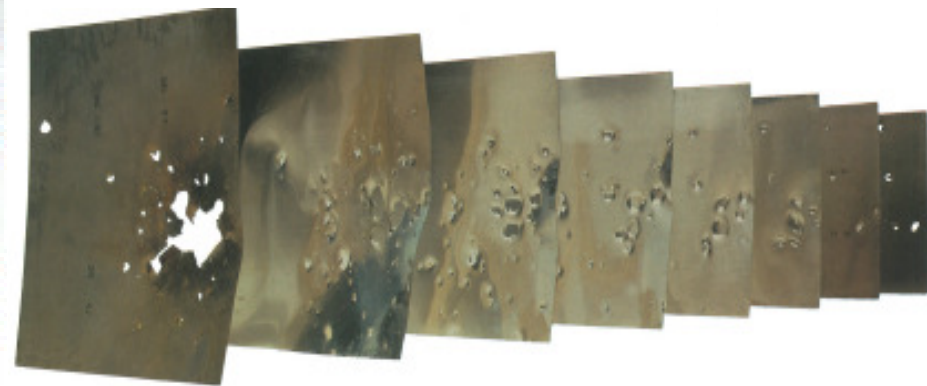
Ammunition optimized to

- **Defeat soft and/or medium hard targets**
 - Light armoured vehicle
 - Troops (suppression fire)
 - Air targets
- **Effects**
 - Fragmentation
 - Limited penetration
 - Incendiary effect
- **Available**
 - 20mm
 - 25mm
 - 30mm
 - 35mm





Impressions HEI technology





Frangible Armour Piercing Penetrator with Enhanced Lateral Effect



FAP and PELE

Ammunition optimized to

- **Defeat soft and medium hard targets**
 - Armoured Personnel Carrier
 - Vehicle
 - Urban Ops
 - Naval targets
 - Aircraft targets
- **Effects**
 - Penetration and fragmentation
- **Available**
 - 20mm FAP
 - 25mm FAP
 - 27mm FAP & PELE
 - 30mm PELE

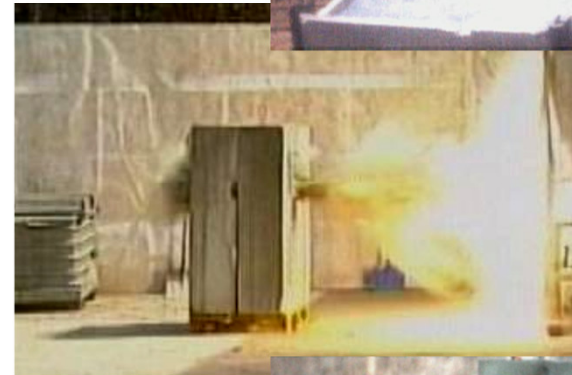




Future improvements

- Frangible ammunition with implemented marker – FAP Marker
 - Visible for the Pilot and other troops

- FAPPIE ammunition - Frangible Armour Piercing Pyrotechnical Induced Effect
 - Ammunition without explosive
 - High blast and sound effect after perforation
 - Or visible by hitting the target
 - Or a combination of both effects





25mm FAP for the F-35 Characteristics

■ Performance:

- One general purpose, Non-DU, Non-CO, 25mm round without explosives for both Air-to-Air and Air-to-Ground employment
- Effective against a wide range of targets:
 - Hard targets (IFV, armoured vehicles, also on long range)
 - Soft targets (trucks, helicopters, aircraft, ..)
 - Urban area targets
- Capable to defeat targets at long ranges as defined in Operational Requirements Document
- **First** round officially qualified for F-35A GAU-22A Gun by USAF / GDATP
- 25mm FAP official US designation: PGU-48/B

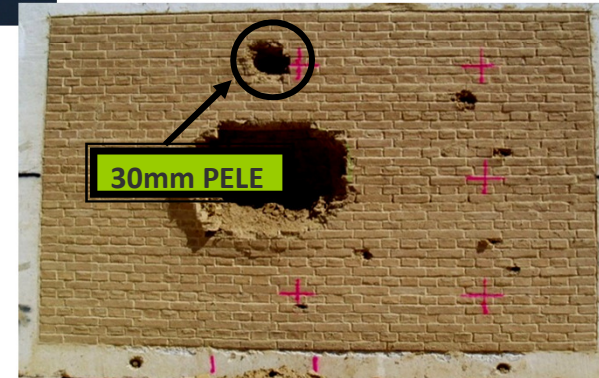
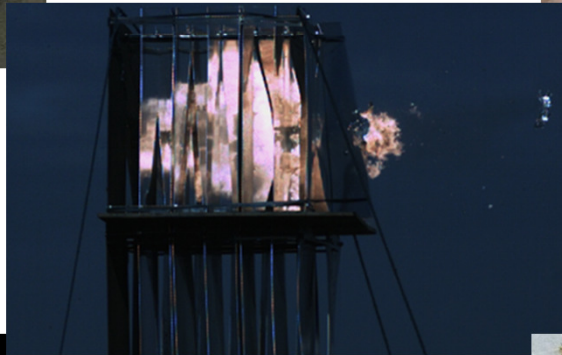
■ Status:

- USAF & RNLAf have procured rounds for Operational testing & Life Test firing





Impressions FAP and PELE





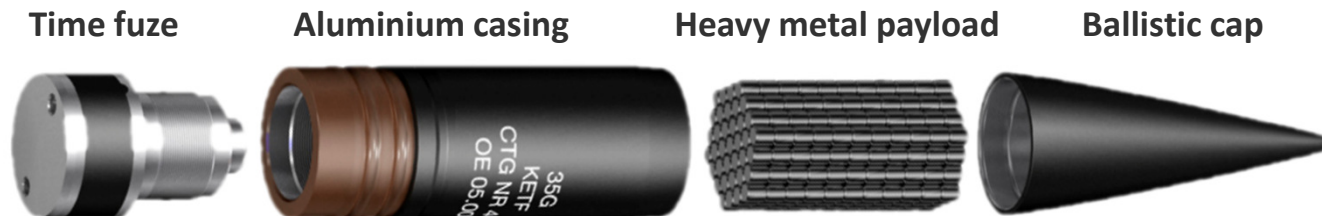
Kinetic Energy Time Fuze



KETF

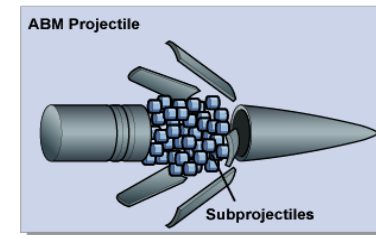
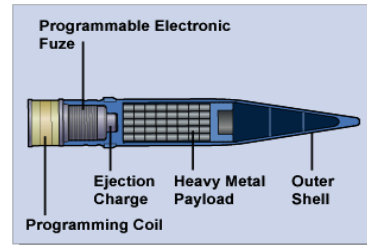
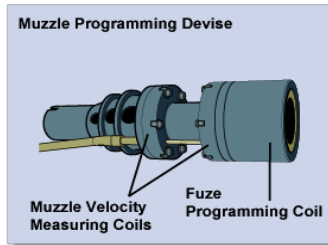
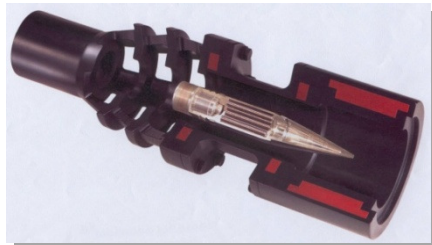
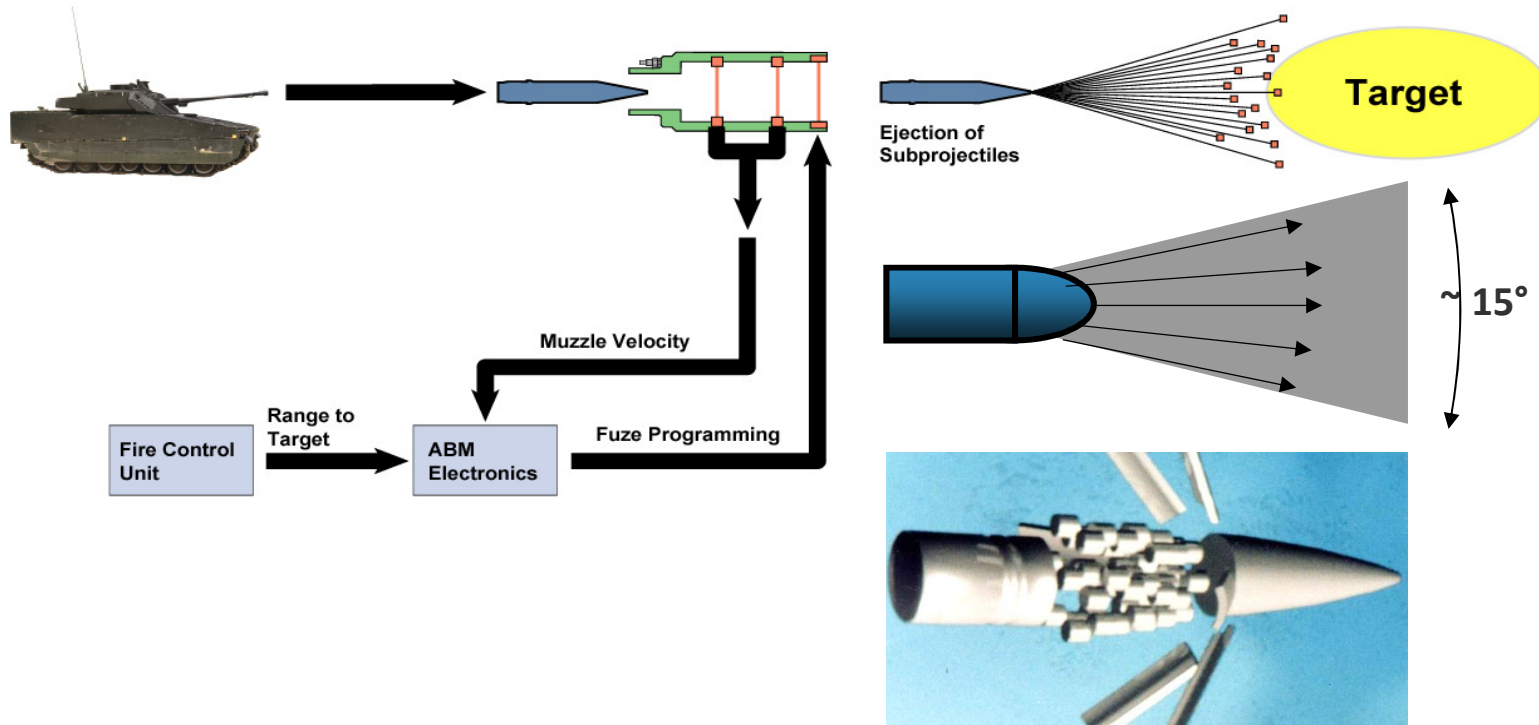
Ammunition optimized to

- **Defeat soft and/or medium hard targets**
 - Armoured Personnel Carrier
 - Vehicle
 - Urban Ops
 - Troops in the open or in prone
 - Naval targets
 - Airborne targets
- **Effects**
 - Fragmentation and penetration
- **Available**
 - 30mm
 - 35mm





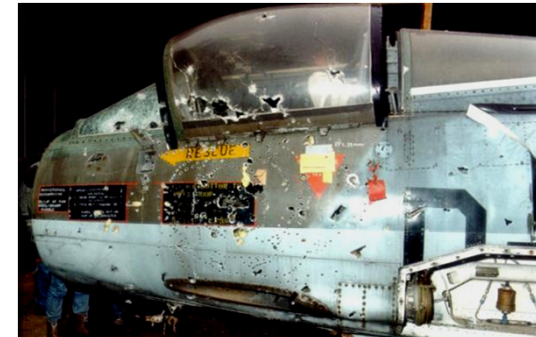
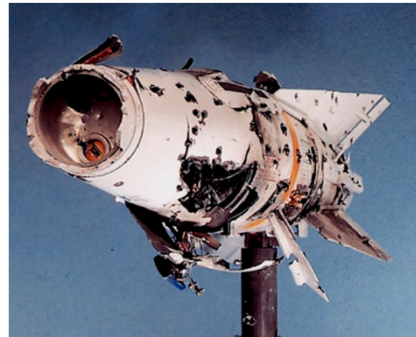
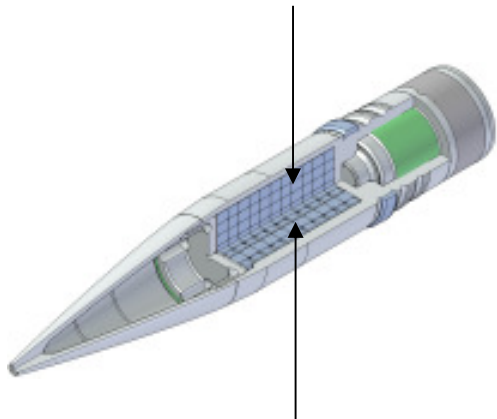
ABM-KETF Functional Descripton



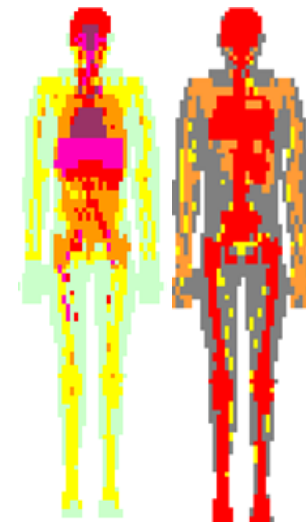


KETF Sub-Projectile Optimization

- 35mm for Air Defence against aircraft and helicopters: optimal sub-projectile size is 3,3 gram

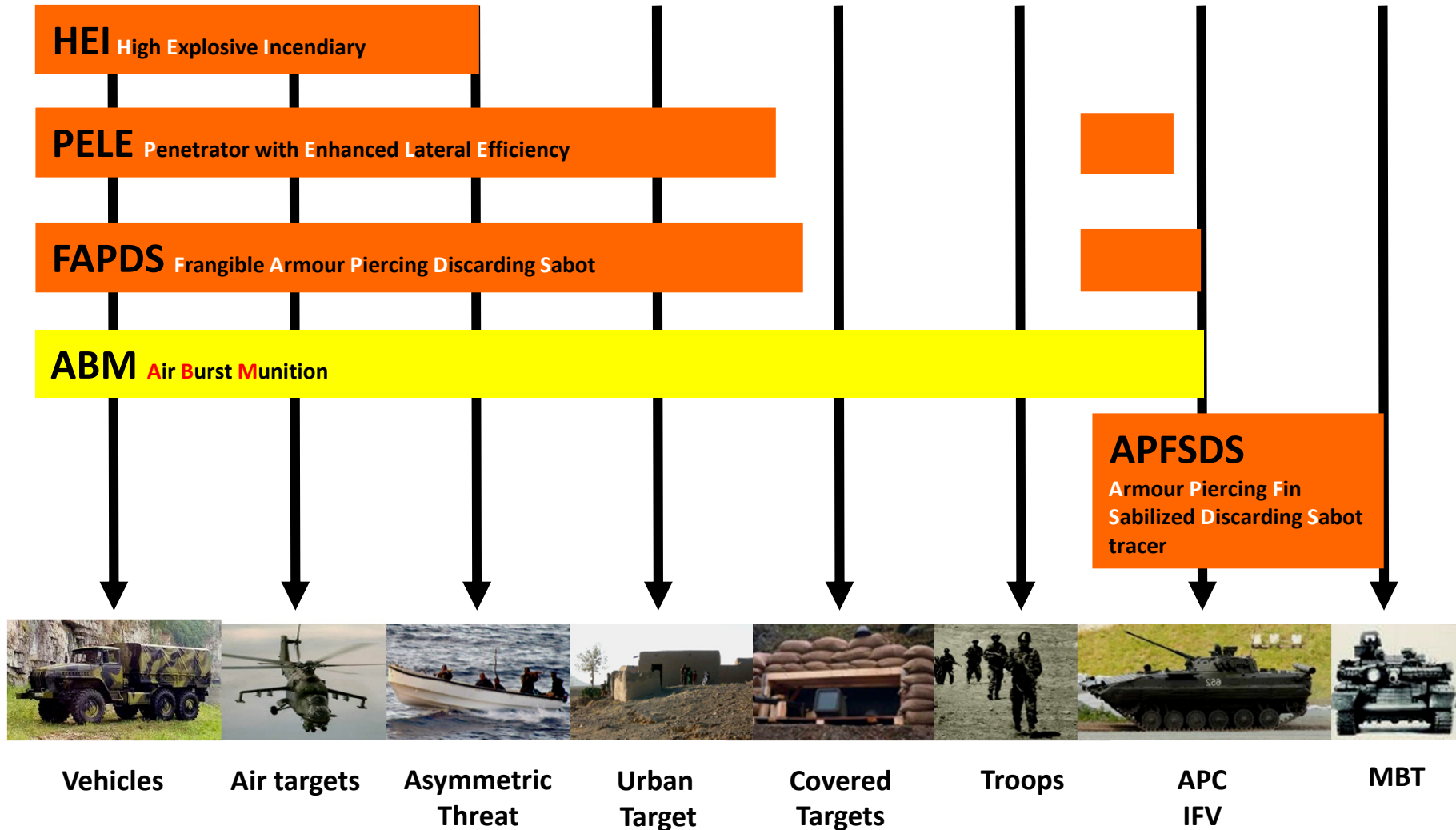


- 30mm and 35mm for IFV against ground targets: optimal sub-projectile size is 1,24 gram





Medium Calibre Ammunition Effectiveness against all Threats





Thank you for your attention

Rheinmetall has the perfect suite of ammunition to successfully engage today's threats

Rheinmetall has the technologies to offer individually customized solutions

With Rheinmetall you are always one step ahead



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