ALWAYS**AHEAD**

OERLIKON AHEAD® AIR BURST AMMUNITION
ADVANCED HIT EFFICIENCY AND DESTRUCTION

TAKING RESPONSIBILITY IN A CHANGING WORLD

RHEINMETALL

INTRODUCTION

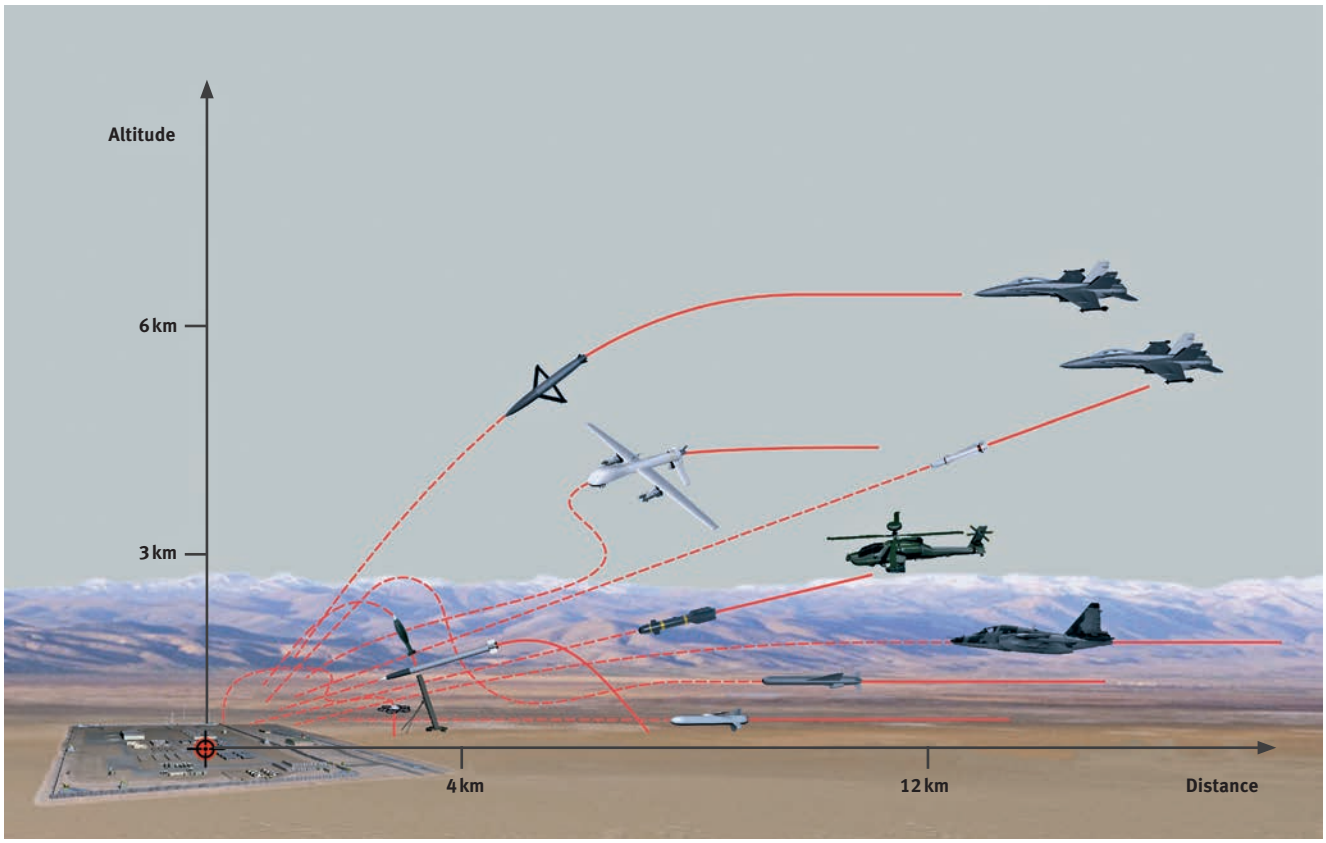
The Oerlikon Ahead® ammunition is able to defeat a wide range of current and emerging air threats, day or night and in all weather conditions.

It offers cannon based air defence systems an excellent chance to defeat fast, small and highly agile targets whilst staying effective against conventional air targets.
By increasing the effective range and hit probability, it acts as a force multiplier. The following most demanding modern aerial targets can successfully be engaged:

- Standoff missiles and munitions
- Cruise missiles
- Anti-ship missiles
- Mortar rounds
- Artillery rockets
- Loitering ammunition
- Battlefield UAS (ISR UAS, FPV UAS)
- Anti-radiation missiles
- Hypersonic missiles

The Oerlikon Ahead® ammunition is fully qualified and has been fielded by more than 12 armed forces. Its operating principle has been successfully implemented in two calibres (35 mm x 228 and 30 mm x 173) and numerous platforms. The Ahead ammunition family has evolved to include dedicated C-RAM, C-UAS and anti-missile ammunitions using optimized payload configurations.

The Ahead ammunition family is combat proven, fielded on land and at sea and is available today for new or already in service systems.



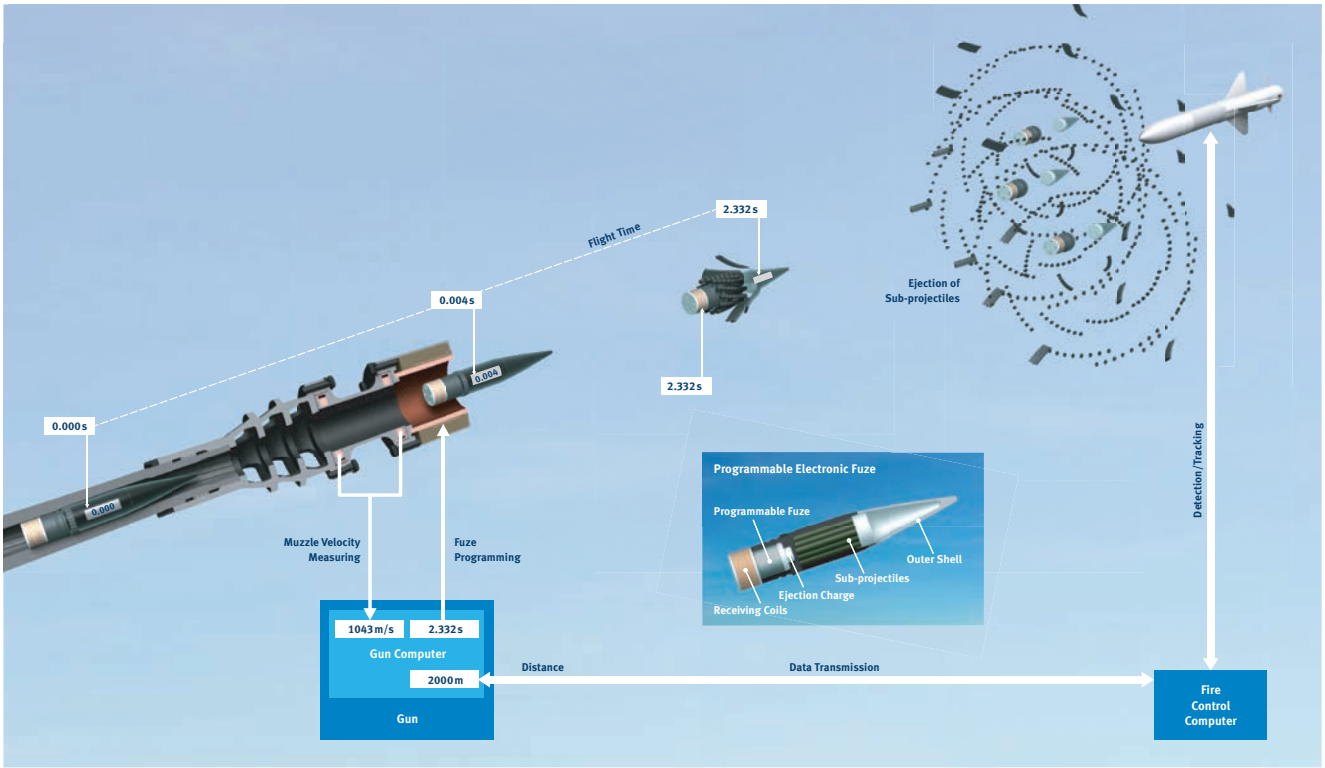
Modern air threats

CONCEPT

The Ahead principle uses a programmable time fuze in each round to eject its sub-projectile payload just ahead of the target. The programming of the time of flight for each round is performed inductively at the muzzle of the barrel using ballistic data from the fire control unit.

As the round leaves the muzzle its exact speed is measured just before programming using inductive coils. The muzzle velocity of each round is used to correct the ejection time that is programmed into the round. This compensation allows very accurate placement of the sub-projectiles in front of the target, forcing the target to fly into a cloud of tungsten sub-projectiles. The high number of sub-projectiles per round maximises the hit probability.

Ahead muzzle velocity measuring and programming base



Ahead principle

The high kinetic energy, the optimized shape and the hardness of the sub-projectiles offer excellent penetration performance in steel, aluminium or composite structures. The spin-stabilized sub-projectiles form a defined cone allowing repeatable and verifiable sub-projectile saturation levels to be reached for any chosen stand-off distance in front of the target. This allows detailed hit and kill performance prediction and optimisation.

The fine balance between hit and kill probability is a hallmark of the Ahead principle. The concept is unique, in that it allows fine tuning both values with regards to the target type and size. This is achieved by selecting the payload or the ejection distance (once a payload configuration has been decided upon).

CONFIGURATIONS

The baseline 35 mm x 228 Ahead round design can carry a 500 g tungsten sub-projectile payload. It can be delivered using a classic or hardened cartridge case with or without belt link groove.

The effective range is up to 4,500 m. The round incorporates numerous mechanical and digital safety features. The round is inherently safe with a very low explosive content (opening charge less than 1 g). No chemical battery is used. The round requires no special treatment or maintenance.

The 35 mm x 228 Ahead round can be fired by the KDC cannon, the KDG revolver cannon or the ATK Bushmaster III cannon. It is used on the Oerlikon Revolver Gun® family (Millennium Gun, Revolver Gun Mk2, Revolver Gun Mk3, Revolver Gun C-RAM, Skyranger) and the latest generations of the Oerlikon Twin Gun® family (GDF007/GDF009) as the standard ammunition. It can be retrofitted to any already in service Oerlikon Twin Gun®.

For the air defence role the following two configurations are offered:

Oerlikon 35 mm Ahead PMD062
- Designed to defeat a wide range of air targets with 152 sub-projectiles
- NATO stock number 1310-21-913-1531

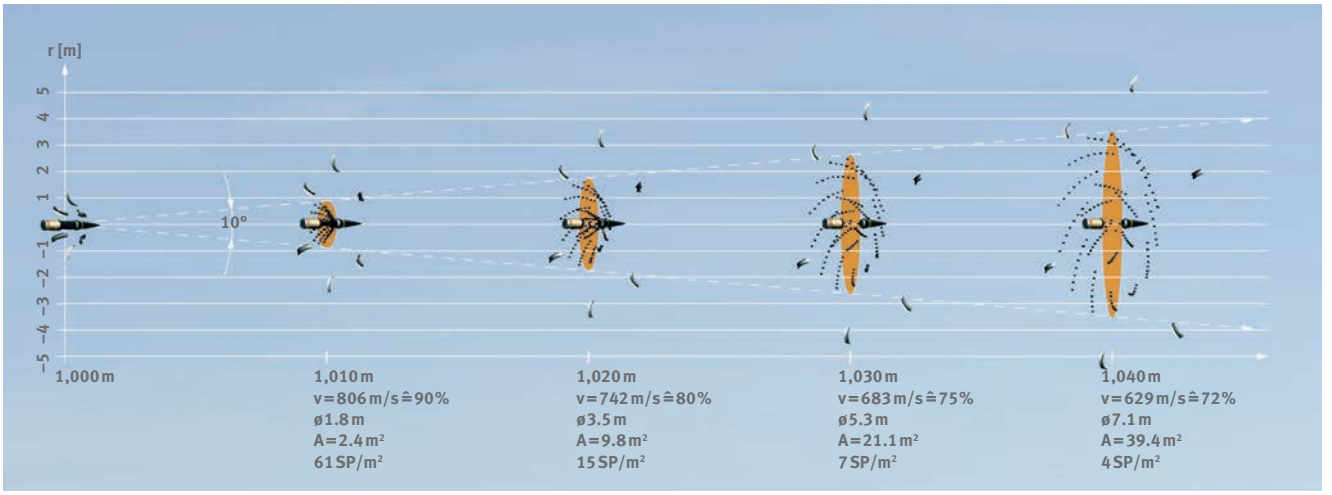
Oerlikon 35 mm KETF PMD428
- Optimized to defeat small, fast and agile targets (UAS, LSS) with more than 600 sub-projectiles

Depending on the nature of the expected threat, different sub-projectile sizes can be proposed. All rounds can also be fired without programming at the muzzle, and thus impacting as a complete projectile on the target releasing all sub-projectiles inside the target, so essentially becoming a frangible armour piercing (FAP) cartridge.

KEY CHARACTERISTICS

- High precision programmable base fuze
- Tungsten sub-projectile payload
- All payload kinetic energy is projected towards the target
- Spin-stabilized sub-projectiles
- Self-destruction incorporated
- Unprogrammed anti-armour mode
- Qualified and in service
- Inherently safe round
- Embedded advanced ECCM functionality
- No special maintenance needed
- Retrofit to existing 35 mm air defence systems possible
- More than 600,000 rounds delivered

SUB-PROJECTILE DISTRIBUTION AFTER EJECTION (PMD062)



PLATFORMS

35 mm x 228

30 mm x 173

Oerlikon Skyranger® 35

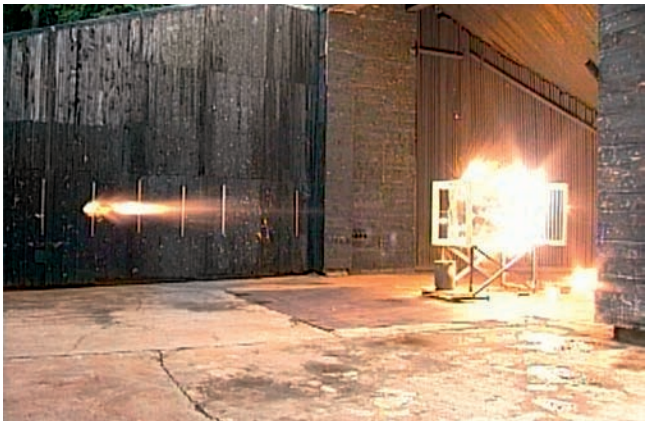
Oerlikon Revolver Gun® Mk3

Oerlikon Skyranger® 30

Oerlikon Twin Gun® GDF009 TREO

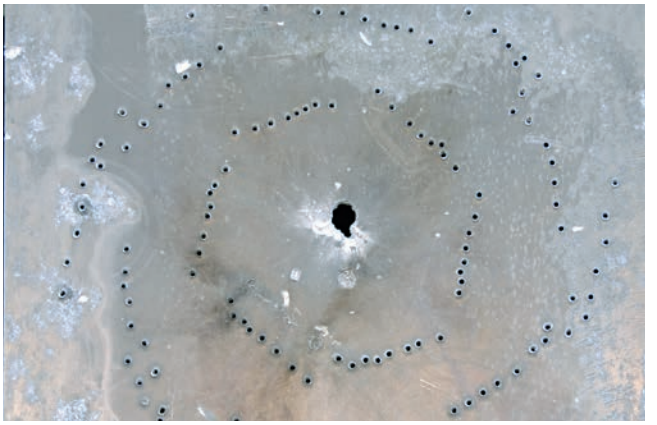
Oerlikon Millennium® Gun

FIRE POWER



Ejection of sub-projectiles in front of the target

Air-to-ground missile destroyed by one burst of Ahead ammunition



Pattern of one Ahead round, shot through a 20 mm aluminium plate

35 mm steel armour plate penetrated by an unprogrammed Ahead round (target angle 45°/target distance 500 m)

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