Nammo

AMMUNITION HANDBOOK

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WE ARE NAMMO

Nammo is an international aerospace and defense company headquartered in Norway. With over 2 700 employees across more than 34 sites and offices in 12 countries, we are one of the world's leading providers of ammunition and rocket motors for both military and civilian customers.

Nammo was formed in 1998 through a merger of ammunition businesses in Norway, Sweden and Finland, and today is owned equally by the Norwegian Ministry of Trade, Industry and Fisheries and the Finnish aerospace and defense company Patria Oyj.

Nammo manufactures superior quality ammunition for some of the world's most demanding customers, both military and civilian. Our product portfolio includes shoulder-launched munitions systems, ammunition for military applications, sports shooting and hunting, rocket motors for military and space applications, and environmentally friendly demilitarization services.

Defense accounts for 80 percent of our income, and 20 percent is from civilian activities including commercial ammunition, space propulsion and sea safety.

CORE BUSINESS

Ammunition

Nammo is a superior quality producer of small, medium and large caliber ammunition products.

Shoulder-Fired Systems

Nammo has a broad range of shoulder-fired systems covering most of the warfighters' needs in today's scenarios.

Rocket Motors

Nammo has unique competence within engineering, analysis and manufacturing of high-performance rocket motors and space applications.

Demilitarization

Nammo is a world leader within environmentally friendly demilitarization.

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SMALL CALIBER AMMUNITION

- Combat and training ammunition
- Premium cartridge technology
- Commercial brands ranging from 4.6 mm to 12.7 mm ammunition

MAKING NATO CALIBERS MORE EFFECTIVE AND SAFE

The basic principles of small arms ammunition have not changed for over a century, but that doesn't mean innovation has stopped. The industry is continuously exploring ways to evolve small caliber ammunition – such as 5.56 mm and 7.62 mm – including the use of new materials that improve performance, reduce cost and even address environmental concerns.

Photo: Norwegian Armed Forces / Henrik Røyne

Whether you are in the armed forces or are a military enthusiast, most people are familiar with 5.56 mm and 7.62 mm rifle and machine gun ammunition. These legendary rounds – standard across the NATO alliance and elsewhere – have been fired by soldiers in combat around the world for decades, most recently in regions such as Iraq and Afghanistan.

Despite some criticism of these calibers in recent years, as well as the introduction of future ammunition types such as the US Army's 6.8 mm intermediate round (designed for the Next Generation Squad Weapon), the 5.56 mm and 7.62 mm rounds will likely remain the preferred solutions for most NATO and other Western allied forces for the foreseeable future.

With this in mind, the industry continues to ensure that NATO-standard small arms ammunition remains effective and relevant in today's operating environments.

"Ammunition principles have been the same for 150 years, so what we are doing is tuning and improving," said Fredrik Erninge, Nammo's Product Director of Small Caliber Ammunition. "Over the last 10 years, we have been able to make our ammunition more efficient, cheaper and more environmentally friendly. "Making the ammunition more environmentally friendly is really a hot topic," he added.

Removing lead from bullets is seen as being particularly important, owing to its harmful environmental effects. Lead has traditionally been used for the projectile's core, while its outer "jacket" is made of a harder metal such as copper. This is often referred to as full metal jacket, or ball, ammunition.

Recognizing the effect on the environment and the soldiers that fire them, Nammo has been striving for two decades to remove lead from its products. "Due to customer requirements from the Scandinavian countries, we were very early in developing lead-free alternatives – but it's a topic that never ends," said Erninge.

This is especially true with the European Union's strict REACH regulations, which in 2018 identified lead as a substance of very high concern. Copper (and its harder alloy, brass) can also cause harm to the environment, and there are similar efforts to reduce the use of this as well.

In terms of effectiveness, Nammo has also expanded its range of armor piercing (AP) ammunition across its small caliber portfolio. The company utilizes materials such as tungsten carbide, a compound of tungsten and carbon, which is extremely hard and offers significant penetration capabilities against body armor and lightly armored vehicles. Nammo has supplied the US Army with AP 5.56 mm and 7.62 mm rounds since the 1990s.

Nammo is also looking into lightweight polymer materials that could replace brass cartridges, which are beneficial for the individual soldier in terms of lightening the load as well as logistically for transporting ammunition boxes. Nammo is now pursuing this technology further through its investment in MAC LLC.

4.6 mm x 30
PLASTIC BLANK AMMUNITION

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement communities with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +63°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	3 m
Shelf life	15 years

Status

Qualified for use in HK MP7 with Blank Firing Attachment.

5.56 mm x 45 AP 3

M995

Mission

Significantly increases the warfighter's lethality. Optimized projectile design with a tungsten carbide core for penetration of hard targets. Penetrates 12 mm rolled homogeneous armor 300 HB at 100 m and light body armor at normal combat distances.

Projectile weight	3.4 g (52 grain)
Muzzle velocity	1 030 m/s
Maximum dispersion	SD ← 200 mm at 550 m
Penetration	12 mm RHA at 0□ at 100 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

Type classified by US Army in 1996 as M995. Nammo has been the sole supplier since then. In service in several countries. Combat proven and in production.

5.56 mm x 45
AP 45

Mission

Incorporating Nammo's knowledge on tungsten carbide technology and lead free projectile design, the 5.56 mm AP 45 provides a cost-effective Armor Piercing (AP) round for use in assault rifles and machine guns. Military specified (STANAG 4172). The heavy projectile provides increased performance at long ranges.

Projectile weight	4.5 g (69 grain)
Muzzle velocity	900 m/s
Maximum dispersion	SD ← 200 mm at 550 m
Penetration	NATO plate at 900 m, 7 mm RHA at 200 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production.

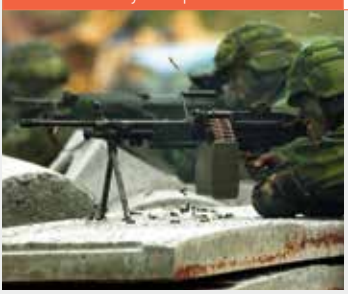
5.56 mm x 45 NATO BALL

M855

Mission

Standard ball round of M855 type. Can be delivered linked together with tracers, dim tracers or Armor Piercing rounds in any combination required to fit the specific need. Also available in battle packs like the M249 plastic magazine.

Projectile weight	4 g (62 grain)
Muzzle velocity	930 m/s
Maximum dispersion	SD ≤ 200 mm at 550 m
Penetration	3.5 mm NATO plate at 570 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C



Status

In production and NATO qualified as AC/225-127A.

5.56 mm x 45
BALL NON TOXIC 4 HP
Mk2

LEAD FREE

Mission

Second generation of the non toxic, lead free, high performance 5.56 mm cartridge. Optimized cartridge with flatter trajectory and enhanced effect in all targets.

Projectile weight	4 g (62 grain)
Muzzle velocity	930 m/s
Maximum dispersion	SD ≤ 200 mm at 550 m
Penetration	3.5 mm NATO plate at 700 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production. Qualified by Norwegian defense forces as NM255.

5.56 mm x 45
DIM TRACER (IR) 4
Mk301 Mod 0

Mission

The infrared (IR) tracer is totally invisible to the naked eye. It can only be seen with Night Vision Devices (NVDs), giving the user clear advantages as a stealth fighter at night. Instant ignition for short combat distances.

Projectile weight	3.9 g (60 grain)
Muzzle velocity	930 m/s
Maximum dispersion	SD ≤ 300 mm at 550 m
Tracer	13–600 m (typically visible to 950 m)
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

Type classified by US Army and United States Marine Corps (Mk301 Mod 0). In service with the US, Swedish, Norwegian and UK defense forces. Combat proven. Also available as a non toxic, lead free cartridge.

LEAD FREE

5.56 mm x 45 NATO TRACER

Mission

Standard tracer that supports the gunner during firing engagements with a distinct and clear trace, giving full trajectory control out to typically 800 m.

Projectile weight	4 g (62 grain)
Muzzle velocity	920 m/s
Maximum dispersion	SD ≤ 300 mm at 550 m
Tracer	140 m – ≥ 600 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production.

5.56 mm x 45
TRACER NON TOXIC 4

LEAD FREE

Mission

A non toxic, lead free tracer that supports the gunner during firing engagements. With a distinct and clear tracer, it gives full trajectory control out to typically 800 m. Also available as a direct ignition tracer suitable for Military Operations on Urbanized Terrain with short combat distances.

Projectile weight	3.9 g (60 grain)
Muzzle velocity	920 m/s
Maximum dispersion	SD ≤ 300 mm at 550 m
Tracer	140 m – ≥ 600 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production and in service with Swedish and Norwegian defense forces.

5.56 mm x 45
FRANGIBLE NON TOXIC 4 SEMI-JACKETED

LEAD FREE

Mission

Ammunition that fragments upon impact with hard targets. Perfect for Close Quarter Battle training or other situations in which you want to avoid ricochets and splash-back. The ammunition is military specified and meets all applicable NATO STANAG requirements.
Optimal for use in carbines. They are 100 percent lead free to reduce impact on the environment and ensure a user environment free from lead vapors.

Projectile weight	4.0 g (62 grain)
Projectile design	Copper-polymer matrix core, semi-jacketed
Muzzle velocity	900 m/s
Maximum dispersion	SD ← 25 mm at 100 m
Service temperature	-32°C to +52°C

Status

In production.

5.56 mm x 45
PLASTIC BLANK AMMUNITION

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement communities with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +40°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	3 m
Shelf life	15 years

Status

Qualified for use in Colt M16/M4, C7/C8, FN Minimi, HK G36 family, HK 416 N/K and Steyr Aug. Nammo provides a Blank Firing Attachment for HK 416 N/K.

5.56 mm x 45 PSRTA

M862 A1

Mission

Plastic Short Range Training Ammunition (PSRTA) is intended for use in training areas where range restrictions preclude the use of full range standard service ammunition. The cartridges provide the ability to increase the frequency of carrying out realistic training scenarios, even on restricted ranges, in built-up areas and at shooting houses, therefore enhancing the proficiency of the user.

Projectile weight	0.3 g (5 grain)
Service temperature	Operational temperature -30°C to +63°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	200 m
Shelf life	15 years

Status

The ammunition is qualified to be used in Colt M16/M4, C7/C8, FN Minimi, HK G36 family, HK 416 N/K, SIG 550/551, SIG 552 family, and Steyr AUG.

7.62 mm x 51 NATO BALL

Mission

NATO qualified standard ball round of M80 type. Can be delivered linked together with tracers, dim tracers or Armor Piercing rounds in any combination required to fit the specific need.

Projectile weight	9.45 g (146 grain)
Muzzle velocity	810 m/s
Maximum dispersion	SD ≤ 200 mm at 550 m
Penetration	3.5 mm NATO plate at 550 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production and NATO qualified as AC/116-29A. First Article approved by US Government.

7.62 mm x 51
BALL 11 LONG RANGE

Mission

Military specified (STANAG 2310) cartridge with a full metal jacket projectile providing excellent accuracy at long ranges.
Suitable for semi-automatic rifles (DMR), sniper rifles and machine guns. The high projectile weight increases the impact energy by 40 percent at 800 m compared to a standard ball (M80).

Projectile weight	10.9 g (168 grain)
Muzzle velocity	805 m/s
Maximum dispersion	≤ 1 MOA
Penetration	3.5 mm NATO plate at 550 m
Powder	Temperature stable
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

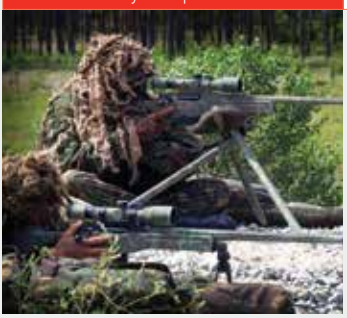
In production. Qualified by Norwegian defense forces as NM258.

7.62 mm x 51
AP 11 LONG RANGE

Mission

Combining Nammo's long-range technology with world-leading tungsten carbide Armor Piercing (AP) technology, this cartridge provides superior penetration capabilities, as well as excellent accuracy at long ranges. This is a military specified (STANAG 2310) cartridge with a full metal jacket projectile that is suitable for semi-automatic rifles (DMR), sniper rifles and machine guns.

Projectile weight	10.9 g (168 grain)
Muzzle velocity	805 m/s
Maximum dispersion	≤ 1.5 MOA
Penetration	18 mm RHA at 80 m, 7 mm RHA at 600 m 3.5 mm NATO plate at 1 100 m
Powder	Temperature stable
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C



Status

In production.

7.62 mm x 51
AP 10

Mission

Utilizing Nammo's knowledge of tungsten carbide technology and lead free projectile design, the 7.62 Armor Piercing (AP) 10 provides a cost-effective round for use in assault rifles and machine guns. Military specified (STANAG 2310). The heavy projectile gives increased performance at long ranges.

Projectile weight	9.85 g (152 grain)
Muzzle velocity	845 m/s
Maximum dispersion	SD ≤ 200 mm at 550 m
Penetration	7 mm RHA at 300 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production.

7.62 mm x 51
AP 8
M993

Mission

Significantly increases the warfighter's lethality. Optimized projectile design with a tungsten carbide core for penetration of hard targets. Penetrates 18 mm rolled homogeneous armor 300 HB at 100 m and heavy body armor at normal combat distances.

Projectile weight	8.3 g (128 grain)
Muzzle velocity	930 m/s
Maximum dispersion	SD ≤ 200 mm at 550 m
Penetration	18 mm RHA at 100 m, 7 mm RHA at 500 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

Type classified by US Army in 1996 as M993. Nammo has been the sole supplier. In service in several countries. Combat proven and in production. Also available as a non toxic, lead free round.

LEAD FREE

7.62 mm x 51
BALL NON TOXIC 9 HP

LEAD FREE

Mission

The cartridge has an improved performance compared to the standard NATO Ball and is 100 percent lead free. Exists in all three NATO calibers – both as ball and tracer.

Projectile weight	9 g (139 grain)
Muzzle velocity	860 m/s
Maximum dispersion	SD ≤ 150 mm at 550 m
Penetration	3.5 mm NATO plate at 900 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

The world's only NATO qualified 7.62 mm "green" ball round totally free from lead. In service with Swedish and Norwegian defense forces. Combat proven and NATO qualified as AC/116-32A.

7.62 mm x 51 NATO TRACER

Mission

Standard tracer that supports the gunner during firing engagements with a distinct and clear tracer, giving full trajectory control out to typically 900 m.

Projectile weight	9 g (139 grain)
Muzzle velocity	820 m/s
Maximum dispersion	SD ≤ 300 mm at 550 m
Penetration	140 m – ≥ 775 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production and NATO qualified as AC/116-30A.

7.62 mm x 51
TRACER NON TOXIC 9

LEAD FREE

Mission

A non toxic, lead free tracer that supports the gunner during firing engagements with a distinct and clear tracer, giving full trajectory control out to typically 900 m. Also available as direct ignition tracer suitable for Military Operations on Urbanized Terrain with short combat distances.

Projectile weight	8.7 g (134 grain)
Muzzle velocity	850 m/s
Maximum dispersion	SD ≤ 250 mm at 550 m
Tracer	140 m – ≥ 775 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

The world's only NATO qualified "green" tracer round totally free from lead. In service with Swedish and Norwegian defense forces. Combat proven and NATO qualified as AC/116-37A.

7.62 mm x 51
DIM TRACER (IR) 9

Mission

The infrared (IR) tracer is totally invisible to the naked eye. It can only be seen with Night Vision Devices (NVDs), giving the user clear advantages as a stealth fighter at night. Instant ignition for short combat distances.

Projectile weight	9 g (139 grain)
Muzzle velocity	840 m/s
Maximum dispersion	SD ≤ 300 mm at 550 m
Tracer	13–775 m (typically visible to 1 250 m)
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +71°C

Status

In service with Swedish, Norwegian and UK defense forces. Combat proven. Also available as a non toxic, lead free cartridge.

LEAD FREE

7.62 mm x 51
BALL NON TOXIC 6 RR

LEAD FREE

Mission

Lead free cartridge that has the same performance as NATO Ball up to a distance of 200 m, but with a safety fan of a maximum 1 500 m (compared to 4 300 m for a NATO Ball). For use in populated, sensitive areas and in the protection of airports, harbors, embassies and dangerous goods transportation vehicles. An excellent cartridge for training on small ranges, restricted areas and moving platforms, for example RWS.

Projectile weight	6.2 g (96 grain)
Muzzle velocity	880 m/s
Maximum dispersion	SD ≤ 30 mm at 100 m
Trajectory	Matches NATO Ball up to 200 m
Service temperature	-20°C to +52°C
Safety temperature	-54°C to +71°C

Status

In production.

7.62 mm x 51
FRANGIBLE NON TOXIC 9 OPEN TIP

LEAD FREE

Mission

Ammunition that fragments upon impact with hard targets. Perfect for Close Quarter Battle training or other situations in which you want to avoid ricochets and splash-back. The ammunition is military specified and meets all applicable NATO STANAG requirements. Optimal for use in carbines and DMRs. It is 100 percent lead free to reduce impact on the environment and ensure a user environment free from lead vapors.

Projectile weight	9.1 g (140 grain)
Projectile design	Copper-tin matrix core, jacketed open tip
Muzzle velocity	815 m/s
Maximum dispersion	SD ← 25 mm at 100 m
Service temperature	-40°C to +52°C

Status

In production.

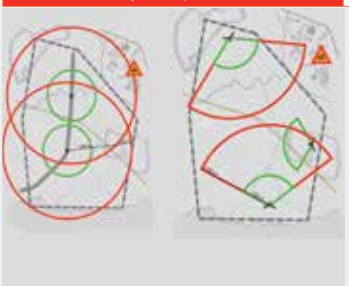
7.62 mm x 51
TRACER NON TOXIC 6 RR

LEAD FREE

Mission

A lead free cartridge that has the same performance as NATO Tracer up to a distance of 200 m, but with a safety fan of a maximum 1 500 m (compared to 4 300 m for a NATO Ball). For use in populated, sensitive areas. An excellent cartridge for training in small ranges, restricted areas and from moving platforms, for example RWS. Preferably linked together with 7.62 Ball Non Toxic 6 Reduced Range (RR) for use in machine guns.

Projectile weight	5.9 g (91 grain)
Muzzle velocity	880 m/s
Maximum dispersion	SD ≤ 45 mm at 100 m
Trajectory	Matches NATO Ball up to 200 m
Tracer	40 m - ≥ 200 m
Service temperature	-20°C to +52°C
Safety temperature	-54°C to +71°C



Status

In production.

7.62 mm x 51
PLASTIC BLANK AMMUNITION

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement communities with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +40°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	3 m
Shelf life	15 years

Status

The ammunition exists in two different lengths, both qualified for use in Sniper Bolt Rifles, HK G3, MG 3, FN MAG and FN Minimi. Nammo also provides Blank Firing Attachments and Cartridge Discriminator.

7.62 mm x 51 PSRTA

Mission

Plastic Short Range Training Ammunition (PSRTA) is intended for use in training areas where range restrictions preclude the use of full range standard service ammunition. The cartridges provide the ability to increase the frequency of carrying out realistic training scenarios, even on restricted ranges, in built-up areas and at shooting houses, therefore enhancing the proficiency of the user.

Projectile weight	0.7 g (11 grain)
Service temperature	Operational temperature -30°C to +40°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	200 m
Shelf life	15 years

Status

Nammo supplies Firing Attachment and Practice Bolt for HK G3, as well as Firing Attachment for MG 3.

7.62 mm x 35 (300 BLK) FRANGIBLE 7 OPEN TIP

Mission

This ammunition fragments upon impact with hard targets. It is perfect for Close Quarter Battle training or other situations where it's desirable to avoid ricochets and splash-back. The ammunition is military specified and meets all applicable NATO STANAG requirements.

Projectile weight	7.1 g (110 gr)
Projectile design	Copper-tin matrix core, jacketed open tip
Muzzle velocity	690 m/s
Maximum dispersion	SD ← 25 mm at 100 m
Service temperature	-40°C to +52°C

Status

In production.

7.62 mm x 35 (300 BLK)
BALL 13 SUBSONIC SPECIAL PURPOSE

Mission

Ammunition for stealth operations.
The high mass projectile ensures reliable function in automatic weapons and good terminal effects. Optimized for function in weapons with short barrels and sound suppressors.

Projectile weight	12.6 g (194 gr)
Projectile design	Copper/aluminum core, jacketed open tip
Muzzle velocity	290 m/s
Maximum dispersion	D100 ← 90 mm at 50 m (avg. of 3x5 rounds)
Service temperature	-40°C to +52°C

Status

In production.

7.62 mm x 51
.308 WINCHESTER D46

Mission

Often copied, never equaled. The legendary D46 in caliber 7.62 is the product by which all others of its type are measured. Manufactured to the strictest tolerances for concentricity, uniformity of shape and weight, it has been shooting its way into the record books since the 1930s.

Projectile weight	12.0 g (185 grain)
Projectile type	D46 (FMJBT)
Muzzle velocity	760 m/s (2 490 fps)
Accuracy at 300 m (10 rds)	≤ 85 mm

Status

In production for over 80 years and still used by professionals.

7.62 mm x 51
.308 WINCHESTER LOCK BASE

Mission

Unbeatable accuracy over extra long distances. The Lock Base tail structure also provides exceptional precision at high pressures and high muzzle velocities. The full metal jacket boat tail configuration reduces drag and provides a flatter trajectory.

Projectile weight	11.0 g (170 grain)
Projectile type	B476 (FMJBT)
Muzzle velocity	840 m/s (2 756 fps)
Accuracy at 300 m (10 rds)	← 95 mm

Status

B476 is regular service ammunition for several Armed Forces.

7.62 mm x 51
.308 WINCHESTER SEMI-AUTO

Mission

The .308 Winchester FMJBT semi-auto cartridge is designed for optimal ballistic performance in shorter barrels (12–20 inches). This tactical cartridge works flawlessly with DMR-type semi-auto rifles.

Projectile weight	11.0 g (170 grain)
Projectile type	B476 (FMJBT)
Muzzle velocity	744 m/s (2 440 fps)
Accuracy at 300 m (10 rds)	← 87 mm average

Status

In production.

7.62 mm x 51
.308 WINCHESTER SCENAR

Mission

Scenar is an extremely accurate Open-Tip Match (OTM) bullet. A boat tail base gives an outstanding ballistic coefficient. Nammo's Scenar projectiles deliver superb results at long ranges.

Projectile weight	10.0 g (155 grain), 11.3 g (175 grain), 10.85 g (167 grain), 12.0 g (185 grain)
Projectile type	GB552 (OTM), GB550 (OTM), GB422 (OTM), GB432 (OTM)
Muzzle velocity	860 m/s (2 820 fps), 793 m/s (2 602 fps), 820 m/s (2 690 fps), 755 m/s (2 475 fps)
Accuracy at 300 m (10 rds)	← 85 mm average, ← 70 mm average, ← 70 mm average, ← 70 mm average

Status

Used by multiple Special Forces around the world.

7.62 mm x 51
.308 WINCHESTER AP

Mission

Lapua®'s Armor Piercing (AP) is the most accurate AP ammunition that is manufactured using proven match grade technology. It provides excellent penetration against extra hard targets.

Projectile weight	10.7 g (165 grain)
Projectile type	AP492
Muzzle velocity	860 m/s (2 820 fps)
Penetration	→ 15 mm at 100 m. Steel plate 400 HB
Accuracy at 300 m (10 rds)	≤ 120 mm

Status

Used by several Armed Forces and police forces needing extreme penetrating power and accuracy. Extra hard tungsten carbide based penetrator.

7.62 mm x 51
.308 WINCHESTER SUBSONIC

Mission

This ammunition is the most widely used 7.62 mm caliber subsonic ammunition for military and law enforcement special operations. Designed specifically for specialized short barrel tactical rifles that have sound suppressors.

Projectile weight	13.0 g (200 grain)
Projectile type	B416 (FMJBT)
Muzzle velocity	325 m/s (1 066 fps)
Accuracy at 100 m (10 rds)	≤ 60 mm
Barrel length	300–450 mm/12–17 inches
Twist	200–250 mm/8–10 inches

Status

Most sold and most accurate factory subsonic ammunition in this caliber.

8.6 mm x 70
.338 LAPUA® MAGNUM LOCK BASE

Mission

Unbeatable accuracy over extra long distances. The Lock Base tail structure also provides exceptional precision at high pressures and high muzzle velocities. The full metal jacket boat tail configuration reduces drag and provides a flatter trajectory.

Projectile weight	16.2 g (250 grain)
Projectile type	B408 (FMJBT)
Muzzle velocity	900 m/s (2 953 fps)
Accuracy at 300 m (5 rds)	95 mm

Status

Service ammunition of several Armed Forces.
In operation since 1998.

8.6 mm x 70
.338 LAPUA® MAGNUM SCENAR

Mission

Scenar is an extremely accurate Open-Tip Match (OTM) bullet. A boat tail base delivers an outstanding ballistic coefficient. Lapua® Scenar bullets deliver superb results at long ranges.

Projectile weight	16.2 g (250 grain)	19.4 g (300 grain)
Projectile type	GB488 (OTM)	GB528 (OTM)
Muzzle velocity	905 m/s (2 970 fps)	820 m/s (2 690 fps)
Accuracy at 300 m (5 rds)	← 85 mm average	← 85 mm average

Status

Used by multiple Special Forces around the world.

8.6 mm x 70
.338 LAPUA® MAGNUM SOLID

Mission

Bullet construction with valve design provides maximum shock effect over a wide terminal velocity range (500–1 000 m/s). For operational purposes, the solid frame construction enables a straight bullet path through laminated glass without fragmentation.

Projectile weight	15.0 g (231 grain)
Muzzle velocity	920 m/s (3 018 fps)
Accuracy at 100 m (5 rds)	← 50 mm average

Status

Used for glass penetration.

8.6 mm x 70
.338 LAPUA® MAGNUM AP

Mission

Lapua®'s Armor Piercing (AP) is the most accurate AP ammunition that is manufactured using proven match grade technology. It provides excellent penetration against extra hard targets.

Projectile weight	16.1 g (248 grain)	19.4 g (300 grain)
Projectile type	AP485	AP529
Muzzle velocity	905 m/s (2 970 fps)	830 m/s (2 723 fps)
Penetration	→ 12 mm at 550 m Steel plate 400 HB	→ 12 mm at 600 m Steel plate 500 HB
Accuracy at 300 m (5 rds)	← 120 mm average	← 120 mm average

Status

Used by several Armed Forces needing extreme penetrating power and accuracy. Extra hard tungsten carbide based penetrator of special design.

8.6 mm x 70
.338 LAPUA® API

Mission

Designed to be used against vehicles and structures in situations when excellent penetration, incendiary and point of impact indication are required. The Armor Piercing Incendiary (API) bullet is designed to meet current insensitive munitions standards. Classified as 1.4S.

Projectile weight	16.4 g (253 grain)
Projectile type	API526
Muzzle velocity	895 m/s (2 935 fps)
Penetration	→ 10 mm at 500 m Steel plate 400 HB
Accuracy at 300 m (5 rds)	← 130 mm
Special characteristics	Observable flash at hard targets. Ignition of vaporized fuel.

Status

Latest development in this caliber used by top professionals.

8.6 mm x 70
.338 LAPUA® MAGNUM PROOF, DRILL AND BLANK

Mission

High Pressure Proof, Drill and Blank cartridges complete the .338 Lapua® Magnum family.

Status

Produced on request.

9 mm x 19
BALL 7 HP

Mission

Optimized to penetrate body armor. Penetrates more than 50 layers of Para-Aramide at 6 m or 3 mm steel at 75 m. Suitable for Special Forces or police units using weapons like Glock, MP-9 and HK MP5.

Projectile weight	6.75 g (104 grain)
Muzzle velocity	450 m/s
Maximum dispersion	SD ← 50 mm at 46 m
Penetration	3 mm mild steel at 75 m 50 layers of Para-Aramide at 6 m
Service temperature	-54°C to +52°C

Status

In service with several forces.
Combat proven.

9 mm x 19
BALL NON TOXIC 7 HP

LEAD FREE

Mission

A 100 percent lead free High Performance (HP) cartridge that can penetrate more than 50 layers of Para-Aramide at 6 m or 3 mm steel at 75 m. Suitable for Special Forces or police units using weapons like Glock, MP-9 and HK MP5.

Projectile weight	7.1 g (110 grain)
Muzzle velocity	410 m/s
Maximum dispersion	SD ← 50 mm at 46 m
Penetration	3 mm mild steel at 75 m 50 layers of Para-Aramide at 6 m
Service temperature	-54°C to +52°C

Status

World's only NATO qualified 9 mm "green" round totally free from lead. In service with several forces. Combat proven and NATO qualified as AC/116-XVIA.

9 mm x 19
FRANGIBLE NON TOXIC 6

LEAD FREE

Mission

Ammunition that fragments upon impact with hard targets. Perfect for Close Quarter Battle training or other situations in which you want to avoid ricochets and splash-back. The ammunition is military specified and meets all applicable NATO STANAG requirements. Optimal for use in pistols and submachine guns. It is 100 percent lead free to reduce impact on the environment and ensure a user environment free from lead vapors.

Projectile weight	6.5 g (100 grain)
Projectile design	Sintered copper-tin
Muzzle velocity	410 m/s
Maximum dispersion	SD ← 50 mm at 46 m
Service temperature	-32°C to +52°C

Status

In production.

12.7 mm x 99 BALL (.50 CAL)

Mission

Standard .50 caliber ball round for general purpose use in machine guns, which can be linked together with or without tracer rounds.

Projectile weight	42 g
Velocity V_{24}	903 m/s
Maximum dispersion at 550 m	SD ≤ 300 mm
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified for use in Browning M2HB, M2 QCB, M2 Flex & Turret, M2 Manroy QCB, M2 CIS-50 and M3A3. First Article approved by US Government. Equivalent to M33.

12.7 mm x 99 TRACER (.50 CAL)

Mission

Standard .50 caliber tracer round, ballistically matched to the standard ball rounds, for use in machine guns, which can be linked together with ball rounds.

Projectile weight	40 g
Velocity V_{24}	903 m/s
Maximum dispersion at 550 m	SD ≤ 400 mm
Tracer	1 500 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified for use in Browning M2HB, M2 QCB, M2 Flex & Turret, M2 Manroy QCB and M2 CIS-50. Equivalent to M17.

12.7 mm x 99
SG BALL (.50 CAL)
NM241 Grade A (Match Grade) and Grade B (Linked)

Mission

Ball round for use against soft targets with extreme accuracy at long ranges.

Projectile weight	46 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 150 mm Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 70–100 mm
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

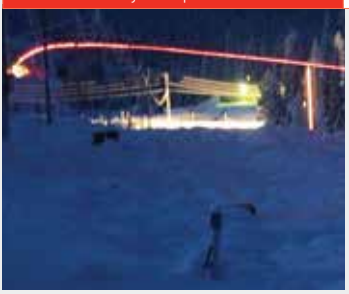
Qualified in Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
SG-T BALL TRACER (.50 CAL)
NM242 Grade A (Match Grade) and Grade B (Linked)

Mission

Ball round with tracer for use against soft targets with extreme accuracy at long ranges. The tracer ignites before 200 m and burns out to a minimum of 1 500 m.

Projectile weight	43 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 200 mm Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100–150 mm
Tracer	Visible ← 200 m to ≥ 1 500 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C



Status

Qualified in Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
SG-M (.50 CAL)
Grade A (Match Grade) and Grade B (Linked)

Mission

Ball round with marker/spotter function, extreme accuracy at long ranges. Upon impact the round will produce a marker flash, making it easy to spot.

Projectile weight	43 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 150 mm Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 70-100 mm
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
SG-DT (IR) (.50 CAL)
NM260 Grade A (Match Grade) and Grade B (Linked)

Mission

Ball round with tracer for use against soft targets with extreme accuracy at long ranges. The infrared (IR) tracer is only visible with Night Vision Equipment and completely invisible to the naked eye. The IR tracer burns for more than 1 000 m, making the gunner position untraceable as well as not lighting up the surroundings as with conventional tracers. This makes it the ideal round for night operations.

Projectile weight	43 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 200 mm Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100-150 mm
Penetration	N/A
Tracer	Infrared, visible with NVG ≤ 200 m, ≥ 1 000 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster.50 and Steyr .50. Combat proven.

12.7 mm x 99 API (.50 CAL)

Mission

Armor Piercing Incendiary (API) round for machine gun use. The hard steel core together with the incendiary composition provide excellent performance against material/light armor targets.

Projectile weight	42 g
Velocity V_{24}	903 m/s
Maximum dispersion at 550 m	SD ≤ 300 mm
Penetration	22 mm (321–375 HB) at 100 m
Tracer	N/A
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified for use in Browning M2HB, M2 QCB, M2 Flex & Turret, M2 CIS-50 and M3A3. First Article approved by US Government. Equivalent to M8.

12.7 mm x 99
API-T (.50 CAL)

Mission

Tracer round ballistically matched to the Armor Piercing Incendiary (API) round, for use in machine guns, which can be linked together with the API rounds.

Projectile weight	40 g
Velocity V_{24}	903 m/s
Maximum dispersion at 550 m	SD ≤ 400 mm
Penetration	22 mm (321–375 HB) at 100 m
Tracer	Visible from 200 m to 1 500 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified for use in Browning M2HB, M2 QCB, M2 Flex & Turret, M2 Manroy QCB and M2 CIS-50. Equivalent to M20.

12.7 mm x 99 AP-S (.50 CAL)

NM185 Grade A (Match Grade) and Grade B (Linked)

Mission

Armor Piercing (AP) round for extreme accuracy and high penetration capability against material targets. A large tungsten carbide penetrator provides excellent armor penetration (22 mm armored steel at 700 m). Targets range from light material to light armored vehicles.

Projectile weight	47 g
Velocity V_{24}	893 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 150 mm Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 70–100 mm
Penetration requirement	22 mm RHA at 100 m
Penetration capability	22 mm RHA at 700 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. More than 15 user countries in different applications. Combat proven.

12.7 mm x 99
API-S (.50 CAL)
NM173 Grade A (Match Grade) and Grade B (Linked)

Mission

Armor Piercing (AP) round for extreme accuracy and high penetration capability against material targets. A large tungsten carbide penetrator provides excellent armor penetration (22 mm armored steel at 700 m) with an incendiary/marker effect for spotting purposes. Targets range from light material to light armored vehicles.

Projectile weight	47 g
Velocity V_{24}	893 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 150 mm Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 70–100 mm
Penetration requirement	22 mm RHA at 100 m
Penetration capability	22 mm RHA at 700 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. More than 15 user countries in different applications. Combat proven.

12.7 mm x 99 MP (.50 CAL)

NM140F3 Grade A (Match Grade) and Grade B (Linked)

Mission

The new and improved Multipurpose F3 version gives better penetration, fragment pattern, accuracy and improved safety. It has enhanced penetration capability and fulfills STANAG AP requirements. The round has more fragments than the old version and, with a temperature stable propellant from extreme -54°C (-62°F) up to +71°C (161°F), it has excellent ballistic performance.

Projectile weight	43 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 150 mm Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 40–60 mm
Penetration requirement	22 mm RHA at 100 m
Penetration capability	10.6 mm steel 321–375 HB at 30° at 1 000 m
Tracer	N/A
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillanTAC-50,Rangemaster.50 and Steyr .50. More than 15 user countries in different applications. Combat proven.

12.7 mm x 99
MP-T (.50 CAL)

NM160F3 Grade A (Match Grade) and Grade B (Linked)

Mission

The new and improved Multipurpose-Trace F3 version gives better penetration, fragment pattern, accuracy and improved safety. It has enhanced penetration and fulfills full STANAG AP requirements. The round has more fragments than the old version and, with a temperature stable propellant from -54°C (-62°F) up to +71°C (+161°F), it has excellent ballistic performance. The tracer has a dark zone from 50–200 m and burnout to a minimum of 1 500 m.

Projectile weight	44 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 200 mm Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100–120 mm
Penetration requirement	22 mm RHA at 100 m
Penetration capability	10.6 mm steel 321–375 HB at 30° at 1 000 m
Tracer	Visible ← 200 m to ≥ 1 500 m
Service temperature	-54°C to +71°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
MP-DT (IR) (.50 CAL)
Grade A (Match Grade) and Grade B (Linked)

Mission

The Multipurpose round with an infrared (IR) tracer is for use against material targets. The high explosive, together with a tungsten carbide penetration and incendiary composition, give blast, fragmentation and incendiary effects, as well as excellent armor penetration capabilities and extreme accuracy at long ranges. The IR tracer burns for more than 1 000 m, making the gunner position untraceable as well as not lighting up the surroundings as conventional tracers. This makes the round ideal for night operations.

Projectile weight	44 g
Velocity V_{24}	903 m/s
Requirement maximum dispersion at 550 m	Grade A SD ≤ 200 mm Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100–120 mm
Penetration requirement	22 mm RHA at 100 m
Penetration capability	10.6 mm steel 321–375 HB at 30° at 1 000 m
Tracer	Visible ← 200 m to ≥ 1 000 m
Service temperature	-54°C to +52°C
Safety temperature	-54°C to +63°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

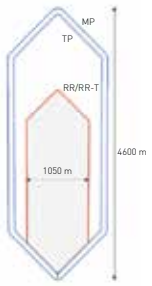
12.7 mm x 99 RR (.50 CAL)

NM243 Grade A (Match Grade) and Grade B (Linked)

Mission

Reduced range ball round with enhanced accuracy for use in both a training and an operational environment. Ballistics match standard ball round out to 800 m. Maximum Ricochet Range 2 630 m.

Projectile weight	43 g
Velocity V_{24}	940 m/s
Requirement maximum dispersion at 550 m	Grade A/Grade B SD ≤ 300 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 70–100 mm
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C



Status

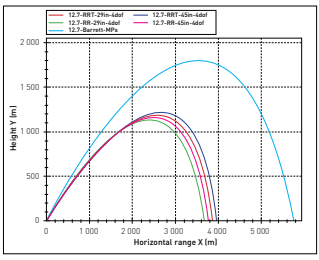
Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
RR-T (.50 CAL)
NM244 Grade A (Match Grade) and Grade B (Linked)

Mission

Reduced range ball round with enhanced accuracy for use in both a training and an operational environment. Ballistics match standard ball round out to 800 m. Maximum Ricochet Range 2 780 m. The tracer has a 50 m dark zone, which prevents gunner blindness and traceability from the target area. The tracer burns for more than 1 000 m, making it ideal for night operations.

Projectile weight	38 g
Velocity V_{24}	940 m/s
Requirement maximum dispersion at 550 m	Grade A/Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100–150 mm
Tracer	Visible ← 200 m to ≥ 1 000 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C



Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
RR-DT (IR) (.50 CAL)
Grade A (Match Grade) and Grade B (Linked)

Mission

Reduced range ball round with enhanced accuracy for use in both training and operational environments. Ballistics match with standard ball round out to 800 m. Maximum Ricochet Range 2 780 m. The infrared (IR) tracer is only visible with Night Vision Equipment and completely invisible to the naked eye. The infrared tracer burns for more than 1 000 m, making the gunner position not traceable as well as not lighting up the surroundings as conventional tracers. This makes the round ideal for night operations.

Projectile weight	38 g
Velocity V_{24}	940 m/s
Requirement maximum dispersion at 550 m	Grade A/Grade B SD ≤ 400 mm
Capability maximum dispersion at 550 m	Grade A SD ≤ 100–150 mm
Tracer	Visible ← 200 m to ≥ 1 000 m
Service temperature	-54°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Browning M2HB, M2 QCB, M2 NM218, FNH M3M & M3P, CIS-50, Barrett M82, Barrett M107, AI AW-50, AI AX-50, AS-50, HECATE PGM, McMillan TAC-50, Rangemaster .50 and Steyr .50. Combat proven.

12.7 mm x 99
POLYMER CASED AMMUNITION (.50 CAL) (MAC)

Mission

Nammo has introduced the fully compliant MIL-DTL-10190F .50 caliber polymer ammunition. Reduces weight by up to 30 percent, depending on configuration.

Status

Qualified, fielded and in current use by the US military.

Any .50 cal projectile

- Ball
- Tracer
- API
- API-T
- Multipurpose
- Reduced range

12.7 mm x 99
PLASTIC BLANK AMMUNITION (.50 CAL)

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement communities with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +40°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	5 m
Shelf life	15 years

Status

Ammunition for use in cal .50 M2 and QCB weapons. Nammo has developed a plastic link and adapted the cartridge thus reducing the wear and tear of the feeding system. Nammo delivers Recoil Amplifiers, Blank Firing Attachment and cartridge discriminator.

12.7 mm x 99
PSRTA-T (.50 CAL)

Mission

Plastic Short Range Training Ammunition with Tracer (PSRTA-T) is intended for use in training areas where range restrictions preclude the use of full range standard service ammunition. The cartridges provide the ability to increase the frequency of carrying out realistic training scenarios, even on restricted ranges, in built-up areas and at shooting houses, therefore enhancing the proficiency of the user. The cartridges offer an operational temperature range of -30°C to +40°C.

Projectile weight	3.4 g ball, 4.3 g tracer
Service temperature	Operational temperature -30°C to +40°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	700 m
Shelf life	15 years

Status

For use with Firing Attachment supplied by Nammo. Lethal within training distance.
In service.

DRILL ROUNDS
SMALL ARMS AMMUNITION

Premium quality drill rounds – for professional training

- Weight and center of gravity equal to standard ball cartridges
- Made of nickel-plated brass (minimum weapon fatigue)
- Highest training functionality

Cartridge data	Weight	Inch-pound	Dimensions
4.6 x 30 mm	8.5 g	131 grains	Standard
5.56 x 45 mm	14.3 g	220 grains	STANAG 4172
7.62 x 39 mm	25.4 g	391 grains	Standard
7.62 x 51 mm	25.7 g	395 grains	STANAG 2310
9 x 19 mm	11.0 g	169 grains	STANAG 4090
12.7 x 99 mm	113.0 g	1 744 grains	STANAG 4383

Packaging and Marking

In accordance with customer requirements.

MEDIUM CALIBER AMMUNITION

- Combat and training ammunition for army, navy and air force applications
- Programmable ammunition technology
- Technologies including Armor Piercing, Dim Trace, Lead Free, Multipurpose and Plastic Training

BURSTING ONTO THE SCENE: THE 40 MM GRENADE GOES FROM STRENGTH TO STRENGTH

Grenade launchers have been shown to be extremely effective in combat, providing significant firepower against enemy forces in a variety of battlefield scenarios. The powerful 40 mm x 53 grenade is particularly potent, and over recent years has seen several capability enhancements to address emerging threats, including weaponized UAVs.

Automatic grenade launchers (AGL) – also known as grenade machine guns (GMGs) – are a key asset for many military forces today.

They can be mounted onto light vehicles or boats, usually in a remote weapon station (RWS) configuration or, like traditional machine guns, on a static tripod. They provide significant firepower and are capable of firing hundreds of low-velocity grenades a minute against targets.

Possibly the most ubiquitous AGL is the US-developed Mk19, a belt-fed, blowback-operated machine gun that was first fielded several decades ago but is still in widespread use around the world today.

The US military has since introduced a new lighter weight AGL, known as the Mk47, which has seen use with Special Forces units. This AGL, as well as other comparable systems, has benefited from the integration of advanced fire control systems (FCS), which improve accuracy and first-round hit probability.

An FCS can also be coupled with highly versatile airburst munitions, which improve the ability to hit targets hiding behind cover (also known in military language as "defilade"), and even airborne targets such as unmanned aerial vehicles (UAVs).

Nammo is a leading manufacturer of airburst 40 mm x 53 for AGLs, with the US Navy qualifying the company's first Programmable Pre-fragmented High Explosive (PPHE – Mk285 Airburst) type in 2006.

The company has gone on to develop the HE Dual Purpose airburst munition (HEDP – Mk314), which is highly versatile and can be used against several target types – including armor – owing to its shaped charge warhead design.

There are also radio frequency (RF) variants of both – the C171 PPHE-RF and NM264 HEDP-RF – which means the munitions can be programmed to airburst wirelessly as the round leaves the gun.

The 40 mm x 53 airburst grenade is constantly evolving to meet emerging requirements, and this is especially the case for countering rogue drones. Helge Stadheim, Program Manager for the Small & Medium Caliber Ammunition range, said, "Once you show a customer an airburst round, they are immediately interested." He explained, "It's something that everybody wants, but it took some years before it gained momentum."

Several successful demonstrations of Nammo's 40 mm x 53 airburst munitions in a counter-UAV (C-UAV) role have certainly helped to build that momentum. The company has worked closely with RWS specialists, including Kongsberg Defence & Aerospace, to refine its 40 mm x 53 airburst offerings as part of an integrated C-UAV solution.

Future customers will be safe in the knowledge that not only will they have an effective counter-drone solution with Nammo's 40 mm x 53 ammunition, but they will also be able to address other targets if required, including armored vehicles and enemy forces in defensive positions.

20 mm x 102
MP LD M70 AND MP LD M70 A1

Mission

The 20 mm x 102 Multipurpose Low-Drag (MP LD) round is the superior aircraft ammunition, designed to defeat multi-spectrum target types up to light armored vehicles. The projectile's low-drag design maintains higher velocity and reduces the time of flight, compared to the M50 series. Lower flight time increases hit probability, and higher impact velocity improves lethality. The round is initiated by pyrotechnics and has a natural delay, ensuring delivery of the incendiary, blast and fragmentation effects inside the target. The Multipurpose technology is the same as used in the PGU-28 A/B round, and the round has similar design and performance characteristics. They are available with both copper (MP LD M70) and sintered iron (MP LD M70 A1) rotating bands, and comply with STANAG 3585 requirements.

Projectile weight	100 g
Muzzle velocity	1 039 m/s
Dispersion	Mean R ≤ 0.167 m at 200 m
Service temperature	-54°C to +71°C

Status

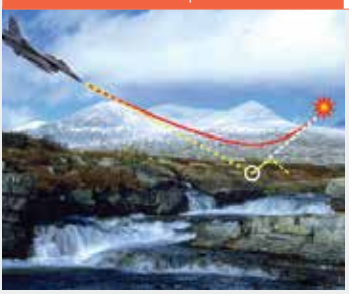
Qualified for use in M61, M197 and M39 guns.

20 mm x 102
TP-RRR LD AND TP-RRR LD M2

Mission

The 20 mm x 102 TP-RRR LD ammunition is designed for training purposes and has a Reduced Ricochet Risk (RRR) effect. The projectile disintegrates when impacting the target, creating high drag fragments with no ballistic properties which are unable to reach the aircraft flight path, providing a reduced surface danger zone. The rounds are successfully used as suppressive fire in offensive missions when low collateral damage is of importance. With its low drag design, they have a ballistic match to the 20 mm MP LD M70 A1. The rounds are available with both copper (TP-RRR LD) and sintered iron (TP-RRR LD M2) rotating bands, and comply with STANAG 3585 requirements.

Projectile weight	100 g
Muzzle velocity	1 039 m/s
Dispersion	Mean R ≤ 0.167 m at 200 m
Service temperature	-54°C to +71°C



Status

Qualified for use in M61, M197 and M39 guns.

20 mm x 102
TP LD M12 AND TP-T LD M13

Mission

The 20 mm x 102 TP LD M12 is training ammunition with design and performance characteristics equal to the PGU 27A/B. With its low drag design, it has a ballistic match to the 20 mm MP LD M70 A1. The 20 mm x 102 TP-T LD M13 is a training ammunition with a tracer, equal to the PGU 30A/B. Both rounds comply with STANAG 3585 requirements.

Projectile weight	101 g
Muzzle velocity	1 039 m/s
Dispersion	Mean R ≤ 0.167 m at 200 m
Service temperature	-54°C to +71°C

Status

Qualified for use in M61, M197 and M39 guns.

20 mm x 102
MP M70 A2

Mission

The 20 mm x 102 Multipurpose ammunition is designed to defeat targets ranging from all kinds of aircraft to light armored vehicles. The round has ballistics equal to M50 series rounds and is used on both fighter aircraft and attack helicopters. It is initiated by pyrotechnics and has a natural delay, ensuring delivery of the incendiary, blast and fragmentation effects inside the target. The round complies with STANAG 3585 requirements.

Projectile weight	102 g
Muzzle velocity	1 030 m/s
Dispersion	Mean R ≤ 0.139 m at 200 m
Service temperature	-54°C to +71°C

Status

Qualified for use in M61, M197 and M39 guns.

20 mm x 102 TP-M

Mission

20 mm x 102 TP-Marker is a training ammunition with a marker/spotter function. The round has an inert TP body, with a pyrotechnic-filled nose cap providing a flash effect when hitting the target, giving the same visual effect as firing live Multipurpose rounds. This provides the shooters with a realistic training scenario, without using combat rounds. It has an M50 series design and a ballistic match to the 20 mm MP M70 A2, and complies with STANAG 3585 requirements.

Projectile weight	102 g
Muzzle velocity	1 030 m/s
Dispersion	Mean R ≤ 0.139 m at 200 m
Service temperature	-54°C to +71°C

Status

Qualified for use in the M197 gun.

20 mm x 102 TP AND TP-T

Mission

This training ammunition is for use on aircraft equipped with 20 mm Vulcan guns. It is available with or without a tracer, and both variants comply with STANAG 3585 requirements.

Projectile weight	100 g/94.6 g
Muzzle velocity (24 m)	1 030 m/s
Dispersion	Standard H&V deviation ≤ 0.4 mil
Tracer	→ 1.9 s
Service temperature	-54°C to +71°C

Status

Qualified for M61 and M39 guns.

20 mm x 128
HEI/SD AND HEI-T/SD

Mission

Highly efficient High Explosive/Incendiary (HEI) rounds for anti-aircraft use on the Oerlikon guns.

Projectile weight	102 g/112 g
Muzzle velocity	1 050 or 1 100 m/s
Dispersion	Standard H&V deviation ≤ 1 mil
Tracer	≥ 2.5 s
Self-destruction	Yes
Service temperature	-54°C to +71°C

Status

Qualified for use in Oerlikon 20/85 and Oerlikon 20/120 by Spanish MoD.

20 mm x 128 SAPHEI/SD

Mission

Armor Piercing/High Explosive/Incendiary (SAPHEI) round for anti-aircraft use on 20 mm Oerlikon guns.

Projectile weight	128 g
Muzzle velocity	1 050 or 1 100 m/s
Dispersion	Standard H&V deviation ≤ 1 mil
Penetration	20 mm NATO plate at 30° at 150 m
Self-destruction	Yes
Service temperature	-54°C to +71°C

Photo: "20 mm gun" by Richard Symonds is licensed under CC BY-SA 3.0

Status

Qualified for use in Oerlikon 20/85 and Oerlikon 20/120 by Spanish MoD.

20 mm x 128 API-T

Mission

Traced Armor Piercing/Incendiary (API) round for anti-aircraft use on 20 mm Oerlikon guns.

Projectile weight	112.5 g
Muzzle velocity	1 050 or 1 100 m/s
Dispersion	Standard H&V deviation ≤ 1 mil
Penetration	40 mm NATO plate at 30° at 200 m
Tracer	→ 2.5 s
Service temperature	-54°C to +71°C

Status

Qualified for use in Oerlikon 20/85 and Oerlikon 20/120 by Spanish MoD.

20 mm x 128 TP AND TP-T

Mission

Training ammunition for use on Oerlikon anti-aircraft guns. Ballistically matched to the HEI/SD, HEI-T/SD, API-T and SAPHEI/SD combat rounds.

Projectile weight	125 g
Muzzle velocity	1 050 or 1 100 m/s
Dispersion	Standard H&V deviation ≤ 1 mil
Tracer	→ 4 s
Service temperature	-54°C to +71°C

Status

Qualified for use in Oerlikon 20/85 and Oerlikon 20/120 by Spanish MoD.

20 mm x 139 MP-T SD

NM75 F2/DM91

Mission

The 20 mm x 139 Multipurpose ammunition with tracer and self-destruct device is designed to defeat a broad spectrum of targets, ranging from all kinds of soft skinned air and ground targets up to light armored and semi-hard targets. The tracer gives the shooter target correction information and the self-destruct device minimizes the risk for collateral damage. The hardened steel body with explosive filling gives significant penetration, blast, incendiary and fragmentation effects. The pyrotechnical initiation chain gives a natural delay ensuring all effects are delivered inside the target.

Projectile weight	122 g
Muzzle velocity	1 045 m/s
Tracer	≥ 3.7 s
Self-destruction	Yes
Dispersion	≤ 0.2 m x 0.6745 at 200 m
Service temperature	-40°C to +50°C

Status

Designated by BAAINBw in Germany with the number DM91 and the Norwegian Army with NM75 F2. Qualified for use in the Mk20 Rh202, the Giat F2 gun and the Denel GI-2.

25 mm x 137 SAPHEI-T

PGU-32/U

Mission

The 25 mm x 137 PGU-32/U SAPHEI-T features the Multipurpose technology with tracer, and is designed to defeat all kinds of soft targets as well as light armor targets. Pyrotechnical initiation provides a delay, ensuring the incendiary, blast and fragmentation effects are delivered inside the target, and a high graze angle sensitivity.

Projectile weight	185 g
Muzzle velocity	1 100 m/s
Tracer	≥ 1.7 s
Dispersion	Standard H&V deviation ≤ 0.8 mils
Penetration	6.5 mm RHA 60° NATO at impact velocity 800 m/s

Status

Qualified for use in the M242 Bushmaster gun, the GAU-12 for AV-8/B and GAU-22 for F-35.

25 mm x 137 APEX

PGU-47/U

Mission

The APEX is designed to defeat a multi-spectrum of target types ranging from air targets to both soft and armored ground targets. It has an explosive filled warhead, with a delayed initiation, so the blast, fragments and incendiary effect are delivered inside the target. A penetrator in the nose gives enhanced penetration capabilities. The APEX is designed specifically for the F-35 fighter, but it may also be used on platforms with a M242 Bushmaster gun.

Projectile weight	222 g
Muzzle velocity	970 m/s
Dispersion	Standard H&V deviation ≤ 0.5 mils
Penetration	14 mm steel 45° NATO at 9 000 ft 8 mm RHA 45° NATO at 9 000 ft
Tracer	≥ 2 s
Service temperature	-62°C to +80°C

Status

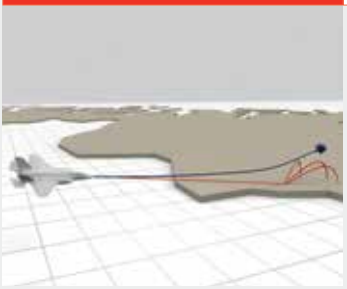
Ongoing integration activities for all three F-35 variants.

25 mm x 137
TP-RRR AND TP-T RRR
PGU-51/B

Mission

The ultimate choice of training ammunition for the F-35. With a ballistic match to 25 mm x 137 APEX/PGU-47/U and the Reduced Ricochet Risk (RRR) effect, it provides the safest gun training for pilot and aircraft, and a reduced surface danger zone. The round also features penetration and fragmentation properties, making it a good supplement to the combat round in scenarios where low collateral damage is of importance. It is available both with and without a tracer, and is the only training round with a tracer for the F-35.

Projectile weight	223 g
Muzzle velocity	970 m/s
Dispersion	Standard H&V deviation ≤ 0.5 mils
Tracer	≥ 2 s
Service temperature	-62°C to +80°C



Status

Undergoing ground qualification in the GAU-22/A and will be qualified in the F-35 CTOL.

25 mm x 137 MP-T SD

Mk2

Mission

The 25 mm x 137 Multipurpose ammunition with tracer and self-destruct device is designed to defeat a broad range of targets ranging from all kinds of soft skinned targets up to semi-hard armored targets and building constructions. The round is well known for its low dispersion and the self-destruct function minimizes the risk for collateral damage. Initiated by pyrotechnics with a natural delay to ensure delivery of the incendiary, blast and fragmentation effects inside the target.

Projectile weight	183 g
Muzzle velocity	1 100 m/s
Tracer/self-destruction	Minimum visible in 5.3 s Self-destruction after minimum 5.3 s
Maximum dispersion	Maximum 1.0 m at a range of 1 000 m (H&V)
Penetration	15 mm armor plate at 0° NATO at 500 m
Self-destruction	Yes
Service temperature	-54°C to +70°C

Photo: Italian Army photographers

Status

Qualified for use in
Bushmaster M242 and the KBA gun.

25 mm x 137
HEI AND HEI-T

Mission

Superior performance High Explosive/Incendiary (HEI) rounds with steel cartridge case for anti-personnel and anti-materiel use in Bushmaster and Oerlikon KBA guns.

Projectile weight	198 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.8 mils
Tracer	→ 1.7 s
Service temperature	-54°C to +71°C

Status

Qualified for use in
Bushmaster M242 and Oerlikon KBA.

25 mm x 137
HEI/SD AND HEI-T/SD

Mission

Superior performance High Explosive/Incendiary (HEI) rounds with steel cartridge case for anti-personnel and anti-materiel use on Bushmaster and Oerlikon KBA guns.

Projectile weight	180 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.8 mils
Tracer	→ 1.7 s
Self-destruction	Yes
Service temperature	-54°C to +71°C

Status

Qualified for use in Bushmaster M242 and Oerlikon KBA.

25 mm x 137
SAPHEI/SD AND SAPHEI-T/SD

Mission

Armor Piercing/High Explosive/Incendiary (SAPHEI) rounds with steel cartridge case for use against a variety of targets (light armor and materiel) in Bushmaster and Oerlikon KBA guns.

Projectile weight	170 g/180 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.8 mils
Penetration	10 mm NATO plate at 60° at 200 m
Tracer	→ 1.7 s
Self-destruction	Yes
Service temperature	-54°C to +71°C

Status

Qualified for use in Bushmaster M242 and the KBA gun.

25 mm x 137
TP AND TP-T

Mission

Steel case training ammunition for use on armored vehicles equipped with Bushmaster or Oerlikon KBA guns. Ballistically matched to the HEI and SAPHEI rounds.

Projectile weight	190 g/180 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.8 mils
Tracer	→ 1.7 s
Service temperature	-54°C to +71°C

Status

Qualified for use in Bushmaster M242 and Oerlikon KBA.

25 mm x 137
PLASTIC BLANK AMMUNITION

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +63°C
Safety temperature	-46°C to +71°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	5 m
Shelf life	15 years

Status

Qualified in 25 mm M242 Bushmaster Automatic Cannon equipped with ATK Hangfire Override Module (HOM), which gives original rate of fire (200 rpm). In service.

27 mm x 145 MP

DM73

Mission

The 27 mm x 145 Multipurpose ammunition is the ideal choice for defeating both aircraft and semi-hard ground targets. The round has a large HE charge giving it a powerful blast, incendiary and fragmentation effect, and the pyrotechnical initiation with delay ensures the effects are delivered inside the target.

Projectile weight	260 g
Muzzle velocity	1 025 m/s
Dispersion	Standard H&V deviation ≤ 1 mils
Penetration	Minimum 20 mm RHA at 400 m
Service temperature	-40°C to +70°C

Status

Qualified for use
in Eurofighter Typhoon
and the Tornado aircraft.

27 mm x 145 TP-RRR

DM68

Mission

The 27 mm x 145 TP-RRR ammunition is a training round with Reduced Ricochet Risk design. The projectile disintegrates when impacting the target, creating high drag fragments with no ballistic properties which are unable to reach the aircraft flight path. The round ensures safe training for personnel and aircraft.

Projectile weight	260 g
Muzzle velocity	1 025 m/s
Dispersion	Standard H&V deviation ≤ 1 mils
Service temperature	-40°C to +70°C

Status

Qualified for use in the JAS 39 Gripen aircraft.

30 mm x 113
TP AND TP-T

Mission

Steel case training ammunition
for use in airborne DEFA guns.

Projectile weight	236 g/245 g
Muzzle velocity	800 m/s
Dispersion	Standard H&V deviation ≤ 0.5 mils
Tracer	≥ 4 s
Service temperature	-54°C to +71°C

Status

Qualified for use in DEFA guns.

30 mm x 173
HEI AND HEI-T

Mission

Steel case High Explosive/Incendiary (HEI) rounds suitable for anti-materiel/ anti-personnel use on Bushmaster II and Mauser MK30 guns.

Projectile weight	378 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.5 mils
Tracer	→ 4 s
Service temperature	-46°C to +63°C

Status

Qualified for use in Mauser MK30 and Bushmaster II/MK44.

30 mm x 173
HEI/SD AND HEI-T/SD

Mission

Steel case High Explosive/Incendiary (HEI) rounds suitable for anti-materiel/ anti-personnel use in Bushmaster II and Mauser MK30 guns.

Projectile weight	363 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.5 mils
Tracer	→ 4 s
Self-destruction	Yes
Service temperature	-46°C to +63°C

Status

Qualified for use in Mauser MK30 and Bushmaster II MK44.

30 mm x 173
SAPHEI/SD AND SAPHEI-T/SD

Mission

Armor Piercing/High Explosive/Incendiary (SAPHEI) rounds with steel cartridge case for use against a variety of targets (light armor and materiel) in Bushmaster II and Mauser Mk30.

Projectile weight	363 g
Muzzle velocity	1 100 m/s
Maximum dispersion	Typical H&V deviation ← 0.5 mils
Penetration	30 mm NATO plate at 30° at 100 m
Tracer	→ 3 s
Self-destruction	Yes
Service temperature	-46°C to +63°C

Status

Qualified for use in Mauser Mk30 and Bushmaster II Mk44.

30 mm x 173 MP-T/SD

NM 222/Mk 264

Mission

This round is the ultimate choice for different target scenarios. The MP-T/SD round provides excellent penetration, blast, fragmentation and incendiary effects against a multiple range of targets.

Projectile weight	363 g
Muzzle velocity	1 070 m/s
Maximum dispersion	← 0.4 mils at 1 000 m
Penetration	10 mm RHA 60° NATO at 1 000 m
Tracer	≥ 4.6 s
Self-destruction	Yes
Service temperature	-46°C to +63°C

Status

Qualified in Bushmaster II Mk44, Mauser Mk 30-2 and DLS CAMGUN 30 GI-30.
More than 13 user countries in different applications.
Combat proven.

30 mm x 173 APFSDS-T

NM225/Mk258 Mod 0

Mission

The 30 mm x 173 APFSDS-T is designed to defeat the armor threats of today and tomorrow, such as infantry fighting vehicles, armored helicopters and other vehicles with heavy protection. The round has an extremely low drag coefficient giving short time of flight, high accuracy and superior penetration capabilities at more than 4 000 m. The tungsten penetrator is designed to provide high energy and maximum penetration capability.

Projectile weight	230 g
Muzzle velocity	1 430 m/s
Maximum dispersion	← 0.3 mils at 1 000 m
Penetration	→100 mm RHA at 1 000 m
Tracer	1.5 s
Service temperature	-46°C to +63°C

Status

Qualified for use in the Bushmaster II Mk44 and DLS CAMGUN 30 GI-30.

30 mm x 173 APFSDS-T

Mk258 Mod 1 Swimmer

Mission

The Mk258 Mod 1 APFSDS-T Swimmer round is the most advanced ammunition technology available. It is effective towards various surface threats, small- to medium-sized boats, personal watercraft that can be loaded with explosives and submerged targets, or it can be fired through the waves before impacting the target. The tungsten penetrator provides short time of flight, high impact energy and maximum penetration capability to more than 4 000 m.

Projectile weight	230 g
Muzzle velocity	1 430 m/s
Maximum dispersion	← 0.4 mils at 1 000 m
Penetration	→100 mm RHA at 1 000 m
Service temperature	-46°C to +63°C

Status

Qualified for use in the Bushmaster II Mk44 and DLS CAMGUN 30 GI-30. Qualified for service with US Navy/Marine Corps.

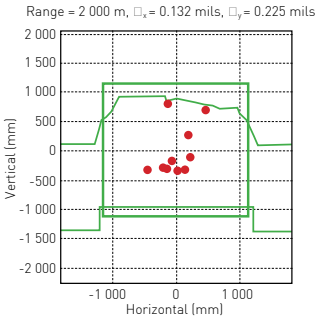
30 mm x 173 TP-T

NM219/Mk270

Mission

The 30 mm x 173 TP-T round is developed to be a ballistic match to the MP-T/SD NM222/Mk264. Precision tests show superb accuracy out to distances of 3 000 m.

Projectile weight	363 g
Muzzle velocity	1 070 m/s
Maximum dispersion	← 0.4 mils at 1 000 m
Tracer	≥ 4.7 s
Service temperature	-46°C to +63°C



Status

Qualified for the Bushmaster II Mk44, Mauser Mk30-2 and DLS CAMGUN 30 GI-30.

30 mm x 173
TPDS-T AND APDS-T
NM245/Mk320

Mission

This round offers realistic and effective training with a ballistic match to the APFSDS-T out to 1 200 m. It reduces the need for specific training areas with kinetic energy penetrators. It has the same safety template as the TP-T with a maximum range of 8 500 m. It also features short range war capabilities against a wide range of armor targets.

Projectile weight	190 g
Muzzle velocity	1 480 m/s
Maximum dispersion	← 0.4 mils at 1 000 m
Penetration	→ 70 mm RHA at 1 000 m
Tracer	≥ 1.5 s
Service temperature	-46°C to +63°C

Status

Qualified for use in the Bushmaster II Mk44 and DLS CAMGUN 30 GI-30.

30 mm x 173 PSRTA-T

Mission

Plastic Short Range Training Ammunition with Tracer (PSRTA-T) is intended for use in training areas where range restrictions preclude the use of full range standard service ammunition. The cartridges provide the ability to increase the frequency of carrying out realistic training scenarios, even on restricted ranges, in built-up areas and at shooting houses, therefore enhancing the proficiency of the user.

Projectile weight	45 g
Service temperature	Operational temperature -30°C to +63°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	1 200 m
Shelf life	15 years

Status

The 30 mm PSRTA is qualified for use in the Bushmaster II Mk44 and CAMGUN. Use of a Hangfire Override Module is optional.

30 mm x 173
PLASTIC BLANK AMMUNITION

Mission

Plastic Blank Ammunition is non-lethal ammunition designed to provide military forces and law enforcement communities with realistic training and maximum safety at low cost. Plastic Blank Ammunition allows training such as force on force exercises and firearm familiarization.

Service temperature	Operational temperature -30°C to +63°C
Storage temperature	Temperature and storage conditions as for live ammunition
Safety area	5 m
Shelf life	15 years

Status

Qualified in 30 mm Mk II Bushmaster Automatic Cannon/ Bushmaster II. ATK Hangfire Override Module (HOM) gives original rate of fire (200 rpm). Without the ATK HOM original rate of fire is reduced (60 rpm).

35 mm x 228
HEI/SD AND HEI-T/SD

Mission

High Explosive/Incendiary (HEI) rounds, with point-detonating or base-detonating fuze, suitable for anti-materiel/ anti-personnel use in Oerlikon guns.

Projectile weight	555 g/565 g
Muzzle velocity	1 180 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Tracer	→ 4 s
Self-destruction	Yes
Service temperature	-46°C to +63°C

Status

Qualified for use in Oerlikon guns 35/90 KDB type GDF-001, GDF-005, GDF-007 and Bushmaster III.

35 mm x 228 SAPHEI/SD

Mission

Armor Piercing/High Explosive/Incendiary (SAPHEI) rounds for use against a variety of targets (light armor and materiel) in Oerlikon guns.

Projectile weight	550 g
Muzzle velocity	1 180 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Penetration	40 mm NATO plate at 100 m
Self-destruction	Yes
Service temperature	-46°C to +63°C

Status

Qualified for use in Oerlikon guns 35/90 KDB type GDF-001, GDF-005, GDF-007 and Bushmaster III.

35 mm x 228
TP AND TP-T

Mission

Training ammunition for use in 35 mm Oerlikon guns and Bushmaster III. Ballistically matched to the HEI and SAPHEI rounds.

Projectile weight	550 g
Muzzle velocity	1 180 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Tracer	→ 6 s
Service temperature	-46°C to +63°C

Status

Supplied to Spanish MoD for 35 mm Oerlikon KDB gun.

40 mm x 53 PPHE

Mk285

Mission

The Mk285 Programmable Pre-fragmented High Explosive (PPHE) Airburst ammunition is specifically designed for the Mk47 gun. The Mk285 round gives excellent fragmentation and provides airburst with pinpoint accuracy. The Mk285 is designed to take out targets in defilade, with a fragment distribution sideways and rearwards.

Projectile weight	241 g
Muzzle velocity	240 m/s
Maximum dispersion	1.0 mils
Number of fragments	1 450
Tracer/self-destruction	Optional/electronic SD
Airburst accuracy	1 ms resolution
Service temperature	-32□C to +63□C
Safety temperature	-46□C to +71□C

Status

Qualified by the US Navy in 2006. More than 100 000 rounds produced and in service.

40 mm x 53 PPHE-RF

C171

Mission

Programmable Pre-fragmented High Explosive – Radio Frequency Airburst (PPHE-RF) ammunition is for use in any 40 mm Automatic Grenade Launcher (AGL) weapons. The wireless programming unit is easily adaptable to any fire control system. The C171 round gives excellent fragmentation and provides airburst with pinpoint accuracy. The C171 is designed to take out targets in defilade, with a fragment distribution sideways and rearwards.

Projectile weight	242 g
Muzzle velocity	240 m/s
Maximum dispersion	1.0 mils
Number of fragments	1 450
Tracer/self-destruction	Optional/electronic SD
Airburst accuracy	1 ms resolution
Service temperature	-32□C to +63□C
Safety temperature	-46□C to +71□C

Status

Qualified in the H&K AGL weapon. In service.

40 mm x 53 HEDP-AB

Mk314

Mission

The High Explosive Dual Purpose Airburst (HEDP-AB) ammunition is specifically designed for the Mk47 gun system. The Mk314 HEDP round provides airburst with pinpoint accuracy. The HEDP warhead provides fragmentation, penetration, blast and incendiary effect with a high reliability. This allows for different target scenarios with only one type of 40 mm round.

Projectile weight	247 g
Muzzle velocity	240 m/s
Maximum dispersion	1.0 mils
Number of fragments	1 200
Penetration	→ 65 mm RHA
Tracer/self-destruction	NA/electronic SD
Airburst accuracy	1 ms resolution
Service temperature	-32□C to +63□C
Safety temperature	-46□C to +71□C

Status

Qualified by the US Navy.

40 mm x 53 HEDP-RF

NM 264

Mission

The HEDP High Explosive Dual Purpose Airburst – Radio Frequency (HEDP-RF) is designed for use in any 40 mm Automatic Grenade Launcher (AGL) weapon. The wireless programming unit is easily adaptable to any fire control system. The HEDP-RF round provides airburst with pinpoint accuracy. The HEDP warhead provides fragmentation and penetration with high reliability. This allows for different target scenarios with only one type of 40 mm round.

Projectile weight	247 g
Muzzle velocity	240 m/s
Maximum dispersion	1.0 mils
Number of fragments	1 200
Penetration	→ 65 mm RHA
Airburst accuracy	1 ms resolution
Service temperature	-32□C to +63□C
Safety temperature	-46□C to +71□C

Status

Qualified and in service.

MANUAL PROGRAMMING UNIT (MPU) FOR NAMMO'S 40 mm RF AIRBURST AMMUNITION

Mission

The MPU is a true, low-cost solution that will eliminate the use of expensive fire control systems to program Nammo's 40 mm RF airburst ammunition. The MPU can be mounted on almost any Automatic Grenade Launcher (AGL) without significant changes to the weapon and its functionality. By using the MPU, 40 mm airburst solutions are within reach without costly investments in complicated and sensitive fire control systems.

Battery life	72 hours of normal use
Weight	1 195 g including battery pack
Width	202 mm
Height	96 mm
Depth	121 mm
Operational temperature	-40°C to +63°C
Storage temperature	-46°C to +71°C

40 mm x 53
HEDP AND HEDP-SD

Mission

Dual Purpose HV grenades for use on Automatic Grenade Launchers (AGL) against a variety of targets (light armor, materiel or dismounted infantry). Available with standard PD or self-destruct fuzes.

Projectile weight	245 g
Muzzle velocity	240 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Penetration	50 mm (269–352 HB) at 65 m
Tracer/self-destruction	N/A / 14 s
Service temperature	-46°C to +63°C
Safety temperature	-54°C to +71°C

Status

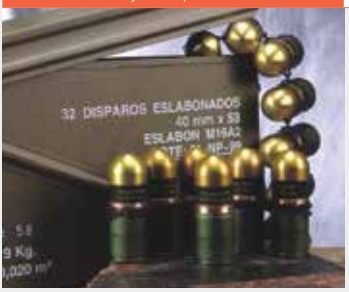
Qualified for use in grenade launcher Mk19 and LAG 40. Tested in Mk47 and H&K grenade launcher. HEDP round homologated by Spanish MoD.

40 mm x 53
HE AND HE/SD

Mission

HV High Explosive (HE) grenades for anti-personnel/anti-materiel use on Automatic Grenade Launchers (AGL). Available with standard PD or self-destruct fuzes.

Projectile weight	240 g
Muzzle velocity	240 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Self-destruction	N/A/Yes
Service temperature	-46°C to +63°C
Safety temperature	-54°C to +71°C



Status

Qualified for use in grenade launcher Mk19 and LAG 40. Tested in Mk47 and H&K grenade launcher. HE round homologated by Spanish MoD.

40 mm x 53 TP AND TP-T

Mission

40 mm x 53 HV training ammunition suitable for use with NATO standard Automatic Grenade Launchers (AGL), such as the Mk19, Mk47, LAG 40 and H&K.

Projectile weight	245 g/249 g
Muzzle velocity	240 m/s
Maximum dispersion	Typical H&V deviation ← 1 mils
Tracer	→ 4 s
Service temperature	-46°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified for use in grenade launcher Mk19 and LAG 40. Tested in Mk47 and H&K grenade launcher. TP-T round homologated by Spanish MoD.

40 mm x 53 TPM-T

NM 265

Mission

Training ammunition designed for use in any 40 mm Automatic Grenade Launcher (AGL) weapons. The cartridge has similar ballistic characteristics as standard 40 mm rounds. The TPM-T has an environmentally friendly impact signature and tracer capability.

Projectile weight	247 g
Muzzle velocity	240 m/s
Maximum dispersion	1.0 mils
Impact signature	Orange
Tracer	→ 10 s
Service temperature	-46□C to +63□C
Safety temperature	-54□C to +71□C

Status

Qualified in the H&K AGL weapon.

40 mm x 53
DRILL CARTRIDGE

Mission

The 40 mm x 53 drill cartridge is used as a drill round to train users in handling ammunition and loading the Automatic Grenade Launcher (AGL), such as the Mk19, H&K GMG and Mk47. The cartridge is completely inert and simulates a loaded round of 40 mm HE ammunition in size, shape and weight. The round can be reused by twisting and pushing the link back to the initial position.

Cartridge weight	350 g

40 mm x 46 HELLHOUND™

Mission

This 40 mm low-velocity cartridge is a replacement for the standard, low-velocity round. It delivers twice the explosive fill, with an enhanced fragmentation pattern. It is most suited for close urban warfare settings due to the warhead design, which minimizes fragmentation back to the shooter.

Weight	0.301 kg
Maximum range	400 m
Muzzle velocity	76 m/s
Fuze	M550 or alternative fuze compliant with MIL-STD-1316

Status

Qualified and in service.

40 mm x 46
HE DOOR BREACHER

Mission

This innovative, low-velocity cartridge can be fired from single- or multi-launch 40 mm grenade launchers. It has proven breaching capabilities against both inward and outward opening doors, and no fragmentation is sent back at the shooter, minimizing casualties on both sides of the door.

Weight	0.25 kg
Maximum range	100 m
Velocity	75 m/s
Fuze	M550

Photo by Staff Sgt. Pablo Piedra

Status

Qualified and in service.

40 mm L/70
HE-T

Mission

Nammo is the true original equipment manufacturer (OEM) for conventional 40mm L/70 ammunition intended for Bofors Gun systems. The 40mm L/70 High Explosive-Tracer (HE-T) should be the selected round for tactical use, and ensures flawless functionality, high reliability and a tactical advantage for users.

Projectile weight	0.95 kg
Muzzle velocity	1 005 m/s
Maximum dispersion	0.9 m Vert and Lat at 600 m
Penetration	N/A
Tracer/self-destruction	≥ 4 s
Service temperature	-40°C to +60°C

Status

Qualified and in production.

40 mm L/70 TP-T

Mission

Nammo is the true original equipment manufacturer (OEM) for conventional 40 mm L/70 ammunition intended for Bofors Gun systems. The 40 mm L/70 Target Practice-Tracer (TP-T) should be the selected round for effective and realistic training. It ensures flawless functionality and minimum wear and tear in weapons.

Projectile weight	0.96 kg
Muzzle velocity	1 005 m/s
Maximum dispersion	0.9 m Vert and Lat at 600 m
Penetration	N/A
Tracer/self-destruction	→ 4 s
Service temperature	-40°C to +60°C

Status

Qualified and in production.

57 mm L/70 HE

Mission

Nammo is the true original equipment manufacturer (OEM) for conventional 57 mm L/70 ammunition intended for Bofors Gun systems. The 57 mm L/70 High Explosive (HE) should be the selected round for tactical use, and ensures flawless functionality, high reliability and a tactical advantage for the users.

Projectile weight	2.4 kg
Muzzle velocity	1 020 m/s
Maximum dispersion	0.26 Vert, 0.33 Lat at 600 m
Penetration	N/A
Tracer/self-destruction	N/A
Service temperature	-46°C to +63°C

Status

Qualified, in production.

57 mm L/70 TP

Mission

Nammo is the true original equipment manufacturer (OEM) for conventional 57 mm L/70 ammunition intended for Bofors Gun systems. The 57 mm L/70 Target Practice (TP) should be the selected round for effective and realistic training. It ensures flawless functionality and minimum wear and tear in weapons.

Projectile weight	2.4 kg
Muzzle velocity	1 020 m/s
Maximum dispersion	0.26 Vert, 0.33 Lat at 600 m
Penetration	N/A
Tracer/self-destruction	N/A
Service temperature	-46°C to +63°C

Status

Qualified, in production.

LARGE CALIBER AMMUNITION

- Main battle tank ammunition
- Artillery ammunition
- Mortar ammunition

NEW SHELL DESIGNS ARE FEELING THE PRESSURE

Extending the range of artillery is a key strategic priority for many armed forces today. Range extension is helped by the development of larger and more powerful cannons and projectiles, but this can create its own challenges that engineers are now looking to overcome.

For several decades, armed forces within the NATO alliance have relied on standard 39 caliber 155 mm artillery systems in wheeled, tracked and towed configurations. These systems are capable of firing projectiles at ranges of up to 30 km, mainly with the assistance of a rocket motor.

A more recent development has been the introduction of longer 52 caliber barrels, which have extended the range of 155 mm guns and have been adopted by a number of armed forces to replace aging 39 caliber systems.

Not content with the range afforded by 39 and 52 caliber barrels, the US Army is now developing an even longer barrel as part of its Extended Range Cannon Artillery (ERCA) project. This program is pioneering the development of a larger and higher-pressure 58 caliber (approximately 9 m) barrel, which will be integrated onto the army's M109A7.

The ERCA has already achieved impressive firing distances of 65 km, but these larger cannons present several challenges for engineers.

"In the past, guns were shorter and there was less propellant, and so it was an easier environment for the shell to survive," said Thomas Danbolt, Vice President of Large Caliber Ammunition at Nammo.

"When the barrel is longer, you have increased muzzle velocity and there is also a bigger chamber for more propellant, which means greater pressure when compared to legacy products," he explained. "The gun environment has become much tougher."

In the past, artillery shells would accelerate up to 700 m/s within a very short period of time, but now Nammo is working to ensure that its future long-range projectiles are able to accelerate to over 1 000 m/s, which is a 30 percent increase on legacy systems.

This requires stronger materials as well as newly designed components, according to Danbolt, which includes rocket motors for longer-range rocket-assisted projectiles (RAP).

In 2020, Nammo engineers demonstrated a new rocket motor that is specifically designed for long-range shells that will be fired using the next generation of cannons, such as the US Army's ERCA.

The aim for the new rocket motor is to fire a 155 mm projectile to a range of 80 km (up to an altitude of 25 000 m on a ballistic trajectory), double that of current systems. Nammo is using its extensive knowledge in rocket propulsion technologies for space and military applications to develop the new motor. "There are few companies out there that can build ammunition and rocket motors, and that's our competitive edge," said Danbolt.

120 mm IM HE-T

Mission

The 120 mm Insensitive Munition High Explosive-Tracer (IM HE-T) complements the tank's current main gun ammunition with an IM compliant full bore HE – Multipurpose warhead capable of defeating a target set that includes bunkers, fortifications, light armor, technical vehicles and personnel. The IM HE-T will increase the flexibility and capacity of using the main battle tank in current and future combat environments.

Cartridge weight	26.7 kg
Projectile weight	15.9 kg
Muzzle velocity	1 030 m/s
Target accuracy	2 000 m ≤ 0.30 mils
Fuze	Dual-mode. Superquick and delay
Tracer	Burning distance → 4 000 m
Service temperature	-46ºC to +63ºC
Safety temperature	-54ºC to +71ºC

Status

Qualified in Leopard 2 and M1. The round is in service in several countries.

120 mm IM TP-T

Mission

The Insensitive Munitions Target Practice-Tracer (IM TP-T) is a cost-effective full bore inert round with a ballistic match to the IM HE-T. It has an inert fuze, but with the possibility of setting it in delay or superquick mode. The IM TP-T is a perfect round for realistic training and target practice.

Cartridge weight	26.7 kg
Projectile weight	15.9 kg
Muzzle velocity	1 030 m/s
Target accuracy	2 000 m ≤ 0.30 mils
Tracer	Burning distance → 4 000 m
Service temperature	-46°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified in Leopard 2 and M1. The round is in service in several countries.

120 mm KE-TP

Mission

Kinetic Energy Target Practice (KE-TP) is a cost-effective round which fulfills modern training needs for the crews operating main battle tanks. The round meets the strict requirements for a training round regarding ballistic match, dispersion and safety range.

Cartridge weight	18.3 kg
Projectile weight	6.1 kg
Muzzle velocity	1 700 m/s
Maximum dispersion	← 0.30 mils
Tracer	Burning distance → 3 000 m
Safety range	← 8 000 m
Service temperature	-40ºC to +51ºC
Safety temperature	-40ºC to +63ºC

Status

Qualified. In serial production.
Produced under license
from Nexter.

120 mm IM CANISTER

Mission

The 120 mm Canister is effective against multiple targets in close combat terrain. It was originally designed for close-in defense of tanks against assaulting infantry and as an anti-structure round with limited collateral damage. In current operations, it has also shown its superiority on other targets. The Canister round makes the main battle tank more flexible in current and future combat environments.

Cartridge weight	22.9 kg
Muzzle velocity	1 410 m/s
Tungsten balls	Approx. 1 100
Effective range	500 m
Service temperature	-46°C to +63°C
Safety temperature	-54°C to +71°C

Status

Qualified. Based on GD-OTS's M1028.

155 mm
IM HE-ER

Mission

The Insensitive Munition High Explosive Extended Range (IM HE-ER) has a verified range of more than 40 km from a modern L52 JBMoU gun system. Low round-to-round dispersion, combined with an enhanced blast and fragmentation effect, optimizes the impact on semi-hard targets at long firing ranges. The round is designed to defeat light armor and soft targets, and for increased flexibility incorporates an interchangeable base bleed and hollow base.

Projectile weight with fuze	44.4 kg
Muzzle velocity	935 m/s (6 DM72/& in L/52)
Maximum range with base bleed	L52 gun: 41 km/L39 gun: 30 km
Maximum range with hollow base	L52 gun: 32 km/L39 gun: 24 km
Dispersion (20 km w/hollow base)	PE length ← ± 50 m/width ± 10 m
Explosive	→ 10 kg MCX-6100 IM Explosive
Service temperature	-46ºC to +63ºC

Status

Qualified.

155 mm HE-ER

Mission

The High Explosive Extended Range (HE-ER) has a verified range of more than 40 km from a modern L52 JBMoU gun system. Low round-to-round dispersion, combined with an enhanced blast and fragmentation effect, optimizes the impact on semi-hard targets at long firing ranges. The round is designed to defeat light armor and soft targets, and for increased flexibility incorporates an interchangeable base bleed and hollow base.

Projectile weight with fuze	44.4 kg
Muzzle velocity	935 m/s (6 DM72/& in L/52)
Maximum range with base bleed	L52 gun: 41 km/L39 gun: 30 km
Maximum range with hollow base	L52 gun: 32 km/L39 gun: 24 km
Dispersion (20 km w/hollow base)	PE length ← ± 50 m/width ± 10 m
Explosive	9 kg TNT/Comp B
Service temperature	-46ºC to +63ºC

Status

Qualified.

155 mm TP-ER

Mission

Cost-effective training round with ballistic match to IM HE-ER/HE-ER. Available in two versions: inert (no energetics) or with a small explosive spotting charge. Modular design: interchangeable base bleed and hollow base.

Projectile weight with fuze	44.4 kg
Muzzle velocity	935 m/s (6 DM72/& in L/52)
Projectile length	906 mm
Small explosive charge	DPX 3, Type 2 (Optional)
Maximum range with base bleed	(L52) 6 x DM72 → 40 km
Maximum range with hollow base	(L52) 6 x DM72 → 30 km
Dispersion (20 km w/hollow base)	PE length ← ± 50 m/width ± 10 m
Operating temperature	-46ºC to +63ºC
Storage temperature	-54ºC to +71ºC

Status

Qualified.

155 mm HE

Mission

The 155 mm High Explosive (HE) round with hollow base is a cost-effective solution for maximum performance against light armored and soft targets as well as for training purposes. The round is compatible with all fuzes according to STANAG 2916. The shell is also available with inert filling with ballistic match to a live shell.

Projectile weight without fuze	42.5 kg
Muzzle velocity	380 m/s to 800 m/s
Maximum range with hollow base	24 km
Probable error (of range)	≤ 0.5% (range) / ≤ 0.1% (deflection)
Explosive	9 kg TNT
Service temperature	-40°C to +52°C

Status

Qualified in K9 Thunder (L52), 155 GH 52 APU/155 K 98 (L52) and 155 K 83-97 (L39).

PROPELLING CHARGES

Nammo offers a wide and comprehensive range of products for field artillery and mortar systems. The product portfolio also includes training propelling charges for safe and easy mortar training. Propelling charge production in Nammo is consolidated at the Vihtavuori Plant. The Nammo products are a result of long experience, continuous development in close cooperation with Nammo customers and modern, flexible manufacturing processes.

Status

All artillery propelling charges are qualified.

60 mm, 81 mm AND 120 mm MORTAR PRACTICE AMMUNITION

Mission

Provides safe, realistic and low cost training for mortar crews, forward observers and fire direction control personnel. This ammunition is full caliber (not a sabot) and is ready to fire in all weather conditions. The pyrotechnic impact signature does not cause fragments and provides excellent fire adjustment training.

Caliber	Range scale	Maximum range	Minimum range	No. of ranges	Reuse
120 mm	Full	7 200	200	5	No
81 mm	Full	5 600	70	5	No
60 mm	Full	3 500	70	5	No

Status

Qualified for use in all 60 mm, 81 mm and 120 mm smooth bore mortar systems.

81 mm MORTAR ILLUMINATING ROUND

Mission

The 81 mm Mortar Illuminating Round is used for illumination of target areas during night missions or low-visibility conditions. The round functions by way of a time fuze, at a height of 400 m wherein the front and rear body are split, ejecting the parachute and illumination kit. The round is delivered as a ready-to-fire in 2-round containers, equipped with fuze and charge system.

Flying mass	4.0 kg
Number of charges	0+6
Muzzle velocity	75–316 m/s
Maximum range	5 400 m
Maximum gas pressure	96 MPa
Luminosity	1 300 000 Cd
Illuminating duration	Minimum 50 s
Service temperature	-46°C to +63°C

Status

Qualified. Compatible with all standard smooth bore muzzle loaded 81 mm mortar systems.

81 mm MORTAR IR-SMK

Mission

The 81 mm Mortar Infrared Smoke (IR-SMK) round provides visual and infrared screening for several minutes over a wide area. The round functions by way of a time fuze, at a height of 400 m wherein the front and rear body are split, ejecting burning smoke pots containing red phosphorus. The round is delivered as a ready-to-fire in 2-round containers, equipped with a fuze and charge system.

Payload	Red phosphorus
Flying mass	4.0 kg
Number of charges	0+6
Muzzle velocity	75–316 m/s
Maximum range	5 400 m
Maximum gas pressure	96 MPa
Obscuration time	Minimum 60 s
Service temperature	-46° to +63°C

Status

Qualified. Compatible with all standard smooth bore muzzle loaded 81 mm mortar systems.

81 mm MORTAR HE

Mission

The 81 mm Mortar High Explosive (HE) round is a fin-stabilized, naturally fragmenting round intended to be fired from muzzle loading smooth bore mortars. The round is provided with point-detonating fuze and is delivered as a ready-to-fire in resealable multi-round containers, equipped with fuze and charge system.

Explosive filling	TNT (0.7 kg)
Shell body	Cast iron
Flying mass	4.1 kg
Number of charges	0+6
Muzzle velocity	76–310 m/s
Minimum/maximum range	150 m/5 800 m
Maximum gas pressure	≤ 96 MPa (ESCP, STANAG 4110)
Service temperature	-46°C to +63°C

Status

In production and qualified. Compatible with all standard smooth bore muzzle loaded 81 mm mortar systems.

120 mm MORTAR HE

Mission

The 120 mm Mortar High Explosive (HE) round is a fin-stabilized, naturally fragmenting round intended to be fired from muzzle loading smooth bore mortars or modern breech loaded mortar systems. The round is provided with proximity or point-detonating fuze and is delivered as a ready-to-fire in 2-round containers, equipped with fuze and charge system.

Explosive filling	TNT (2.0 kg)
Shell body	Cast iron
Flying mass	13.0 kg
Number of charges	0+6
Muzzle velocity	103–455 m/s
Minimum/maximum range	8 400 m (3 m barrel) 8 000 m (2 m barrel) 7 800 m (1.6 m barrel)
Maximum gas pressure	≤ 164 MPa (ESCP, STANAG 4110)
Service temperature	-46°C to +63°C

Status

In production and qualified. Compatible with all standard smooth bore muzzle loaded 120 mm mortar systems and Patria's Turreted Mortar Systems (AMOS® and Nemo®) when equipped with stub case.

120 mm MORTAR HE-ER

Mission

The 120 mm Mortar High Explosive Extended Range (HE-ER) round is a fin-stabilized, naturally fragmenting round intended to be fired from muzzle loading smooth bore mortars or modern breech loaded mortar systems. The round is provided with proximity fuze and is delivered as a ready-to-fire in 2-round containers, equipped with fuze, charge system and stub case (if required).

Explosive filling	Comp B (3.4 kg)
Shell body	Forged steel
Flying mass	15.3 kg
Number of charges	0+6
Muzzle velocity	128–500 m/s depending on weapon system
Minimum/maximum range	300 m/9 800 m
Maximum gas pressure	≤ 214 MPa (ESCP, STANAG 4110)
Service temperature	-46°C to +63°C

Status

In production and qualified. Compatible with all standard smooth bore muzzle loaded 120 mm Mortar Systems and Patria's Turreted Mortar Systems (AMOS® and Nemo®) when equipped with stub case.

120 mm MORTAR IR-SMK

Mission

The 120 mm Mortar Infrared Smoke (IR-SMK) round provides visual and infrared screening with reduced toxicity over a wide area. The round functions by way of a time fuze, in a height from 400 m to 500 m wherein the front and rear body are split, ejecting burning smoke pots containing red phosphorus. Round is delivered as a ready-to-fire in 2-round containers, equipped with fuze and charge system.

Payload	Red phosphorus
Flying mass	14.0 kg
Number of charges	0+5
Muzzle velocity	100–391 m/s
Minimum/maximum range	300 m/8 300 m
Maximum gas pressure	≤ 150 MPa (ESCP, STANAG 4110)
Obscuration capability	Visual/IR → 60 s
Service temperature	-46°C to +63°C

Status

In production and qualified. Compatible with all standard smooth bore muzzle loaded 120 mm Mortar Systems and Patria's Turreted Mortar Systems (AMOS® and Nemo®) when equipped with stub case.

120 mm MORTAR ILLUMINATING ROUND

Mission

The 120 mm Mortar Illuminating Round is used for illumination of target areas during night missions or low-visibility conditions. The round functions by way of a time fuze, at a height from 500 m to 700 m wherein the front and rear body are split, ejecting the parachute and illumination kit. The round is delivered as a ready-to-fire in 2-round containers, equipped with fuze and charge system.

Flying mass	14.0 kg
Number of charges	0+5
Muzzle velocity	100–391 m/s
Minimum/maximum range	300 m/8 300 m
Maximum gas pressure	≤ 150 MPa (ESCP, STANAG 4110)
Luminosity	1 000 000 Cd
Illuminating duration	Minimum 50 s

Status

Under development.

SHOULDER-FIRED SYSTEMS

- Close combat weapons
- Lightweight assault weapons and training systems

THE M72: INNOVATION ENSURES LEGENDARY WEAPON DELIVERS A RELIABLE ADVANTAGE ON TODAY'S BATTLEFIELD

Weapons standing the test of time and continuously proving too effective in battle to be retired to a museum display – like Nammo's M72 Shoulder-Fired Series – are being successfully used on the modern battlefield today.

Photo: Sgt. Luke Kuennen / U. S. Marine Corps

Transitioning over time through several design iterations, the M72 weapon is locally manufactured in several countries, including Norway, which began licensed manufacture in 1966 for a local defense force requirement, and the US.

"Nammo has more than 20 countries buying M72 variants today," explained Quoc Bao Diep, Vice President of Shoulder-Fired Systems at Nammo. "This success is the result of several enhancements over the M72's original 1960s design, including to the launcher, warheads and fuzes."

Diep notes that soldier safety is a key driver for many improvements, including introduction of insensitive munitions (IM), as well as a two-step arming system for the fuze.

Nammo supported the recently completed US qualification of a new M72 fire-from-enclosure (FFE) solution, ensuring troops are safe and avoid injury when the M72 is fired from rooms, bunkers or enclosures. This unique variant means that Soldiers and Marines do not have to reveal themselves to combatants when firing the weapon.

"The new FFE is a true fire-from-enclosure capability unlike anything the Marine Corps has ever seen," said the Program Manager for Ammunition at Marine Corps Systems Command, in a news story published online in August 2020. "It will become a force multiplier."

Nammo's production of the FFE variants – known as the M72 Anti-Armor (A8) and M72 Anti-Structure Munition (A10) in US military service – is to begin in 2021, with fielding expected in FY2022. This newest variant continues the heritage of a battlefield legend, meaning the M72 will be in service for many years to come.

The shoulder-fired system, recognizable today by name rather than by appearance when compared to early versions, traces its legacy to World War II, when both Allied and Axis forces looked to neutralize tanks on the battlefield. The Germans pioneered the Panzerfaust, while the US deployed the M1 Bazooka, both able to fire a deadly high explosive anti-tank (HEAT) warhead capable of penetrating steel armor. Lessons learned from those early weapons resulted in the development of this lightweight, single-use, shoulder-fired weapon employed by an individual dismounted trooper to neutralize tanks and other targets.

As a lightweight rocket launcher developed in the 1960s, the M72 first saw combat during the Vietnam War. Designated as the M72, a 66 mm rocket launcher offers significant firepower in a small package weighing less than 4 kg, facilitating Soldiers or Marines being able to carry 2, or even 3, on patrol.

Earning a reputation for effectiveness and versatility, and benefitting from planned enhancements over the last six decades, M72 variants are currently in daily service around the world. With ongoing evolutionary development of planned system enhancements, including airburst technology, the M72 variants will continue to deliver revolutionary capabilities to the modern warfighter.

M72 FIRE FROM ENCLOSURE (FFE) ANTI-ARMOR (A8) AND ANTI-STRUCTURE MUNITION (A10)

Mission

The Nammo M72 FFE combines decades of innovation and Nammo expertise to deliver a world-leading close combat weapon. Disposable, easy to operate, and extremely lightweight and powerful, it provides true fire-from-enclosure (FFE) capability, allowing warfighters to maintain cover and concealed positions.
The anti-armor variant (M72 A8) is effective against technical vehicles, concrete walls and light armored personnel carriers, while the anti-structure variant (M72 A10) features an autonomous dual-mode fuze and can defeat brick, adobe, earthen fortifications and technical vehicles.

System weight and caliber	5.8 kg, 66 mm
Carry/extended length	785 mm/1 040 mm
Warhead type (explosive)	A8 – anti-armor (HE shape charge) A10 – anti-structure/fragmenting (HE thermobaric)
Fuze	A8 – dual safe (PD) A10 – dual safe, autonomous dual-mode (fast/delay) for multi-target capability
Muzzle velocity	166 m/s (21°C)
Dispersion	← 1.5 mils at 200 m
Minimum, effective and maximum range	25 m, 350 m and 1 200 m
Service temperature	-32°C to +63°C

Status

US Joint Service qualified.

M72 ANTI-STRUCTURE MUNITION (A12)

Mission

The Nammo M72 Anti-Structure Munition (A12) combines decades of innovation and Nammo expertise to deliver a world-leading close combat weapon. Disposable, easy to operate, and extremely lightweight and powerful, the M72 A12 provides significantly improved performance to the M72 A9 (Legacy ASM).
The autonomous dual-mode fuze functions in fast (hard target) and delay (soft target) modes, while the optimized steel warhead body delivers increased fragmentation and ballistic performance. The M72 A12 is effective against brick, adobe, earthen fortifications, technical vehicles, 1/2 inch glass and exterior doors.

System weight and caliber	4.2 kg, 66 mm
Carry/extended length	760 mm/990 mm
Warhead type (explosive)	Anti-structure/fragmenting (combined effects HE)
Fuze	Dual safe, autonomous dual-mode (fast/delay) for multi-target capability
Muzzle velocity	125 m/s (21°C)
Dispersion	← 1.5 mils at 200 m
Minimum, effective and maximum range	15 m, 300 m and 1 000 m
Service temperature	-40°C to +63°C

Status

Combat proven and in production.

M72 ANTI-STRUCTURE MUNITION REDUCED CALIBER (ASM RC)

Mission

The Nammo M72 Anti-Structure Munition Reduced Caliber (ASM RC) combines decades of innovation and Nammo expertise to deliver a world-leading close combat weapon. The system is disposable, easy to operate, extremely lightweight and powerful. The M72 ASM RC variant is suitable for defeating brick, adobe, earthen fortifications and technical vehicles. The carbon fiber warhead gives low collateral damage. The dual safe fuze and on-axis trigger equip the warfighter with an improved weapon system that is both safe and effective.

System weight and caliber	3.7 kg, 42 mm
Carry/extended length	780 mm/980 mm
Warhead type (explosive)	Anti-Structure (415 g DPX-6, Aluminized HE)
Fuze	Electronic piezo fuze, dual-mode (short and long delay), dual safe with graze function
Muzzle velocity	170 m/s (21°C)
Dispersion	← 1.5 mils at 150 m
Minimum, effective and maximum range	14, 350 and 1 000 m
Service temperature	-40°C to +60°C

Status

NATO qualified:
NSN 1340-25-152-8309.
Combat proven and in production.

M72 ENHANCED CAPACITY (EC)

Mission

The Nammo M72 Enhanced Capacity (EC) combines decades of innovation and Nammo expertise to deliver a world-leading close combat weapon. The system is disposable, easy to operate, extremely lightweight and powerful. The M72 EC can penetrate up to 450 mm RHA. The dual safe fuze and on-axis trigger equip the warfighter with an improved weapon system that is both safe and effective.

System weight and caliber	3.4 kg, 66 mm
Carry/extended length	780 mm/980 mm
Warhead type (explosive)	Heavy-Armor, Shaped Charge (315 g PBXW-11)
Fuze	Electronic piezo fuze, dual safe with graze function
Muzzle velocity	200 m/s (21°C)
Dispersion	← 1.5 mils at 250 m
Penetration	450 mm RHA (M72 EC MK1), 300 mm RHA (M72 EC MK2)
Minimum, effective and maximum range	20, 350 and 1 200 m
Service temperature	-40°C to +60°C

Status

NATO qualified:
NSN 1340-25-152-8486 (MK1).
NSN 1340-25-160-4778 (MK2).
Combat proven and in production.

M72 TRAINING SYSTEM

Mission

The M72 training system with the 21 mm subcaliber rocket gives a truly similar experience to the live round. The new on-axis trigger launcher may be adapted to use the 21 mm training rocket. The training system has the same weight as the combat system. This type of training is extremely cost-effective and safe for the user. The training launcher is reloadable multiple times.

System weight and caliber	3.5 kg, 21 mm
Projectile weight	0.16 kg
Carry/extended length	780 mm/980 mm
Warhead type	Steel rod with tracer
Muzzle velocity	220 m/s (21°C)
Dispersion	← 1.5 mils at 150 m
Training range	50–700 m
Maximum range	1 000 m
Service temperature	-30°C to +60°C

Status

NATO qualified: Legacy Launcher NSN 1055-25-148-0378.
New Launcher (EC/RC) NSN 1055-25-160-4775.

REFLEX SIGHT

Mission

The newly developed reflex sight improves day and night operability. It can be used by both right- and left-handed operators, and with standard night vision goggles. Easy to operate, it has a ballistic reticle with a moving target aim point.

Weight	240 g
Length, height, width	80 x 80 x 36 mm
Field of view by 120 mm eye distance	Minimum 50 mils
Service temperature	-40°C to +71°C
Waterproof	1 m
Reticle illumination	Thritium gas source Total activity 40 G.Bq/1 081 Mci Option: Battery source

Status

For M72 EC MK1 and MK2: NATO qualified with stock no. 1055-25-160-4775.
For M72 ASM RC: NATO qualified with stock no. NSN 1240-25-160-5032.

LASER SIGHT

Mission

The rocket-aiming laser and accompanying SFL-100 IR-aiming Laser System Kit are designed to military standards for the Nammo M72 systems. The laser offers improved first shot accuracy of over 60 percent and is available in Infrared (IR) and Visible Red. The system kit is quick and easy to attach and detach, and is attachable to M72 without removing the sling.

Weight (Laser System Kit)	170 g
Dimensions (Laser System Kit)	3.66 inch width, 1.31 inch height
Battery life	IR laser: over 12 hours Visible laser: over 12 hours
Adjustable ranges	50–200 m in 25 m increments

Status

Laser System Kit:
NSN 5855-01-627-6187.

BUNKER DEFEAT MUNITION (BDM)
M141

Mission

BDM is the first lightweight shoulder-fired weapon system with true Multipurpose effectiveness, and uses the same High Explosive Dual Purpose (HEDP) rocket as in the USMC SMAW. The HEDP rocket is packaged in a rugged, compact telescoping, disposable launcher that has all gunner controls needed to aim and fire the weapon. The BDM is highly effective against double reinforced concrete, triple brick, solid adobe, earthen fortifications, caves and technical vehicles.

System weight and caliber	7.2 kg, 83 mm
Carry/extended length	812 mm/1 372 mm
Warhead type (explosive)	Anti-Structure/Anti-Fortification (Aluminized HE)
Fuze	M420, dual safety, self-discriminating at impact (delay or impact)
Muzzle velocity	220 m/s
Minimum, effective and maximum range	15, 250 and 2 000 m
Service temperature	-45°C to +70°C

Status

US Type Classified:
NSN 1340-01-443-5477 DODIC HA08. Combat proven and in production.

OTHER PRODUCTS AND SERVICES

FRAGMENTATION HAND GRENADE (HGF) HGF165-3.5

Mission

HGF is meant for defensive use and provides a dense cloud of fragments with a nearly even 360□ distribution. The steel bodies are uniformly pre-fragmented to provide optimized penetration performance with a distribution of near-equal-sized fragments. With a compact size and weight, HGF165-3.5 is designed to be used in urban areas.

Dimensions	Height with fuze 93 mm Steel body diameter 63 mm
Weight	450 g
Explosive filling	Comp B (hexotol 60/40) or PBXN-110 165 g
Delay	3–5 s
Total number of fragments	2 500
Service temperature	-46°C to +63°C
Storing temperature	-54°C to +71°C

Status

HGF165-3.5 is qualified with the Finnish Defence Forces. NSN 1330-58-000-1750.

OFFENSIVE HAND GRENADE (HGO) HGO225-3.5

Mission

HGO provides an intensive shock effect with a very limited number of fragments. These grenades are also used for light wall and door breaching and clearing of IEDs.

Dimensions	Height with fuze 135 mm Body diameter 53 mm
Weight	350 g with fuze
Explosive filling	Comp B (hexotol 60/40) 225 g or PBXN-11, 260 g
Delay	3–5 s
Service temperature	-46°C to +63°C
Storing temperature	-54°C to +71°C

Status

Combat proven and in production.
NSN 1330-58-000-9637 with composite handle.

OFFENSIVE HAND GRENADE (HGO) HGO115-3.5 AND HGO50-3.5

Mission

HGO provides an intensive shock effect with a very limited number of fragments. These grenades are also used for light wall and door breaching and clearing of IEDs.

Dimensions	Height with fuze 85 mm Module body diameter 53 mm
Weight	205 g with fuze
Explosive filling	Comp B (hexotol 60/40), 115 g or PBXN-11, 130 g
Delay	3–5 s
Service temperature	-46°C to +63°C
Storing temperature	-54°C to +71°C

Status

HGO115-3.5 is qualified and in service in several countries.
HGO50-3.5 is in qualification.

SCALABLE OFFENSIVE HAND GRENADE (SOHG)

Base

Base+1

Base+2

Mission

SOHG provides overpressure effects for a variety of uses by connecting one to three body modules together. Each module can be fuzed and grenades can be used either separately or by connecting up to three modules together.

Dimensions	Height with fuze 85 mm Module body diameter 53 mm
Weight	230 g/module with fuze and 190 g/module without fuze
Explosive filling	Comp B (hexotol 60/40) 115 g/module or PBXN-110, 130 g/module
Delay	3–5 s
Service temperature	-46°C to +63°C
Storing temperature	-54°C to +71°C

Status

Combat proven and in production. NSN 1330-58-000-9745 with Comp B filling; NSN 1330-58-000-9744 with IM filling.

TRAINING HAND GRENADE

Training for
all tactical grenades

Mission

Training Hand Grenades provide a low cost and realistic option for instructing soldiers in the proper and safe handling of hand grenades. These training grenades use production parts and inert fill to match tactical grenades with the correct weight and balance. Training fuzes use all production parts and the same 3–5 second delay element plus a small pyrotechnical charge to produce a sound signal when thrown. Training grenades arrive in tactical packaging and include a user manual in their safe and proper use. These modules are reusable multiple times by replacing the training fuze assembly. Training grenades are safe for use on size-restricted training ranges.

Status

Training Hand Grenades
are qualified with the
Finnish Defence Forces.
NSN 1330-58-001-1099
with metallic fuze handle;
NSN 1330-58-001-1098
with composite fuze handle.

TTC SMOKE HAND GRENADE

Mission

The TTC Smoke Hand Grenade creates instant smoke and is less toxic compared to the conventional Smoke Hand Grenade. A rapid smoke screen is developed in less than one second from the burst.

Diameter	66 mm
Length	155 mm
Weight	600 g
Time delay	1.5 sec
Service temperature	-46°C to +63°C
Safety temperature	-46°C to +71°C
Packaging	6 grenades in M2A1 steel box
Danger area	Within 10 m from point of burst

Status

Qualified and in service.
NSN 1330-25-160-1549.

DIVER RECALL SIGNAL (DRS)

Mission

DRS is a safe and simple one-shot device for underwater signaling. It is used by diver support personnel on the surface to create an acoustic pulse underwater in the event of an incident that requires divers to exit the water.

Diameter	20 mm
Length	150 mm
Weight	185 g
Time delay	5 sec
Operating depth	5–8 m
Audible range	Up to 400 m
Service temperature	-46°C to +71°C
Safety temperature	-46°C to +71°C
Packaging	12 pcs. in M2A1 steel box

Status

Qualified and in service.
NSN 1370-25-160-9804.

M67 GRENADE

Mission

This grenade supplements small arms fire in close combat scenarios. It causes casualties with a high-velocity projection of fragments in a uniform distribution pattern. The 63.5 mm diameter steel sphere contains 6.5 oz of highly explosive filler, and is fitted with a fuze that initiates the charge. It has a delay time of 4–5 seconds after the safety lever is released. The fragmentation gives the grenade a lethal radius of 5 m, causes casualties at up to 15 m, and disperses fragments as far away as 230 m.

Grenade (with fuze)	
Weight	14 oz
Length maximum	89.6 mm
Diameter	63.5 mm
Explosive filler	
Type	Comp B
Fuze	Model M213
NSN	1330-00-133-8244
DODAC	1330-G881

Status

Qualified and in service.

SHOCK TUBE SYSTEM

Mission

The Shock Tube System is a non-electric, self-sufficient initiation system, insensitive to electrical and electromagnetic influence. The ST Starter can, without any preparation, be directly combined with other types of Shock Tube Units for many different kinds of blasting operations, including EOD, cutting, demolition, fortification work and rock blasting operations.

Single charges are initiated directly by the ST Starter, while charges connected in parallel or in series are initiated via a connector unit that maximizes the number of combinations.

Products

- ST Starter – up to 320 m.
- ST Detonator – available with a variety of delay times and lengths.
- Rapid Firing System (RFS 10 m) – a rapid firing system with a 10 m Shock Tube integrated into a spool. Can easily be extended by inserting a detonator from another RFS unit into the spool barrel.

ANTI-PERSONNEL OBSTACLE BREACHING SYSTEM (APOBS)

MK 7 MOD 2

Mission

APOBS is a self-contained, one-shot, expendable linear demolition charge. It is capable of safely clearing a path of 45 m in length by 0.6–2 m in width through many obstacles, such as anti-personnel mines, IEDs, pressure plates and multi-strand razor wires. This lightweight system can be carried easily by a 2-person team, weighing just 56 kg, and can be deployed in under 2 minutes. APOBS meets the Insensitive Munition (IM) standards as defined in MIL-STD-2105 and also the fuze board safety requirements of MIL-STD-1316. It also meets the Hazards of Electromagnetic Radiation to Ordnance (HERO) requirements.

Weight	56 kg
Deployment time	30 –120 seconds
Standoff distance	35 m
Shelf life minimum	15 years
Service life minimum	12 years

Status

Qualified and in service.

AIRCRAFT EJECTOR RELEASE CARTRIDGES

Cleaner burning release cartridges
CBC 1 AND CBC 4 Mod 1

Mission

Cleaner Burn Cartridges (CBC) for Aircraft Store Ejector Release Units have been developed in conjunction with the UK MoD to replace the ARD 446 with a cleaner, 1A-1W compliant cartridge.
The CBC series cartridge is cleared for use on both Tornado and Typhoon aircraft, and provides a consistent release pressure with less debris in the release unit, leading to reduced maintenance and downtime. The CBC 4 Mod 1 is qualified with REACH-compliant propellant.

	CBC 1	CBC 4 Mod 1
Ignitor	1A-1W	1A-1W
Compliance with EM.	Yes	Yes
Time to ignition	← 10 ms	← 10 ms
Peak pressure, mean	60 MPa	71 MPa
Service temp range	-54°C to +93°C	-54°C to +93°C

Status

In service with the UK RAF and other air forces on the Tornado and Typhoon aircraft. Direct replacement for the ARD 446.

70 mm WARHEAD

Mission

Nammo has proven technology to develop, qualify and manufacture advanced Warheads for different applications. The current product portfolio includes a family of 70 mm (2.75 inch) Rocket Warheads – Multi Purpose Penetrator (MPP) – which is offered in different configurations with both pyrotechnic and electronic fuzes adapted to either the conventional unguided system or the new generation of guided 70 mm rocket systems. Inert practice Warheads can also be offered. MPP represents a product evolution from Nammo's legacy RA79 Warhead, but with even better penetration capabilities and significantly improved Insensitive Munitions (IM) response. IM will be increasingly important for all modern weapon systems, and Nammo has developed and qualified unique technologies which significantly improve IM properties for Warheads according to the applicable NATO standards. Nammo's 70 mm Rocket Warhead family has proven excellent penetration capabilities in heavy targets and MPP is capable of penetrating up to 1 m (40 inches) of reinforced concrete, 25 mm steel (1 inch) or 2 m (80 inches) earth and timber bunker targets. MPP is also highly effective towards a broad range of lighter targets, including vehicles, due to the sensitivity of the fuze.

Status

NSN No 1340-01-562-1680. Combat proven and in production.

FLARE IGNITION PELLETS LP2000 AND FS03

Mission

Nammo Flare Ignition pellets are civilian pyrotechnical articles, designed solely to ignite flare gas by directing a large cloud of high-temperature sparks at the gas. The high-temperature sparks (60 degrees cone-shaped – 20 m) are released upon their exit from the Pellet Collector, and burn for a maximum of 6 seconds.

	LP2000	FS03
Diameter	20 mm	20 mm
Length	95.5 mm	90 mm
Weight	80 g	50 g
Packaging	32 pcs. in M2A1 steel box	50 pcs. in M2A1 steel box

Status

Qualified and in use for more than 20 years.

ROCKET MOTORS

Mission

Nammo has developed and produced advanced Rocket Motors, primarily for the NATO market. Since the early 1960s Nammo's main niche products (within tactical propulsion technologies) are Rocket Motors for short and medium range Air-to-Air missiles and Boosters for medium- to large-size Naval Missiles, both with and without Thrust Vector Control (TVC) systems. Nammo's product line contains a broad range of propulsion systems for advanced tactical missiles as well as Rocket Motors for space applications. Next generation propulsion for long range and high speed applications, both missiles and artillery extreme ranges, are technologies in development. Nammo is currently responsible for the Rocket Motor design/production in the following programs:

- AMRAAM (Advanced Medium Range Air-to-Air Missile) – Raytheon
- ESSM (Evolved Sea Sparrow Missile) – Raytheon
- IRIS-T (Air-to-Air Missile with TVC) – Diehl Defence
- IRIS-T SLM (Ground Based Air Defence Missile with TVC) – Diehl Defence
- IDAS (Interactive Defence and Attack for Submarines) – Diehl Defence
- EXOCET MM40 Block 3 (Anti-Ship Missile with TVC) – MBDA
- Sidewinder AIM-9L (Air-to-Air Missile) – Diehl Defence
- Penguin MK2/Mod7 (Anti-Ship Missile) – Kongsberg
- NSM (Naval Strike Missile) – Kongsberg
- ARIANE 6 DR (Distancing Rockets) – ArianeGroup
- P120 (Booster Igniter for Vega and Ariane 6) – ArianeGroup
- LMM (Light Multi-role Missile) – Thales
- Hybrid Motors and Monopropellant Thrusters for Space Applications (utilizing H_2O_2) – ESA and AVIO

NAMMO DEMIL

Demilitarization redefined

The Nammo Group believes in safe and secure demilitarization with a focus on environmentally responsible processes and production capabilities.

We have more than 50 years of demilitarization experience with operational facilities at Nammo Sweden AB in Vingåker, and Nammo NAD AS at Løkken Verk, Norway. In addition to being an operational site, Vingåker houses our international project headquarters, and from here we manage complex projects often involving customer product assessment, logistics planning, shipping, system design, demilitarization planning, processes and recovery/recycling before a customer receives a Certificate of Destruction.

Services

The market demand for the demilitarization of munitions within defense communities has steadily increased over the last 20 years. Nammo specializes in handling excess, outdated and obsolete conventional ammunition and explosive items. Our sites ensure the highest standards of safety and environmental consideration are applied within our processes; not only do these processes comply with European Union laws and regulations, but in many cases, they exceed them.

Long-term partnerships supplement Nammo's teams of experts with key suppliers, such as waste management companies and international logistics providers, which means that we can offer customers a full project solution tailored to their specific needs.

NAMMO NAD (AS) LØKKEN VERK

CONTROLLED UNDERGROUND DETONATION

- Inspection and assessment – Nammo technical specialist assesses natures for demil process
- Licensing and logistics – Nammo logistics arrange all shipping, licensing and transport of demil natures
- Storage at NAD Norway is up to 565 tons NEQ
- Demil natures are transported to the detonation chamber 900 m underground
- Donor charges are laid and detonated, up to 2.5 tons NEQ per detonation
- A Certificate of Destruction is issued, packaging returned (if required) and contract closed out

NAMMO SWEDEN (AB) VINGÅKER

HIGH-SPEED DISASSEMBLY, RECOVERY AND RECYCLING

- Inspection and assessment – Nammo technical specialist assess natures for demil process
- Licensing and logistics – Nammo logistics arrange all shipping, licensing and transport of demil natures
- Storage at Vingåker is up to 4 000 tons NEQ
- High-speed disassembly, separation of components, melt out of energetic material
- Recovery and recycling of metal and energetic material
- A Certificate of Destruction is issued, packaging returned (if required) and contract closed out

A complete demilitarization solution

- Customer product survey, inspection and assessment
- Logistics planning, including product shipping (road or sea), licenses, export, import and other legal documentation, security assessment and implementation ensuring safe arrival at Nammo (Norway or Sweden)
- Complete demilitarization processes to international, European and local environmental regulations
- Full accountability throughout all processes
- Ability to completely destroy security sensitive ammunition natures at NAD Norway
- Recovery, recycling and reuse (R3 Philosophy) of energetics where permitted, and recovery and recycling of metals
- Certificate of Destruction and close-out paperwork

THE LAPUA® BRAND

www.lapua.com

Nammo Group Small Caliber facilities in Lapua, Finland and Schönebeck, Germany manufacture premium small caliber centerfire and rimfire ammunition under the Lapua® brand.

For sport shooters, hunters, defense forces and law enforcement

The Lapua® brand is focused primarily on manufacturing premium quality small caliber ammunition for sport shooters, hunters, defense forces and law enforcement authorities. Lapua® cartridges and cartridge components have been on the market for over nine decades, and are world renowned for their superb quality and consistency. Lapua® ammunition has won numerous Olympic and World Championship medals for competition shooters around the world.

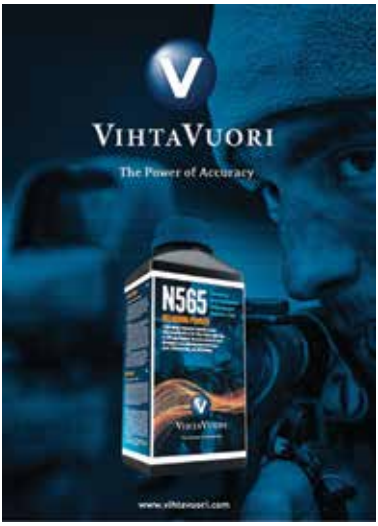
Not just according to toughest standards

Lapua® is a pioneer in the development and manufacture of sniper ammunition. All tactical ammunition is produced to the same match grade requirements as Lapua® target ammunition. A much-copied paragon of quality and accuracy is the .338 Lapua® Magnum, the preferred choice of professionals.

Lapua® quality is appropriately certified as well as approved by several special forces and armies worldwide. Long-term cooperation with various defense organizations helps Lapua® understand the special requirements of the military and other professional users. The goal is not to meet requirements but to exceed them.

VIHTAVUORI® POWDER

VIHTAVUORI®
www.vihtavuori.com



Nammo Vihtavuori® is a well-known manufacturer of propellants for both civil and military use since 1922. Vihtavuori® military powders cover medium and large caliber purposes and provide excellent performance, fulfilling the toughest professional needs and military specifications.

Vihtavuori® small caliber propellants are offered both for industrial use and within the civilian area as reloading powders. The selection covers almost 30 different types – the right choice for all disciplines, guns and shooting styles.

The Vihtavuori® small caliber powders

- Are manufactured by highly qualified employees
- Ensure clean burning and repeatable shooting properties in all weathers and conditions
- Have uniform and superb quality based on full control of the whole production chain, beginning from the production of nitrocellulose to the bottling of the end product
- Have strict quality acceptance limits which have helped re-loaders and cartridge manufacturers to achieve similar loads regardless of the production lot for more than 90 years
- Have achieved a strong position among top class shooters around the world
- Are REACH compliant and qualified according to STANAG 4170

BERGER

www.bergerbullets.com

Berger produces precision rifle bullets and premium ammunition for military and law enforcement (Mil/LE), competitive target and hunting applications. Proven in dozens of national and international shooting disciplines with countless world records, Berger has become the industry leader for long-range, precision shooting.

Berger's goal

The mission is to help customers shoot better. This is accomplished through innovative product design, continuous improvement of production processes, and interfacing with customers to better understand their needs. Only the highest quality materials, tolerances, and tooling are used to craft Berger products, along with an inflexible commitment to excellence and attention to detail.

Commitment to quality

Berger Match Grade Ammunition offers the shooter a level of quality never seen before in the commercial industry. Built for Mil/LE warfighters, operators, and members of our elite forces, Berger ammunition provides the reliability that is absolutely necessary to accomplish the mission without compromise.

Berger's tactical ammunition offerings have gone from concept to commercial development by partnering with our military's elite operators and listening to their unique needs. Prototypes are meticulously hand-crafted for special-application platforms, and once proven successful, introduced to the commercial market. Each product is assembled with the finest components and tested in the most extreme weather conditions, until it reliably delivers unprecedented long-range performance.

Tactical cartridge offerings

Berger tactical ammunition is available in cartridges which are popular with today's elite operators:

- 223 Remington 77 Grain OTM Tactical
- 6.5 Creedmoor 130 Grain Hybrid OTM Tactical
- 6.5 Creedmoor 140 Grain Hybrid OTM Tactical
- 260 Remington 130 Grain Hybrid OTM Tactical
- 308 Winchester 175 Grain OTM Tactical
- 308 Winchester 185 Grain OTM Tactical
- 300 Winchester Magnum 185 Grain OTM Tactical
- 300 Norma Magnum 215 Grain Hybrid OTM Tactical (ASR Round)
- 300 Norma Magnum 230 Grain Hybrid OTM Tactical
- 338 Lapua Magnum 300 Grain Hybrid OTM Tactical

Never settle

Made exclusively in the US, expect the highest quality components and construction, sub-MOA accuracy, low standard deviations and extreme spreads, all tailored to users' unique needs in the field or on the firing line.

HANSSON PYROTECH

Hansson PyroTech

www.ikarossignals.com

Hansson PyroTech is located in Lindesberg, Sweden, and produces, markets and sells world-class pyrotechnic distress signals for the commercial and leisure marine industries. All products are sold under the brand IKAROS.

Hansson PyroTech offers the complete SOLAS range of pyrotechnics to a global network of distributors and retailers.

SK AMMUNITION

www.sk-ammunition.com

In 1829, SK Ammunition started out by making percussion primers. Over the following 190 years, the company developed to become a significant producer of ammunition and explosives. Under the guidance of a new owner in 1992, the successful production of rimfire ammunition from the traditional SK brand could be further extended. For many years, sport shooters, biathletes and hunters have put their trust in cartridges from SK Ammunition, which are known all over the world for their high precision, absolute reliability and perfect quality.

Today, SK branded ammunition is made at Nammo Schönebeck GmbH. The SK product range covers all major rimfire sport shooting disciplines with widely known products like Rifle Match, Pistol Match, Long Range Match and Biathlon Sport.

MULTIPURPOSE (MP) CONCEPT

20 mm Multipurpose M70 was developed and qualified for the RNAF F-5 Aircraft in 1970. Thereafter, Nammo developed a range of ammunition for air force, navy and army applications ranging from 12.7 mm up to 40 mm. The last caliber to enter the MP family was 30 mm x 173 MPT/SD.

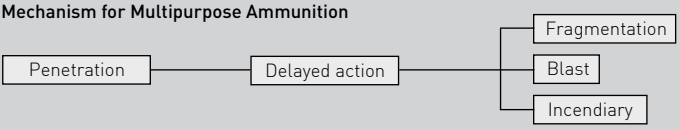
The MP concept (pyrotechnical ignition train instead of a traditional mechanical Safe & Arm device) is extremely effective as well as relatively inexpensive to manufacture.

Burning of the MP ammunition

The pyrotechnic ignition train results in a deflagration (not detonation) of the round, creating larger fragments than a detonation.

- Low burning propagation velocity of both the pyrotechnic charges and the explosive gives the delayed action of the MP round.
- Slow pressure buildup gives the characteristic MP fragmentation pattern which is a 20–30 degree cone along the line of fire.

Mechanism for Multipurpose Ammunition



PROGRAMMABLE AMMUNITION CONCEPT

H&K AGL with Fire Control Unit

In combat situations, troops struggle to neutralize an enemy that is hiding behind obstacles to avoid direct fire. Something more than artillery and mortar was required. Nammo has developed an airburst technology that is reliable, secure and effective that will help solve this tactical challenge with an excellent product on 40 mm Automatic Grenade Launcher (AGL) systems.

The Nammo Programmable Ammunition incorporates a radio frequency to program the ammunition, which has proved to be a reliable concept and easy to integrate on existing weapon platforms in the modern battlefield.

The advantages of Nammo's airburst technology are:

- Very easy to integrate on existing weapon platforms and fire control systems as well as being cost effective
- Reliable programming
- Accurate airburst position
- Multiple possibilities for a string of pearls
- Very low dud rate

Status

40 mm Programmable Ammunition is qualified and in operational use.

30 mm, M72 and 120 mm airburst technologies are in the early stages of development.

PLASTIC SHORT RANGE TRAINING AMMUNITION (PSRTA) CONCEPT

The PSRTA is intended for use in scenario and target practice training with fewer requirements for safety distancing, due to reduced maximum range. The PSRTA is designed to give military and security forces the following possibilities in training:

- Ballistically matched with standard combat ammunition to a certain distance.
- PSRTA is designed to be used for complex scenario training of tactics, techniques and procedures for squad, platoon and company level with minimum possibility of ricochet injuries. Due to short safety distance, it is possible to conduct training outside established firing ranges.
- Target training possible in areas with environmental restrictions, because the whole cartridge is made of entirely non toxic and lead free materials.
- PSRTA inflicts less or no damage to infrastructure and targets in built-up training areas.
- Reduced transportation costs of units because it's possible to train nearer to barracks.

NOTE: PSRTA is lethal and must not be used in force on force training.

Status

Qualified and in service for the following calibers:

- 5.56 mm x 45
- 7.62 mm x 51
- 12.7 mm x 99
- 30 mm x 173

INFRARED TRACER CONCEPT

Standard Tracer – visible

IR Tracer – invisible to the naked eye

Standard Tracer – observed through NVDs

IR Tracer – observed through NVDs

Standard Tracer – observed through NVDs

IR Tracer – observed through NVDs

To a large extent, today's combat units are using Night Vision Devices (NVDs) to enable stealthy night combat operations. This requires adapting traditional visible tracer ammunition to new operational scenarios. Nammo has met that requirement with the development of the latest Infrared Tracer technology. This tracer is totally invisible to the naked eye which solves several operational combat obstacles, giving the user clear advantages in stealth combat scenarios.

- Not visible to enemies without NVDs
- No tracking of own firing position
- No disturbance in friendly forces NVDs
- Maintain target location and observation after opening of fire
- No backwards illumination by your own tracers
- Reduced muzzle flash
- Minimal exposure of own units, reducing the possibility for enemies to judge your numbers or see the size of attacking force
- Optimal aiming aid in night combat at short distances

NAMMO RAUFOSS TEST CENTER, BRADALSMYRA

The test center was established as a shooting range in 1918, and today is a complete and competent test center covering the following areas:

- Environmental test facilities
- Ammunition testing and shooting ranges
- Propulsion systems (space and tactical)
- Measurement equipment and data acquisition
- Insensitive munition testing

Environmental test facilities

Vibration testing is used to map the ability of a product to withstand heavy loads by exposing the test object to the relevant frequency range, including half-sinus and trapezoidal shocks.

Vibration tests are performed on objects of significant weight and size according to international standards such as Ex. MIL-STD-810, AECTP-400 and DEF-STAN 00-35. Several different electrodynamic vibration systems are used, with the three largest able to be connected to a slip table and test at extreme temperature levels. The LDS994 shaker with a 2.5 x 2.5 m sliding table is the largest vibration system and is unique in size and performance.

Climatic chambers are equipped for temperature ranges from -62 °C to +180 °C, and also include control of humidity, pressure and even salt fog to test corrosion.

Ammunition testing and shooting ranges

The test center is NATO-certified and holds over 20 shooting ranges, for ammunition in the range 4.6 mm to 155 mm for any caliber. Shooting distances range from close distance to 2 000 m with a variety of weapon platforms available.

For dispersion, function and action-time, closed ranges from 30 m to 900 m are available.

Other specialized test facilities are available, including:

- Long-range artillery testing
- Sub-sea testing of special applications
- Space propulsion testing support
- Deep mine testing of extreme loads

Propulsion systems (space and tactical)

Nammo Raufoss holds a long legacy of testing solid state rocket motors for tactical and space applications, with continued ongoing development. This expanded, in later years, to liquid and hybrid systems enabling start-stop, deep throttling and pulse modes. Currently, the development of air-breathing technologies including dedicated test stands and equipment are being supported.

Typical parameters to be considered are pressure, thrust (1DOF/6DOF), temperature, strain, vibration and various cameras (HS/IR). The propulsion system testing teams have their own conditioning chambers which give products the thermal profile that is required.

Insensitive munition testing

Insensitive munition testing is performed to secure and document the products behavior in various cases.

The test center is experienced and equipped for tests such as:

- Fast cook off according to STANAG 4240
- Slow cook off according to STANAG 4382
- Bullet impact according to STANAG 4241
- Fragment impact according to STANAG 4496
- Sympathetic reaction according to STANAG 4396
- Shaped charge jet according to STANAG 4526
- Other specialized tests according to customer needs

If you need additional copies of
the Nammo Ammunition Handbook,
or if you have any questions, please
send your name, company, and address
by email to globalsales@nammo.com

www.nammo.com

Nammo