

# Catalogue 2016

## Ammunition



**nexTER**  
MUNITIONS



**MECAR**

 **SIMMEL**  
DIFESA



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# Field Artillery Ammunition



# 155mm BONUS MkII

BAE SYSTEMS

## TARGET DETECTION ANTI-ARMoured VEHICLE SHELL



### MISSION

BONUS MkII is a 155mm artillery shell designed for in-depth engagement of enemy armoured vehicles. Its two top-attack smart warheads destroy all main battle tanks and moving targets of the modern battlefield.

As a fully interoperable shell, BONUS MkII can be fired by all current and future artillery systems compliant with the JB MoU standard, including 52 calibre, as well as by other systems with their respective propellant charges. The BONUS MkII shell's distinctive feature is its unrivalled hit probability, which has been demonstrated during numerous production acceptance firings,

together with French and Swedish Army's firings.

### TECHNICAL DATA

#### SHELL

Weight without fuze	44.6kg
Length without fuze	898mm
Maximum range	NATO 39 calibre artillery: 27km NATO 52 calibre artillery: 35km

#### WARHEAD (TWO PER SHELL)

Weight	6.5kg
Descent rate	45m/s
Spin rate	15 revolutions/s
Search area	32,000m <sup>2</sup> per charge (64,000m <sup>2</sup> per shell)

### STATUS

In service

# 155-105mm SPACIDO



## COURSE CORRECTION SYSTEM



### MISSION

Field artillery accuracy improvement is a matter of continuous effort. Greater accuracy provides better engagement of high pay-off targets, minimises collateral damage effects and the safety distance with respect to friendly troops, while reducing the ammunition consumption. Less fired rounds allow a shorter time on the firing position, increased survivability, reduced logistics and lower costs.

### TECHNICAL DATA

- \_\_\_\_\_ Muzzle-velocity radar suited to any current or future gun
- \_\_\_\_\_ Suitable for use on all NATO-standard in-service 105mm and 155mm 39 to 52 calibre ammunition
- \_\_\_\_\_ GPS independant, no crypted components to manage, easy to use
- \_\_\_\_\_ Improvement of accuracy of a factor going up to 4 at long ranges

### STATUS

Under qualification

# 155mm LU 211

## INSENSITIVE OR CONVENTIONAL VERSION



### MISSION

The 155mm LU 211 HE shell provides a long-range fire capability. It can be equipped with a hollow base or a Base Bleed. It can engage targets at a range of 30km with NATO standard 155mm/39 calibre guns (M109, M198..) and of 40km with 155mm/52 calibre guns (CAESAR, PZH2000..) meeting the requirements of JB MoU and NABK standards when equipped with a Base-Bleed unit.

The efficiency of the 155mm LU 211 is more than twice that conventional 155mm shells, irrespective of angle of impact or burst height.

In addition, its piercing/penetration capability gives an excellent performance when used as an anti-structure ammunition.

The 155mm LU 211 shell can be filled with High Explosive like TNT, compo B and EIDS\* XF 13 333 explosive composition for the insensitive version called LU 211 IM. This version is fully IM compliant with the STANAG 4439. To be able to meet specific requirements, different versions for training are offered.

### DESCRIPTION

The projectile consists of two major components, a shell body filled with explosive and a hollow base or a Base Bleed Unit.

The driving band is made from a new alloy which permits it to be fired from 52 calibre guns.

A plastic obturator provides a more efficient sealing to propelling gases than is achieved with the driving band alone.

The driving band and the plastic obturator are protected by a grommet.

The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage.

# 155mm LU 211

## INSENSITIVE OR CONVENTIONAL VERSION

### TECHNICAL DATA

	LU 211 IM-HB	LU 211 IM-BB	LU 211 B-HB	LU 211 B-BB
<b>Type</b>	Insensitive High Explosive Hollow Base	Insensitive High Explosive Base Bleed	Conventional High Explosive Hollow Base	Conventional High Explosive Base Bleed
<b>Calibre</b>	155mm	155mm	155mm	155mm
<b>Projectile mass</b>	43.25kg with fuze	44.65kg with fuze	43.25kg with fuze	44.65kg with fuze
<b>Projectile length</b>	769mm without fuze	771mm without fuze	769mm without fuze	771mm without fuze
<b>Projectile filling</b>	~8.8kg XF *13333	~8.8kg XF *13333	~8.8kg Composition B	~8.8kg Composition B
<b>Fuze</b>	NATO Interoperability standard 2" thread fuze	NATO Interoperability standard 2" thread fuze	NATO Interoperability standard 2" thread fuze	NATO Interoperability standard 2" thread fuze

### PERFORMANCES WITH CAESAR 52 CAL/TCM

	LU 211 IM-HB	LU 211 IM-BB	LU 211 B-HB	LU 211 B-BB
<b>Muzzle velocity</b>	939m/s	946m/s	939m/s	946m/s
<b>Maximum range</b>	30km	40km	30km	40km

### PACKAGING

12 projectiles per pallet

### STATUS

In service

# 155mm LU 214 SMK-WP



## MISSION

The LU 214 is a smoke shell belonging to the 52 calibre shell family. It offers the same ballistic of the LU211 shell (HB and BB)

The functioning of the fuze triggers the detonation of the burst charge which causes the opening of the shell and the dispersion of the phosphorus over a radius of 25 to 30 m.

The white phosphorus produces spontaneously, upon contact with air, dense white smoke.

## DESCRIPTION

This projectile consists of two major components, a shell body filled with approximately 8.7kg of white phosphorus and can be equipped with an hollow base or a Base Bleed Unit.

The driving band is made from a new alloy which permits it to be fired from 52 calibre guns.

A plastic obturator provides a more efficient sealing to propelling gases than is achieved with the driving band alone. The driving band and the plastic obturator are protected by a grommet.

The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage.

## TECHNICAL DATA

	LU 214 WP HB	LU 214 WP BB
Type	White phosphorus smoke	White phosphorus smoke
Calibre	155mm	155mm
Projectile mass	43.25kg with fuze	44.65kg with fuze
Projectile length	769mm without fuze	771mm
Projectile filling	≈8.4kg White Phosphorus	≈8.4kg White Phosphorus

## PERFORMANCES

	LU 214 WP HB	LU 214 WP BB
Muzzle velocity	939m/s	946m/s
Maximum range	30km	40km
Dispersion in range	<0.4% mean range	<0.4% mean range
Smoke duration (s)	More than one minute	More than one minute

## PACKAGING

12 projectiles per pallet

## STATUS

In service

# 155mm LU 215 ILLUM



## MISSION

The LU 215 is an illuminating shell belonging to the 52 calibre shell family. The payload operates in the visible spectrum. This projectile is fired by 155mm howitzers and is used to illuminate the battlefield at night or during other conditions of reduced visibility.

## DESCRIPTION

The projectile with Base Bleed contains a payload, an expelling charge in the nose and a drogue parachute in the base. The payload is fitted with a delay element and contains a secondary expelling charge, the illuminant candle for visible spectrum illumination and the main parachute. A plastic obturator provides a more efficient sealing to propelling gases than is achieved with the driving band alone. The driving band and the plastic obturator are protected by a grommet. The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage. Fuze functioning causes ejection of the payload and ignition of the delay that allows a drogue parachute to decelerate the payload and for anti-rotational fins to de-spin the canister before the candle with main parachute is ejected and ignited. The burning candle, suspended below the main parachute then illuminates the target area whilst descending slowly. With the main parachute opened, the illuminant candle descends at around 5 m/s and producing approximately 1 200 000 candelas. A more than 600 meters diameter is effectively illuminated ( $\geq 3.4$  Lux) during 80 seconds.

## TECHNICAL DATA

Type	Illuminating with Base Bleed (US M864 profile)
Calibre	155mm
Weight of fuzed projectile	44.4kg
Projectile length	803mm without fuze
Filler and weight	~2.4kg illum compound
Body material	Steel
Fuze	NATO Interoperability standard 2" - Thread time fuze

## PERFORMANCE

Maximum range capability	Compatible with modular charge system up to Z6
Payload delivery range	~ 90% of the maximum ballistic range
Luminosity	$\geq 1\ 200\ 000$ candelas

**Illuminating target area : radius  $\geq 300$ m with direct illumination  $\geq 3.4$  lux during 80 seconds**

## PACKAGING

12 projectiles per pallet

## STATUS

Under qualification

# 155mm LU 216 ILLUM IR



## MISSION

The LU 216 ILLUM IR is an illuminating shell belonging to the 52 calibre shell family. The payload operates in the infrared spectrum. This projectile is fired by 155mm howitzers and used to illuminate discretely the battlefield at night thanks to a payload which operates in the infrared spectrum.

## DESCRIPTION

The projectile with Base Bleed contains a payload, an expelling charge in the nose and a drogue parachute in the base. The payload is fitted with a delay element and contains a secondary expelling

charge, the illuminant candle for infrared spectrum illumination and the main parachute. A plastic obturator provides a more efficient sealing to propelling gases than is achieved with driving band alone. The driving band and the plastic obturator are protected by a grommet. The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage. Fuze functioning causes ejection of the payload and ignition of the delay that allows a drogue parachute to decelerate the payload and for anti-rotational fins to de-spin the canister before the candle with main parachute is ejected and ignited. The burning candle, suspended below the main parachute then illuminates discretely the target area whilst descending slowly. With the main parachute opened, the infrared candle descends at around 5m/s and burns during 80 seconds producing less than 2500 candelas. With the use of night vision devices, a 2400m diameter illumination can be achieved.

## TECHNICAL DATA

Type	IR Illuminating with Base Bleed (US M864 profile)
Calibre	155mm
Projectile mass	44.4kg with fuze
Projectile length	803mm without fuze
Body material	Steel
Fuze	NATO Interoperability standard 2"- thread time fuze
Filler and weight	~2.4kg IR illum compound

## PERFORMANCE

Maximum range capability	Compatible with modular charge system up to Z6
Payload delivery range	~90% of the maximum ballistic range
Spectrum Bandwidth	0.7 $\mu$ m to 0.9 $\mu$ m
Radiometric Intensity	$\geq 250$ W/sr (0.7 - 0.9 $\mu$ m)
Luminosity	$\leq 2,500$ candelas
IR illuminating target area during 80 seconds	

## PACKAGING

12 projectiles per pallet

## STATUS

Under qualification

# 155mm LU 217 MS SMK



## MISSION

The LU 217 is a multi-spectral smoke shell belonging to the 52 calibre shell family. The base ejected payload operates in the infrared and visible spectrum. The projectile is fired by 155mm howitzers and is used for screening and obscuring in the infrared and visible spectrum.

## DESCRIPTION

The projectile with Base Bleed contains an expelling charge in the nose and canisters filled with a low toxicity chemical smoke compound. The canisters are stacked within the projectile and each has a perforated central tube. A plastic

obturator provides a more efficient sealing to propelling gases than is achieved with the driving band alone. The driving band and the plastic obturator are protected by a grommet. The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage. Fuze functioning causes ejection and ignition of the smoke canisters. An effective smoke cloud is produced within a few seconds and smoke emission occurs for 2 to 3 minutes.

## TECHNICAL DATA

Type	MS Smoke with Base Bleed (US M864 profile)
Calibre	155mm
Round length	803mm without fuze
Projectile mass	44.4kg
Projectile filling	Multispectral smoke compound
Body material	Steel
Filler and weight	~6kg smoke compound
Fuze	NATO interoperability standard 2" Thread time fuze

## PERFORMANCE

Maximum range	Compatible with modular charge system up to Z6
Payload delivery range	~90% of the maximum ballistic range
<b>Smoke efficiency : in visible spectrum and IR bandwidth 0.7 to 12µm</b>	
Smoke emission	120-180 seconds

## PACKAGING

12 projectiles per pallet
---------------------------

## STATUS

Under qualification

# 155mm LU 107 MK2



## MISSION

The 155mm LU 107Mk2 artillery shell while especially fitted for 39 calibre guns takes advantages of the technical progress derived from 52 calibre technologies in terms of accuracy, capability and safety. Compared to the well known M107 artillery shell, this new product based on a similar ballistics features offers an extended range thanks to its design compatible with a full charge firing. To be able to meet specific requirements, different LU107 Mk2 versions are offered:

- Conventional explosive version,
- Insensitive munition version (IM),
- Reduced range version for training.

## DESCRIPTION

This shell can also be fired in 45 and 52 calibre gun with a modular charge system. This projectile consists of a shell body filled with 7kg of explosive. The driving band is made from a new alloy which permits it to be fired from 52 calibre guns without any restriction and to extend the range in 39 calibres with M203 charge. The driving band is protected by a grommet. The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage. Thanks to a specific sealing ring screwed on the top of projectile, the LU107 Mk2 projectile is free of exudation.

## TECHNICAL DATA

Type	High Explosive (HE)
Calibre	155mm
Round length	~606mm without fuze
Projectile mass	42,97kg with fuze (820g)
Payload	~7kg TNT
Compliant	with M203 and MCS propelling charges
STANAG	4224 - 4518 - 4439 for LU107 version filled with explosive (TNT or IM)

## PERFORMANCE

Typical value	MV	Max range
39 cal. M119A2	686m/s	18,100m
39 cal. TCM Z5	808m/s	22,000m
39 cal. M203	830m/s	22,500m
52 cal. TCM Z6	940m/s	27,000m

Secured sealing for conventional explosive version

## PACKAGING

Standard wood pallet (20, 12 or 8 projectiles in tactical complete ground packs)

## TEMPERATURE LIMITS

Firing	-40°C to +63°C
Storage	-46°C to +71°C

## STATUS

In service

# 155mm LU 110 SMK-WP MK2



## MISSION

The LU110 Mk2 artillery shell while especially fitted for 39 calibre guns takes advantages of the technical progress derived from the 52 calibre technologies in terms of accuracy, capability and safety. Compared to the well-known M110 smoke shell pertaining to the 155mm M107 family, this new product features an extended range capability in 39 calibre gun while having similar ballistics. This shell can also be fired in 45 and 52 calibre gun with a modular charge system. The detonation of the burst charge, located below the booster of the fuze, causes the opening of the shell and the

dispersion of the phosphorus over a radius of 25 to 30m. The combustion of the white phosphorus produces an instantaneous and effective smoke screen.

## DESCRIPTION

The projectile consists of a shell body filled with 7kg of white phosphorus. The duration of the smoke screen is approximately 1 to 1.5 minutes. The maximum effectiveness is between 1 and 2 minutes. The driving band is made from a new alloy which permits it to be fired from 52 calibre guns without any restriction and to extend the range in 39 calibre with M203 charge. The driving band is protected by a grommet. The shell is delivered with a lifting plug designed to protect the projectile fuze area against accidental damage.

## TECHNICAL DATA

Type	Smoke White Phosphorus (SMK WP)
Calibre	155mm
Round length without fuze	~606mm
Projectile mass	42,97kg with fuze (820g)
Fuze	NATO interoperability standard 2" thread fuze
Body material	steel
Filler and weight	7kg white phosphorus

## PERFORMANCE

Smoke duration	More than one minute
Maximum range in 39 calibre gun	22,500m with M203
Maximum range in 52 calibre gun	27,000m with TCM Z6

## PACKAGING

12 projectiles per pallet
---------------------------

## STATUS

Qualified

# 155mm HE L15A1



## MISSION

This projectile is fired from 155mm howitzers and has own blast effect and fragmentation. Simmel Difesa's 155mm HE L15A1 is a projectile that can be fired by 155/39 and 155/52 guns. ATP version with the same ballistic characteristics is available.

## DESCRIPTION

The projectile is filled with TNT or Composition B. Projectiles may be equipped with Proximity, PD or MTSQ fuze or with a lifting plug.

## TECHNICAL DATA

Type	HE
Calibre	155mm
Complete projectile mass (with fuze)	43.5kg
Projectile length (without fuze)	778.5mm
Projectile filling (nominal)	11.3kg TNT or Comp B
Fuze	Proximity, PD or MTSQ

## PERFORMANCE

Maximum range in 39 calibre gun	24,000m
Operational temperature	-54°C to +63°C

## PACKAGING

8 projectiles per pallet
UN Classification: 1.1 D UN 0168

## STATUS

In service

# 155mm HE M107



## MISSION

This projectile is fired from 155mm howitzers and is used for blast effect and fragmentation. Simmel Difesa's 155mm HE is a projectile that can be fired by 155/39 and 155/52 guns. ATP version with the same ballistic characteristics is available.

## DESCRIPTION

The projectile is filled with TNT or Composition B. Projectiles may be equipped with Proximity, PD or MTSQ fuze or with a lifting plug.

## TECHNICAL DATA

Type	HE
Calibre	155mm
Complete projectile mass (nominal)	43kg
Projectile length (without fuze)	605mm
Projectile filling (nominal)	6.98kg TNT or Comp. B
Fuze	Proximity, PD or MTSQ

## PERFORMANCE

Maximum range in 39 calibre gun	18,100m
Operational temperature	-54°C to +63°C

## PACKAGING

8 projectiles per pallet
UN Classification: 1.1 D UN 0168

## STATUS

In service

# 155mm Modular Charge Systems



## MISSION

The Modular propelling Charge System (MCS), which has been developed under the Nexter Munitions prime contractorship replaces conventional propellant charges. Nexter Munitions Modular Charges System is actually qualified on the 155mm/52 cal. CAESAR artillery System. It is compliant with the JBMoU. Compared with the conventional propellant charges, the modular propellant charge system offers the following advantages:

- Easier and quicker handling
- Increased rate of fire
- Simplified logistics (only 2 types of modules)

## DESCRIPTION

The Modular Charge System (MCS) has been optimised through the definition of two propellant charges:

- The Bottom Charge System (BCM), consisting of 1 or 2 similar Bottom Charge Modules (BCM), particularly used for training purposes
- The Top Charge System (TCM), consisting of similar Top Charge Modules (TCM), 3 to 5 for 39 calibre ordnance or 3 to 6 for 52 calibre ordnance
- Distinction safety: no risk error between BCM and TCM

## TECHNICAL DATA

Type	Linked, reversible and rigid modular charge
Calibre	155mm
Colors	TCM : grey - BCM : green
Net mass	TCM : 2.8kg - BCM : 2.1kg
Propellant types	TCM : multibase - BCM : single base
Igniter	Black powder (both TCM and BCM)

## PERFORMANCE

Operational temperature range	-33°/+63°C (firing)
Storage temperature range	-33°/+71°C

## PACKAGING

<b>Bottom:</b> 6 per container, 16 containers per pallet
<b>Top:</b> 6 per container, 16 containers per pallet

## STATUS

In service

# 155mm Modular Charge Systems



## MISSION

Developed to comply with the Joint Ballistic Memorandum of Understanding (JBMou) Annex D requirements, Simmel Difesa's Modular Charge System is suitable for use on all the 155mm L39, L45 and L52 NATO standard guns (including PzH2000), to replace bagged charges system currently in use (M4A2, M3A1, M119, L10A1, L8A1 and similar). Simmel Difesa's Modular Charge System is qualified on the 155mm/52 cal. PzH2000 artillery system.

## DESCRIPTION

The system is based on two different modules (Bottom and Top) which can be used in different number to cover all firing range requirements of the 155mm gun systems. The BMCS is fully compliant with IM NATO requirements.

## TECHNICAL DATA

Type	Bottom	Top
Calibre	155mm	155mm

## PERFORMANCE

Operational temperature	-46°C to +63°C
Storage temperature	-46°C to +71°C

## PACKAGING

<b>Bottom:</b> 4 per container, 12 containers per pallet
<b>Top:</b> 6 per container, 12 containers per pallet
<b>UN Classification: 1.3 C UN 0242</b>

## STATUS

In service

# 155mm IPC35

## PROPELLING CHARGE FOR 39 CALIBRE ARTILLERY SYSTEMS



### MISSION

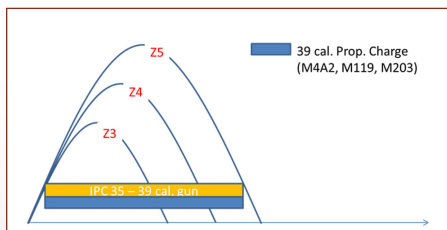
The 155mm IPC35 propelling charge is dedicated to the 155mm/39 cal. Artillery systems. It consists of a combustible case containing three bags of propellant covering the zones 3 to 5. This propelling charge is an all-in-one solution as an alternative to the set of US charges such as M4A2, M119, M203. It is a cheaper alternative of the modular charge systems (Top Charge Module) when the key features of the modular charge concept are not requested.

### DESCRIPTION

The 155mm IPC35 propelling charge meets the ballistic requirements of the Joint Ballistic Memorandum of Understanding (JBMOU) (similar to the ones of the Modular Charge Systems). This charge can be also used in 45 & 52 calibers without any restrictions.

### TECHNICAL DATA

Type	Monolithic combustible case with 3 increments
Calibre	155mm
Total length	<780mm
Total mass	14kg
Propellant types	Multibase propellant
Igniter	Black powder



### PERFORMANCE

Maximum range (155 LU211 BB)	Up to 30km
Operational temperature range	-33°/+63°C (firing)
Storage temperature range	-33°/+71°C

### PACKAGING

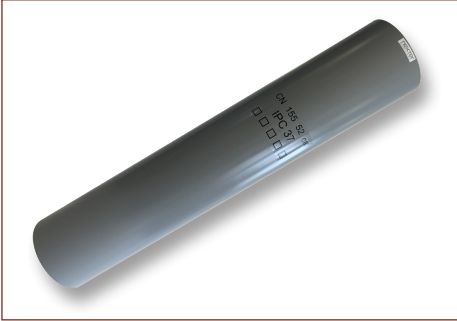
1 charge per container, 16 containers per pallet

### STATUS

Under development

# 155mm IPC37

## PROPELLING CHARGE FOR 52 CALIBRE ARTILLERY SYSTEMS



### MISSION

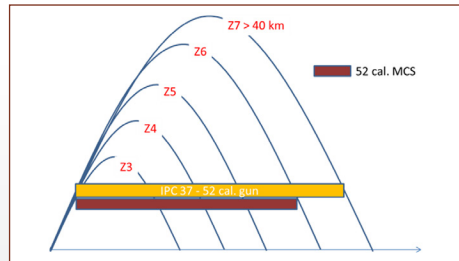
The 155mm IPC37 propelling charge is dedicated to the 155mm/52 cal. Artillery systems. It consists of a combustible case containing five bags of propellant covering the zones 3 to 7. This propelling charge offers a longer range firing capability while featuring similar ballistic characteristics with the existing modular charge systems for zones 3 to 6. It is a cheaper alternative to the modular charge systems (Top Charge Module) when the key features of the modular charge concept are not requested

### DESCRIPTION

The 155mm IPC37 propelling charge meets the ballistic requirements of the Joint Ballistic Memorandum of Understanding (JBMOU) as far as the zones 3 to 6 are concerned. This propelling charge can also be used in 39 caliber guns (limited to zone 5) & 45 caliber guns (limited to zone 6). In addition, a dedicated version for 39 caliber guns is also proposed, i.e the 155mm IPC35 propelling charge (Zone 3 to zone 5)

### TECHNICAL DATA

Type	Monolithic combustible case with 5 increments
Calibre	155mm
Total length	<780mm
Total mass	17kg
Propellant types	Multibase propellant
Igniter	Black powder



### PERFORMANCE

Maximum range (155 LU211 BB)	>40km
Operational temperature range	-33°/+63°C (firing)
Storage temperature range	-33°/+71°C

### PACKAGING

1 charge per container, 16 containers per pallet
--

### STATUS

Under development

# 155mm SUCH-7

## PROPELLING CHARGE FOR 52 CALIBRE ARTILLERY SYSTEMS



### MISSION

The 155mm SUCH-7 propelling charge is a supercharge which can be used in addition to the 155mm modular charge system. This supercharge offers an extended range capability to the 52 caliber artillery systems compared to the maximum range available with the modular charge system when fired in zone 6.

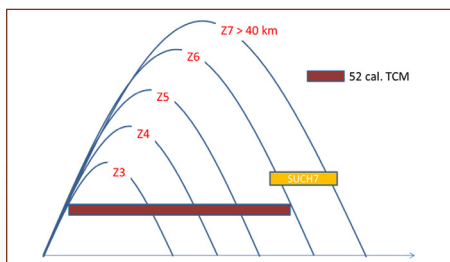
### DESCRIPTION

The 155mm SUCH-7 propelling charge is designed to be compatible with the 52 caliber gun chamber dimensions compliant with the Joint Ballistic Memorandum of Understanding

(JBMOU). It is developed to propose an extended range of about 5% compared of the maximum range available with the modular charge system when fired in zone 6.

### TECHNICAL DATA

Type	Monolithic combustible case
Calibre	155mm
Total length	<780mm
Total mass	17kg
Propellant types	Multibase propellant
Igniter	Black powder



### PERFORMANCE

Maximum range (155 LU211 BB)	>40km
Operational temperature range	-33°/+63°C (firing)
Storage temperature range	-33°/+71°C

### PACKAGING

1 charge per container, 16 containers per pallet

### STATUS

Under development

# 105mm HE HB ER G3

## 105mm NATO ARTILLERY AMMUNITION



### MISSION

The HE HB ER G3 belongs to the 105mm NATO standard shell family offering proven reliability and high terminal effectiveness. This cartridge can be fired especially by the Nexter LG 105 guns, British L119 LG guns and upgraded US M101 guns.

The HE HB ER G3 is available in two versions, one with the M67 standard propelling charge to achieve a range up to 11km and one with 2 zones propelling charge to achieve a range up to 15km.

### DESCRIPTION

This semi-fixed cartridge 105mm HE HB ER G3 (see hereafter the cartridge drawing) consists of:

- A high explosive projectile fitted with an Hollow Base
- A super-quick and delay point detonating fuze, type PD M557 or M739 (the fuze can be delivered separately)
- A cartridge case made of brass
- A percussion type primer assembly
- A propelling charge: 2 zones of propelling charge in order to fire at different muzzle velocities

### TECHNICAL DATA

Type	HE HB
Calibre	105mm
Round weight	18kg with fuze
Round length	850mm with fuze
Projectile weight	13,1kg
Explosive payload	2,5kg of Composition B
Projectile length	568mm
Base	Gaz generator
Fuze	Any 2-inch thread standard fuze
Propelling charge Priming	Approx 2,7kg of propellant and percussion primer

### PERFORMANCE

Muzzle velocity	675m/s (in LG1 gun)
Maximum range	15km (zone 2)

### PACKAGING

Several types of packaging are available depending on standards used in the various armies : individual cylindrical cardboard container, 2-round wooden crate, 12-crate

### STATUS

Qualified

# 105mm HE BB ER G3

FOR LG1 MKII 105 GUNS, BRITISH L119, US-M119 LG GUNS AND UPGRADED USM 101 GUNS



## MISSION

The HE BB ER G3 belongs to the 105mm NATO standard shell family offering proven reliability and high terminal effectiveness.

This cartridge can be fired especially by the Nexter LG105 guns, the British L119 LG guns and the upgraded US M101 guns. Fitted with a Base Bleed unit, this shell can achieve a range up to 17km

## DESCRIPTION

This semi-fixed cartridge 105mm HE BB ER G3 (see hereafter the cartridge drawing) consists of:

- A high explosive projectile fitted with a Base Bleed unit
- A super-quick and delay point detonating fuze, type PD M557 or M739 (the fuze can be delivered separately)
- A cartridge case made of brass
- A percussion type primer assembly
- A propelling charge: 2 zones of propelling charge in order to fire at different muzzle velocities

## TECHNICAL DATA

Type	HE BB
Calibre	105mm
Round weight	18kg with fuze
Round length	850mm with fuze
Projectile weight	13,1kg
Explosive payload	2,5kg of Composition B
Projectile length	568mm
Base	Gaz generator
Fuze	Any 2-inch thread standard fuze
Propelling charge Priming	Approx 2,7kg of propellant and percussion primer

## PERFORMANCE

Muzzle velocity	685m/s (in LG1 gun)
Maximum range	17km (zone 2)

## PACKAGING

Several types of packaging are available depending on standards used in the various armies : individual cylindrical cardboard container, 2-round wooden crate, 12-crate

## STATUS

In service

# 105mm L14 HE M1



## MISSION

The 105mm L14 mm HE M1 projectile is used for guarantees the support to soldiers in every situation assured by the fragmentation of the projectile body (made of high quality forged steel) and the striking blast of the explosive charge. This projectile can be fired by howitzers 105mm M56 and M2A1.

## DESCRIPTION

The explosive filled in the projectile shell may be TNT or Composition B. Projectiles may be fitted with Proximity, PD or MTSQ fuze or with a closing plug. The cartridge case contains seven numbered increment bags, tied together, in numerical order. These bags are assembled into the cartridge case, around the primer flash tube.

## TECHNICAL DATA

Type	HE
Calibre	105mm
Round mass (nominal)	18kg
Round length	790mm
Projectile mass (nominal)	14kg
Projectile length	552mm
Projectile filling (nominal)	2.10kg TNT or Comp. B
Cartridge case	Brass
Propellant SB (nominal)	1.4kg (total increments 1-7)
Fuze	PD
Primer	Percussion

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	420m/s
Maximum range	10,200m
Operational temperature	-40°C to +52°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box	
UN Classification:	1.2 E UN 0321

## STATUS

In service

# 105mm SMK BB ER G3

## 105mm NATO ARTILLERY AMMUNITION



### MISSION

The SMK BB ER G3 belongs to the 105mm NATO standard shell family offering proven reliability and high terminal effectiveness. This cartridge can be fired especially by the Nexter LG 105 guns, the British L119 LG guns and the upgraded US M101 guns. This smoke shell has a ballistic similar to its HE BB ER G3 shell counterpart. Then fitted with a Base Bleed unit, this shell can also achieve a range up to 17km. The smoke shell generates a smoke screen during 50s to 1mn 30s according to the aerological conditions.

### DESCRIPTION

The semi-fixed cartridge 105 SMK BB ER G3 consists of the following items:

- A smoke projectile fitted with a Base Bleed Unit
  - A super quick and delay point detonating fuze (1)
  - A cartridge case made of brass
  - A percussion type primer assembly
  - 2 zones of propelling charge in order to fire at different muzzle velocities
- (1) The semi-fixed cartridge can be delivered without fuze

### TECHNICAL DATA

Type	SMK BB
Calibre	105mm
Cartridge mass	18kg with fuze
Cartridge length	850mm with fuze
Projectile weight	13.1kg
Projectile weight	568mm
Payload	White phosphorous Payload (approx 2.3kg)
Gaz generator weight	0.500kg
Fuze	All NATO standard (2 inches)
Propelling charge priming	Approx 2.7kg of propellant and percussion primer

### PERFORMANCE

Muzzle velocity	685m/s (in LG1 gun)
Maximum range	17km
Duration of smoke screen	50 - 90s

### PACKAGING

One semi-fixed cartridge packaged in a Cardboard cylindrical container. 2 containers by wooden box. 12 wooden boxes by pallet

### STATUS

Qualified

# 105mm SMK HB ER G3

## 105mm NATO ARTILLERY AMMUNITION



### MISSION

The SMK HB ER G3 belongs to the 105mm NATO standard shell family offering proven reliability and high terminal effectiveness. This cartridge can be fired especially by the Nexter LG 105 guns, British L119 LG guns and upgraded US M101 guns. This smoke shell has a ballistic similar to its HE HB G3 shell counterpart.

The SMK HB ER G3 is available in two versions, one with the M67 standard propelling charge to achieve a range up to 11km and one with 2 zones propelling charge to achieve a range up to 15km.

### DESCRIPTION

The semi-fixed cartridge 105 SMK HB ER G3 consists of the following items:

- A smoke projectile fitted with an Hollow Base
  - A super quick and delay point detonating fuze (1)
  - A cartridge case made of brass
  - A percussion type primer assembly
  - 2 zones of propelling charge in order to fire at different muzzle velocities
- (1) The semi-fixed cartridge can be delivered without fuze

### TECHNICAL DATA

Type	SMK HB
Calibre	105mm
Cartridge mass	18kg with fuze
Cartridge length	850mm with fuze
Projectile weight	13.1kg
Projectile weight	568mm
Payload	White phosphorous Payload (approx 2.3kg)
Gaz generator weight	0.500kg
Fuze	All NATO standard (2 inches)
Propelling charge priming	Approx 2.7kg of propellant and percussion primer

### PERFORMANCE

Muzzle velocity	675m/s (in LG1 gun)
Maximum range	15km
Duration of smoke screen	50 - 90s

### PACKAGING

One semi-fixed cartridge packaged in a Cardboard cylindrical container. 2 containers by wooden box. 12 wooden boxes by pallet

### STATUS

Qualified

# XF<sup>®</sup>

## MELT-CAST EXPLOSIVE COMPOSITIONS FOR INSENSITIVE AMMUNITION



### MISSION

Nexter Munitions has developed several very low vulnerability melt-cast explosive compositions known as XF.

These compositions:

- Limit serious effects following an attack
- Provide enhanced safety for both personnel and equipment
- Facilitate ammunition disposal and recycling at end of life cycle
- Provide enhanced environmental protection
- Offer a low ownership cost: less storage area, less logistics requirements (Unitary Risk)

### TECHNICAL DATA

#### XF 13333 EXPLOSIVE COMPOSITION

Detonation velocity	6,976m/s
Detonation pressure	>210kbar (theoretical value)
Critical diameter	<60mm
Impact sensitivity - ISI NFT 70-500	30% Go at 50 joules
Friction sensitivity - ISF NFT 70-503	0% Go at 353N

#### XF 11585 EXPLOSIVE COMPOSITION

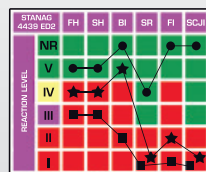
Detonation velocity	7,468m/s
Detonation pressure	242kbar (theoretical value)
Unconfined critical diameter	~10mm
Impact sensitivity - ISI NFT 70-500	30% Go at 50 joules
Friction sensitivity - ISF NFT 70-503	0% Go at 353N

### STATUS

XF 13333: Qualified and In service

XF 11585: Qualified

### LU 211 IM SIGNATURE



- TOLERATED
- FORBIDDEN
- Melt-cast XF
- ★ Cast-cured PBX
- Melt-cast TNT

# PDM 728



## MECHANICAL PD FUZE FOR ARTILLERY SHELLS



### MISSION

This fuze has been designed in order to provide Nexter Munitions customers with an optimal and improved confidence for firings in rifled artillery barrels, including latest L52 barrel generation: compatibility with the firing constraints, compatibility with the ammunition (including IM ammunition), and full compliance with the highest and latest applicable civil & military standards.

### DESCRIPTION

The PDM 728 fuze is a Point Detonating Mechanical fuze intended to all kind of HE and WP NATO ammunition (including IM shells) for 105,120-rifled mortar and 155mm barrels.

2 terminal functioning modes are available, super-quick mode which corresponds to immediate functioning at impact, or delay mode if selected before firing. The set up before firing is possible with any usual screw driver or equivalent device.

This fuze is also available for conventional artillery 52 calibre rounds in two versions PDM 727 (Super Quick & delay modes), PDM 729 (Super Quick mode).

### TECHNICAL DATA

<b>Application</b>	Artillery PD fuze
<b>Calibre</b>	120 - 105 - 155mm rifle barrels
<b>Muzzle velocity</b>	Up to 1,100m/s
<b>Safety and non-armed distance</b>	> 200m (with 155mm)
<b>Arming distance</b>	< 500m (with 155mm)
<b>Fully compliant with the latest safety standards</b>	STANAG 4187 STANAG 4157
<b>IM performances</b>	STANAG 4439 MURAT in both configurations : bare fuze and bare mounted on IM shell
<b>Reability</b>	> 98%
<b>Compliant with European Chemical Regulation (REACH)</b>	
<b>ITAR free solution</b>	

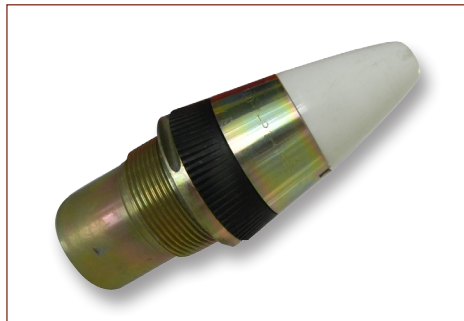
### PACKAGING

<b>Metal box M2 A1 containing 8 fuzes Wooden box containing 84 metal boxes</b>	
<b>Pallet dimensions (mm)</b>	1000 x 1200 x 820mm
<b>Weight</b>	1000kg
<b>Volume</b>	1m <sup>3</sup>

### STATUS

French MoD qualification for 155L52 and rifled 120 Mortar.  
PDM 728 selected by French MOD after evaluation tests.

# FB375



## MISSION

Proximity fuze with Height of burst function with impact back-up, impact only selectable.

## DESCRIPTION

The FB375 fuze was designed in accordance with STANAG 4187. It is a RF proximity fuze equipped with Height-of-burst sensor as well as Point Detonation and Self-destruction modes. The desired functional mode can be selected by means of a setting sleeve.

An electronic safety inhibits the proximity function before 5sec of flight. The fuze is waterproof.

## TECHNICAL DATA

Type	Electronic fuze
Compatible with 155mm L52 ammunition	
Fuze mass (nominal)	~885g
Fuze length (nominal)	i.a.w MIL-STD-333
Booster charge mass (nominal)	~9.3g of A5
Power supply	Lithium Battery

## PERFORMANCE

Functions	Proximity, height of burst, PD
Mechanical safety distance	400 calibres
Electrical safety for proximity function	5 seconds
Height of burst	10m independent from reflection coefficient
Operating temperature	-31°C to +55°C

## PACKAGING

8 fuzes per metallic container. 2 metallic box per wooden container
24 wooden containers per pallet
UN Classification: 1.2D UN 0409
Italian MOD qualification

## STATUS

In service

# FB557



## MISSION

The fuze FB557 is derived from the PD M557 fuze. It is a multipurpose fuze suitable for 76mm up to 155mm ammunition. It is a mechanical fuze with two operating mode, Super quick PD function and PD Delay function settable by means of the switch on the side of the fuze.

## DESCRIPTION

The Super Quick function mode can be selected to have detonation on the target.

The Delayed point detonation mode can be selected to assure a detonation after the target.

The delay time is 0.05sec but it can be changed during assembling if requested from the customer

## TECHNICAL DATA

Type	Mechanical fuze
<b>Compatible with 76mm up to 155mm ammunition</b>	
Fuze mass (nominal)	962g
Fuze length (nominal)	96mm (overall 152mm)
Booster charge mass (nominal)	24g of A5
Power supply	Firing force

## PERFORMANCE

Functions	PD and PD delay
Mechanical safety distance	Variable i.a.w. charge and calibre used
Minimum operating distance	Variable i.a.w. charge and calibre used
Operating temperature	-54°C to +71°C

## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# FB739A1



## MISSION

The fuze FB739A1 is derived from the PD M739 fuze. It is a multipurpose fuze suitable for 76mm up to 155mm ammunition.

## DESCRIPTION

It is a mechanical fuze with two operating mode, Super Quick PD function and PD Delay function settable by means of the switch on the side of the fuze. The difference with PD M739 is that the fuze has a very short delay of few msec using a different post impact delay assembly. The fuze has an anti storm and anti

foliage system to reduce the sensibility of impact sensor against rain and foliage.

## TECHNICAL DATA

Type	Mechanical fuze
<b>Compatible with 76mm up to 155mm ammunition</b>	
Fuze mass (nominal)	643g
Fuze length (nominal)	96mm (overall 152mm)
Booster charge mass (nominal)	22g of A5
Power supply	Firing force

## PERFORMANCE

Functions	PD and PD Delay
Mechanical safety distance	Variable i.a.w. charge and calibre used
Minimum operating distance	Variable i.a.w. charge and calibre used
Setback acceleration	30,000g max → (294,300m/s <sup>2</sup> )
Rotating spin	30,000rpm max → (3.141rad/s)
Operating temperature	-40°C to +52°C

## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

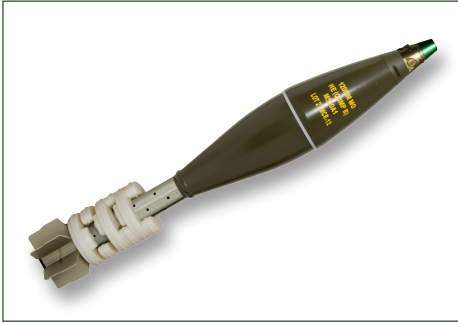


# Mortar Ammunition



# 120mm Mortar HE

## M530A1



### MISSION

The 120mm HE bomb is designed for use in 120mm smooth bore towed mortars. The round is used against structures, material and personnel targets.

### DESCRIPTION

The body is made of high fragmentation cast iron and is loaded with 2.5kg of Composition B. The fuze is a Point Detonating type that can be set in either delay or superquick mode. The standard propelling charge set consists of a primary cartridge and 6 equal charge

increments. The round has a range in excess of 7km. The 120mm M530A1 has been safety certified by the US Army in 1999.

### TECHNICAL DATA

Type	HE
Calibre	120mm
Round mass (nominal)	15.2kg
Round length	Max 780mm
Projectile filling (Comp. B)	2.5kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	311m/s
Range	>7km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

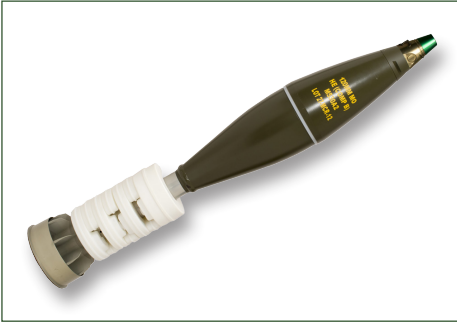
**UN Classification: 1.1 E UN 0006**

### STATUS

In service

# 120mm Mortar HE

## M530A2



### MISSION

The 120mm HE bomb is designed for use in 120mm smooth bore NEMO and other high pressure mortars. The round is used against structures, material and personnel targets.

### DESCRIPTION

The body is made of high fragmentation cast iron and is loaded with 2.5kg of Composition B. The fuze is a point detonating type that can be set in either delay or superquick mode. The standard propelling charge set consists of a primary cartridge, 6 equal charge increments

and a 7th supplementary charge. The round has a range in excess of 9km. The 120mm M530A2 is obtained by adding a stub case on the 120mm M530A1 which has been safety certified by the US Army for use in the 120mm AMS turreted mortar in 1999.

### TECHNICAL DATA

Type	HE
Calibre	120mm
Round mass (nominal)	15.5kg
Round length	800mm
Projectile filling (Comp. B)	2.5kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7S	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

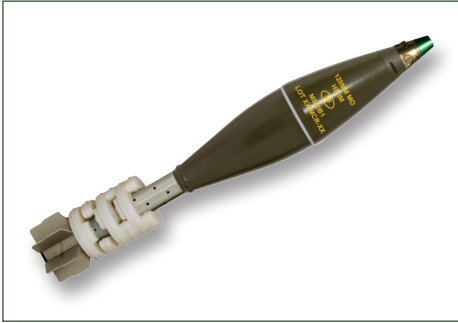
**UN Classification: 1.1 E UN 0006**

### STATUS

In service

# 120mm Mortar HE-IM

## M530B1



### MISSION

The 120mm HE bomb is designed for use in 120mm smooth bore towed mortars. The round is used against structures, material and personnel targets.

### DESCRIPTION

The body is made of high fragmentation cast iron loaded with 2.5kg of insensitive melt cast explosive (XF®11585) and is compliant with STANAG 4439. The fuze is a Point Detonating type that can be set in either delay or superquick mode. The standard propelling

charge set consists of a primary cartridge and 6 equal charge increments. The round has a range in excess of 7km. The 120mm M530B1 is an upgrade of the 120mm HE M530A1 - safety certified by the US Army in 1999 - which provides improved safety for personnel and equipments, limits the reaction created by different threats (fire, impact, ...) and has less safety constraints for logistics during the complete lifecycle of the product (storage, transport, operation).

### TECHNICAL DATA

Type	HE-IM
Calibre	120mm
Round mass (nominal)	15.2kg
Round length	Max 780mm
Projectile filling (Comp. B)	2.5kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	311m/s
Range	>7km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet. Alternative packaging available on request.

Gross weight (container)	40kg
Dimension ext (container)	970 x 400 x 185mm
Gross weight (complete pallet)	650kg
Dimension ext (complete pallet)	1200 x 1000 x 1070mm
UN Classification: under qualification	

### STATUS

Qualified

# 120mm Mortar HE-IM

## M590B2



### MISSION

The 120mm HE bomb is designed for use in 120mm smooth bore NEMO and other high pressure mortars. The round is used against structures, material and personnel targets.

### DESCRIPTION

The body is made of high fragmentation cast iron loaded with 2.5kg of insensitive melt cast explosive (XF®11585) and is compliant with STANAG 4439. The fuze is a point detonating type that can be set in either delay or superquick mode. The standard propelling

charge set consists of a primary cartridge, 6 equal charge increments and a 7th supplementary charge. The round has a range in excess of 9km. The 120mm M590B2 is an upgrade of the 120mm M590A2 design which provides improved safety for personnel and equipments, limits the reaction created by different threats (fire, impact, ...) and has less safety constraints for logistics during the complete lifecycle of the product (storage, transport, operation).

### TECHNICAL DATA

Type	HE-IM
Calibre	120mm
Round mass (nominal)	15.5kg
Round length	800mm
Projectile filling (XF®11585)	2.5kg
Fuze	PD (Delay or superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7s (For NEMO)	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Operational temperature	-46°C to +62°C

### PACKAGING

1 round per waterproof fiber container, 24 containers per pallet.

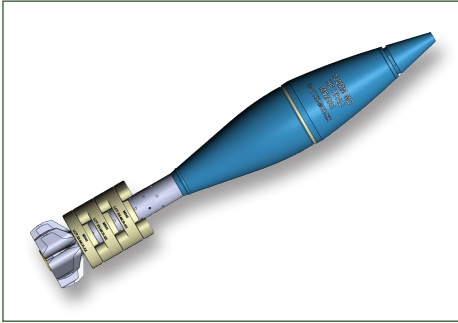
Gross weight (container)	21kg
Dimension ext (container)	980 x 180 x 180mm
Gross weight (complete pallet)	590kg
Dimension ext (complete pallet)	1200 x 1000 x 1020mm
UN Classification: Under qualification	

### STATUS

In service

# 120mm Mortar HE PRAC

## M528A1



### MISSION

The 120mm HE PRAC bomb is a fin stabilized round complete with propellant increment charges and a dummy fuze. It is designed to be used for training mortar crews and forward observers.

### DESCRIPTION

The bomb is ballistically similar to the MECAR Family of 120mm Mortar Bombs and hence fires with the exact same firing tables or computerized fire control system. It uses exactly the same propelling charge system as

the live rounds; a primary charge, and 6 equal increments (1-6).

### TECHNICAL DATA

Type	HE PRAC
Calibre	120mm
Round mass (nominal)	15.1kg
Round length	780mm
Projectile filling	XF 11585
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	311m/s
Range	>7km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

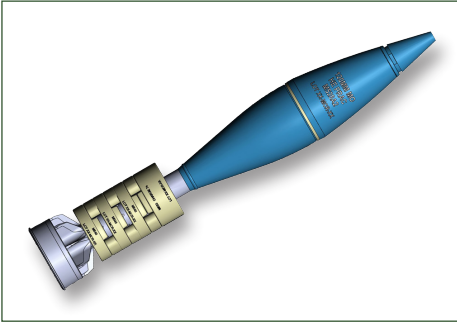
**UN Classification: 1.2 C UN 0328**

### STATUS

In service

# 120mm Mortar HE PRAC

## M528A2



### MISSION

The 120mm HE PRAC bomb is a fin stabilized round complete with propellant increment charges and a dummy fuze. It is designed to be used for training mortar crews and forward observers.

### DESCRIPTION

The bomb is ballistically similar to the MECAR Family of 120mm Mortar Bombs and hence fires with the exact same firing tables or computerized fire control system. It uses exactly the same propelling charge system as

the live rounds; a primary charge, 6 equal increments (1-6) and a 7th supplementary charge. The round has a range in excess of 9km. The 120mm M528A2 is obtained by adding a stub case on the 120mm M528A1.

### TECHNICAL DATA

Type	HE PRAC
Calibre	120mm
Round mass (nominal)	15.5kg
Round length	800mm
Projectile filling	Inert
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7S	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

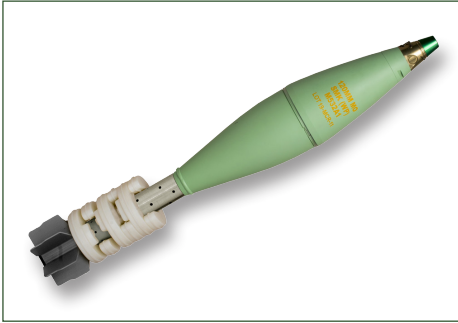
**UN Classification: 1.2 C UN 0328**

### STATUS

In service

# 120mm Mortar SMK(WP)

## M532A1



### MISSION

The 120mm SMK (WP) bomb is designed for use in 120mm smooth bore towed mortars. This round is used to produce instantaneous smoke for spotting, signalling or screening purposes, and to create an incendiary effect against material targets.

### DESCRIPTION

The body is made of high fragmentation cast iron and is loaded with 2.1kg of White Phosphorus and is fitted with a Composition B burster. The fuze is a point detonating type

that can be set in either delay or superquick mode. The standard propelling charge set consists of a primary cartridge and 6 equal charge increments. The round has a range in excess of 7km. The 120mm M532A1 has been safety certified by the US Army in 1999.

### TECHNICAL DATA

Type	SMK(WP)
Calibre	120mm
Round mass (nominal)	15.2kg
Round length	780mm
Projectile filling (White Phosphorus)	2.1kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	331m/s
Range	>7km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

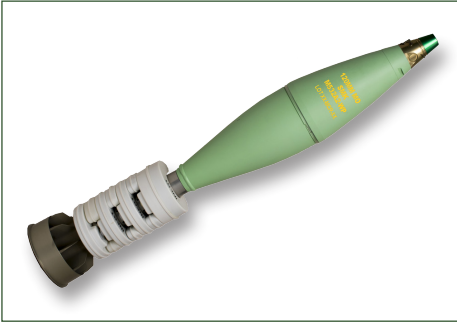
**UN Classification: 1.2 H UN 0245**

### STATUS

In service

# 120mm Mortar SMK(WP)

## M532A2-WP



### MISSION

The 120mm SMK (WP) bomb is designed for use in 120mm smooth bore NEMO and other high pressure mortars. This round is used to produce instantaneous smoke for spotting, signalling or screening purposes, and to create an incendiary effect against material targets.

### DESCRIPTION

The body is made of high fragmentation cast iron and is loaded with 2.1kg of White Phosphorus and is fitted with a composition B burster. The fuze is a point detonating type

that can be set in either delay or superquick mode. The standard propelling charge set consists of a primary cartridge, 6 equal charge increments (for use in standard towed mortars), and a 7th supplementary charge (for use in new generation of high pressure turreted mortar systems). The round has a range in excess of 9km when fired from turreted mortar systems. The 120mm M532A1 has been safety certified by the US Army for use in the 120mm AMS turreted mortar in 1999.

### TECHNICAL DATA

Type	SMK(WP)
Calibre	120mm
Round mass (nominal)	15.7kg
Round length	800mm
Projectile filling (White Phosphorus)	2.1kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7S (for AMS)	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

**UN Classification: 1.2 H UN 0245**

### STATUS

In service

# 120mm Mortar ILL

## M533A1



### MISSION

The 120mm illuminating bomb is designed for use in 120mm smooth bore towed mortars. The round is used to produce illumination of a specific point or area of operations.

### DESCRIPTION

The bomb consists of a two-piece projectile. The forward part houses the illuminating payload, while the parachute is lodged in the rear section. The bomb is fitted with a mechanical time fuze. The standard propelling charge set consists of a primary cartridge and 6 equal

charge increments. The round has a range in excess of 7km. The 120mm M533A1 has been safety certified by the US Army in 1999.

### TECHNICAL DATA

Type	ILL
Calibre	120mm
Round mass (nominal)	15.2kg
Round length	780mm
Projectile filling (Illuminating Comp.)	1.2kg
Fuze	MTSQ
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	311m/s
Range	>7km
Descent rate	4m/sec
Illuminated rate - period	Approx 50s
Illuminated rate - intensity	1.0Mcd
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

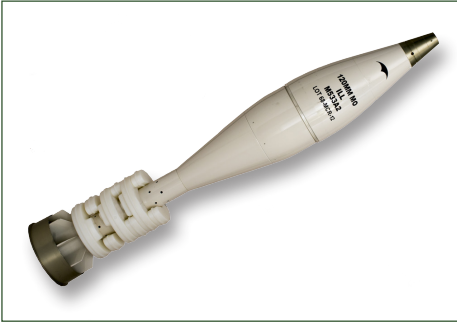
**UN Classification: 1.2 G UN 0171**

### STATUS

In service

# 120mm Mortar ILL

## M533A2



### MISSION

The 120mm illuminating bomb is designed for use in 120mm smooth bore NEMO and other high pressure mortars. The round is used to produce illumination of a specific point or area of operations.

### DESCRIPTION

The bomb consists of a two-piece projectile. The forward part houses the illuminating payload, while the parachute is lodged in the rear section. The bomb is fitted with a mechanical time fuze. The standard propelling charge set

consists of a primary cartridge, 6 equal charge increments and a 7th supplementary charge. The round has a range in excess of 9km. The 120mm M533A2 is obtained by adding a stub case on the 120mm M533A1 which has been safety certified by the US Army for use in the 120mm AMS turreted mortar in 1999

### TECHNICAL DATA

Type	ILL
Calibre	120mm
Round mass (nominal)	15.5kg
Round length	800mm
Projectile filling (Illuminating Comp.)	1.2kg
Fuze	MTSQ
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7S (for NEMO)	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Descent rate	+/-4m/sec
Illuminated rate - period	Approx 50s
Illuminated rate - intensity	1.0Mcd
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet - Alternative packaging available on request

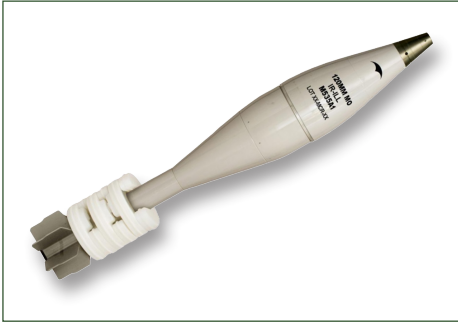
**UN Classification: 1.2 G UN 0171**

### STATUS

In service

# 120mm Mortar IR-ILL

## M535A1



### MISSION

The 120mm illuminating bomb is designed for use in 120mm smooth bore towed mortars. The round is used to produce illumination of a specific point or area of operations in the near infrared for use of night vision goggles.

### DESCRIPTION

The bomb consists of a two-piece projectile. The forward part houses the illuminating payload, while the parachute is lodged in the rear section. The bomb is fitted with a time fuze. The standard propelling charge set consists of

a primary cartridge and 6 equal charge increments. The round has a range in excess of 7km. The infrared illuminating composition is visible in the IR spectrum from 0.7 to 1.2 microns with a minimal signature in the visible spectrum. The pyrotechnic composition is REACH compliant.

### TECHNICAL DATA

Type	IR-ILL
Calibre	120mm
Round mass (nominal)	15.2kg
Round length	780mm
Projectile filling (Illuminating Comp.)	1.2kg
Fuze	TSQ
Primary ignition cartridge	M547
Increment charge 1 to 6	M546

### PERFORMANCE

Maximum chamber pressure at 21°C	95MPa
Muzzle velocity	311m/s
Range	>7km
Descent rate	+/- 4m/s
Infrared band	0,7-1,2µm
Illuminated temperature	approx. 50s
Operational temperature	-46°C to +62°C

### PACKAGING

2 rounds per twin container, 15 containers per pallet. Alternative packaging available on request.

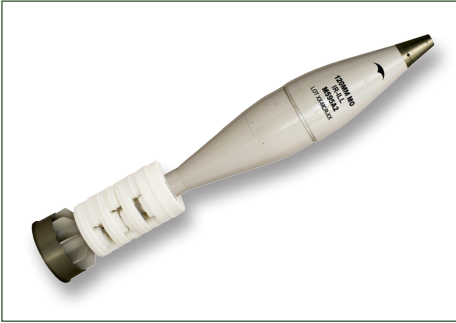
Gross weight (container)	40kg
Dimension ext (container)	970 x 400 x 185mm
Gross weight (complete pallet)	635kg
Dimension ext (complete pallet)	1200 x 1000 x 1070mm
UN Classification: 1.2 G UN 0171	

### STATUS

Qualified

# 120mm Mortar IR-ILL

## M595A2



### MISSION

The 120mm infrared-illuminating bomb is designed for use in 120mm smooth bore NEMO and other high pressure mortars. The round is used to produce illumination of a specific point or area of operations in the near infrared for use of night vision goggles.

### DESCRIPTION

The bomb consists of a two-piece projectile. The forward part houses the IR-illuminating payload, while the parachute is lodged in the rear section. The bomb is fitted with a time

fuze. The standard propelling charge set consists of a primary cartridge, 6 equal charge increments and a 7th supplementary charge. The round has a range in excess of 9km. The infrared illuminating composition is visible in the IR spectrum from 0.7 to 1.2 microns with a minimal signature in the visible spectrum. The pyrotechnic composition is REACH compliant.

### TECHNICAL DATA

Type	IR-ILL
Calibre	120mm
Round mass (nominal)	15.5kg
Round length	800mm
Projectile filling (Illuminating Comp.)	1.2kg
Fuze	TSQ
Primary ignition cartridge	M547
Increment charge 1 to 6	M546
Supplementary charge 7s (For NEMO)	M553

### PERFORMANCE

Maximum chamber pressure at 21°C	165MPa
Muzzle velocity	440m/s
Range	>9km
Descent rate	+/- 4m/s
Infrared band	0,7-1,2µm
Illuminated temperature	approx. 50s
Operational temperature	-46°C to +62°C

### PACKAGING

1 round per waterproof fiber container, 24 containers per pallet.

Gross weight (container)	21kg
Dimension ext (container)	980 x 180 x 180mm
Gross weight (complete pallet)	590kg
Dimension ext (complete pallet)	1200 x 1000 x 1020mm
UN Classification: 1.2 G UN 0171	

### STATUS

Qualified

# 120mm Mortar Bomb HE-PD IM238

Mortar Ammunition



## MISSION

This mortar bomb is a high explosive indirect fire ammunition, effective against light structures, non-armoured assets and infantry troops, due to its natural fragmentation and blast.

## DESCRIPTION

The HE-PD mortar bomb consists of a steel body filled with high explosive and a nose point-detonating fuze.

The body is loaded with TNT explosive. The tail assembly is fitted with the ignition cartridge

and the « horse-shoe » type propellant increments. The charge system consists of one primary cartridge fitted in the tail and up to seven horse-shoe increments fitted around the tail.

The maximum number of propellant increments depends on the mortar model.

## TECHNICAL DATA

Type	HE
Calibre	120mm
Bomb mass (nominal)	13kg
Bomb length (nominal)	658mm
Fuze mass (nominal)	0.208kg
Bomb length without fuze (nominal)	598mm
Bomb filling (nominal)	2.5kg TNT
Fuze	Point Detonating
Propellant	from 1 to 7 propellant increments

## PERFORMANCE

Maximum range	6,840m
Operational temperature	-40°C to +63°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box
<b>UN Classification: 1.1E UN 0006</b>

## STATUS

In service

# 120mm Mortar Bomb TP SIL344



## MISSION

This mortar bomb is designed to be used for training. It has the same ballistic, weight and dimension characteristics of the HE version.

## DESCRIPTION

The TP mortar bomb consists of a steel body fitted with dummy fuze.

The tail assembly is fitted with the ignition cartridge and the « horse-shoe » type propellant increments.

The charge system consists of one primary cartridge fitted in the tail and up to seven

horse-shoe increments fitted around the tail.

The maximum number of propellant increments depends on the mortar model.

## TECHNICAL DATA

Type	TP
Calibre	120mm
Bomb mass (nominal)	13kg
Bomb length (nominal)	658mm
Bomb length without fuze (nominal)	598mm
Fuze	Dummy fuze
Propellant	from 1 to 7 propellant increments

## PERFORMANCE

Maximum range	6,840m
Operational temperature	-40°C to +63°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box

UN Classification: 2C UN 0328

## STATUS

In service

# 81mm Mortar HE LR

## M512A1



### MISSION

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), to produce blast and fragmentation effects when used against structures, material targets and personnel.

### DESCRIPTION

The round consists of a high fragmentation nodular cast iron bomb body with a plastic obturator, a nose fuze and an aluminium tail assembly. The body is loaded with Composition B explosive. The tail assembly is fitted with the

ignition cartridge and the "horse-shoe" type charge increments (2 for low pressure, 4 for medium pressure and 5 for high pressure mortars).

### TECHNICAL DATA

Type	HE
Calibre	81mm
Round mass (nominal)	4.2kg
Round length	510mm
Projectile filling (Comp. B)	0.8kg
Fuze	PD
Primary ignition cartridge	M563
Charge increments *	2 or 4 increments type - M565
Supercharge **	1 increment type - M565

\* Charge configuration in accordance to Client's requirements

\*\* Supercharge can be provided separately

### PERFORMANCE

Range (low pressure mortar)	100 to 2,500m
Range (medium pressure mortar)	100 to 4,500m
Range (high pressure mortar)	100 to 5,500m
Lethal radius	>22m
Operational temperature	-32°C to +62°C

### PACKAGING

3 rounds per container, 36 containers per pallet

UN Classification: 1.1 E UN 0006

### STATUS

In service

# 81mm Mortar HE-IM LR

## M512B1



### MISSION

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), to produce blast and fragmentation effects when used against structures, material targets and personnel.

### DESCRIPTION

The round consists of a high fragmentation nodular cast iron bomb body with a plastic obturator, a nose fuze and an aluminium tail assembly. The body is loaded with 800g of insensitive melt cast explosive (XF®11585) and is compliant with

STANAG 4439. The tail assembly is fitted with the ignition cartridge and the "horse-shoe" type charge increments (2 for low pressure, 4 for medium pressure and 5 for high pressure mortars). The 81mm M512B1 is an upgrade of the 81mm M512A1 design which provides improved safety for personnel and equipments, limits the reaction created by different threats (fire, impact, ...) and has less safety constraints for logistics during the complete lifecycle of the product (storage, transport, operation).

### TECHNICAL DATA

Type	HE-IM
Calibre	81mm
Round mass (nominal)	4.2kg
Round length	510mm
Projectile filling (Comp. B)	0.8kg
Fuze	PD
Primary ignition cartridge	M563
Charge increments *	2 or 4 increments type - M565
Supercharge **	1 increment type - M565

\* Charge configuration in accordance to Client's requirements

\*\* Supercharge can be provided separately

### PERFORMANCE

Range (low pressure mortar)	100 to 2,500m
Range (medium pressure mortar)	100 to 4,500m
Range (high pressure mortar)	100 to 5,500m
Lethal radius	>22m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per reusable waterproof polymer container

3 containers per transit wooden box. 8 wooden boxes per pallet

Gross weight (container)	46kg
Dimension ext (container)	780 x 400 x 300mm
Gross weight (complete pallet)	410kg
Dimension ext (complete pallet)	1550 x 800 x 720mm
UN Classification: Under qualification	

### STATUS

In development

# 81mm Mortar SMK(WP)

## M513A1



### MISSION

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), to produce instant white smoke for spotting, signalling or screening purposes and to produce an incendiary effect against material targets.

### DESCRIPTION

The round consists of a nodular cast iron bomb body with a plastic obturator, a nose fuze and an aluminium tail assembly. The bomb is loaded with a white phosphorus smoke

composition and has a centrally mounted explosive burster. The tail assembly is fitted with the ignition cartridge and the "horse-shoe" type charge increments (2 for low pressure, 4 for medium pressure and 5 for high pressure mortars).

### TECHNICAL DATA

Type	SMK(WP)
Calibre	81mm
Round mass (nominal)	4.3kg
Round length	510mm
Projectile filling (White Phosphorus)	650g
Fuze	PD
Primary ignition cartridge	M563
Charge increments *	2 or 4 increments type - M565
Supercharge **	1 increment type - M565

\* Charge configuration in accordance to Client's requirements

\*\* Supercharge can be provided separately

### PERFORMANCE

Range (low pressure mortar)	100 to 2,500m
Range (medium pressure mortar)	100 to 4,500m
Range (high pressure mortar)	100 to 5,500m
Operational temperature	-32°C to +62°C

### PACKAGING

3 rounds per container, 36 containers per pallet

**UN Classification: 1.2 H UN 0243**

### STATUS

In service

# 81mm Mortar ILL LR

## M515A1



### MISSION

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), for the illumination of a specific point or area of operations.

### DESCRIPTION

The round consists of a tubular steel bomb body and tail cone with a plastic obturating band, a time fuze and an aluminium tail assembly. It contains a black powder expelling charge, the illuminating flare and parachute. The tail assembly is fitted with the ignition cartridge

and the "horse-shoe" type charge increments (2 for low pressure, 4 for medium pressure and 5 for high pressure mortars).

### TECHNICAL DATA

Type	Illuminating
Calibre	81mm
Round mass (nominal)	4.4kg
Round length	630mm
Projectile filling (Illuminating Comp)	700g
Fuze	TSQ
Primary ignition cartridge	M564
Charge increments *	2 or 4 increments type - M566
Supercharge **	1 increment type - M566

\* Charge configuration in accordance to Client's requirements

### PERFORMANCE

Range (low pressure mortar)	250 to 2,050m
Range (medium pressure mortar)	250 to 3,450m
Range (high pressure mortar)	250 to 4,050m
Brust height	600m
Descent rate	4m/s
Illuminated rate	Period: approx. 55s Intensity: 600000cd
Operational temperature	-32°C to +62°C

### PACKAGING

3 rounds per container, 36 containers per pallet

Gross weight (container)	18kg
Dimension ext (container)	710 x 330 x 120mm
Gross weight (complete pallet)	675kg
Dimension ext (complete pallet)	1400 x 1000 x 840mm
UN Classification: 1.3 G UN 0254	

### STATUS

In service

# 81mm Mortar IR-ILL LR

## M466



### MISSION

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), for the illumination of a specific point or area of operations in the near infrared for use of night vision goggles.

### DESCRIPTION

The round consists of a tubular steel bomb body and tail cone with a plastic obturating band, a time fuze and an aluminium tail assembly. It contains a black powder expelling charge, the illuminating flare and parachute. The tail

assembly is fitted with the ignition cartridge and the "horse-shoe" type charge increments (2 for low pressure, 4 for medium pressure and 5 for high pressure mortars). The infrared illuminating composition is visible in the IR spectrum from 0.7 to 1.2 microns with a minimal signature in the visible spectrum. The pyrotechnic composition is REACH compliant.

### TECHNICAL DATA

Type	IR-ILL
Calibre	81mm
Round mass (nominal)	4,4kg
Round length	630mm
Projectile filling (Illuminating Comp)	700g
Fuze	TSQ
Primary ignition cartridge	M564
Charge increments *	2 or 4 increments type - M566
Supercharge **	1 increment type - M566

\* Charge configuration in accordance to Client's requirements

### PERFORMANCEPERFORMANCE

Range (low pressure mortar)	250 to 2,050m
Range (medium pressure mortar)	250 to 3,450m
Range (high pressure mortar)	250 to 4,050m
Descent rate	4m/s
Infrared band	0,7-1,2µm
Illuminated rate period	approx. 55s
Operational temperature	-46°C to +62°C

### PACKAGING

3 rounds per container, 36 containers per pallet

Gross weight (container)	18kg
Dimension ext (container)	710 x 330 x 120mm
Gross weight (complete pallet)	675kg
Dimension ext (complete pallet)	1400 x 1000 x 840mm
UN Classification: 1.3 G UN 0254	

### STATUS

In development

# 81mm Mortar HE-TP LR

**M572A1**

**MISSION**

For use with low, medium and high pressure 81mm mortars (M1, M29/M29A1, M252/L16A1 and equivalents), to train mortar crews and forward observers.

**DESCRIPTION**

The HE-TP round is ballistically similar to the HE round and hence fires with the same firing tables. It uses the same propelling charge system as the live rounds. The tail assembly is fitted with the ignition cartridge and the "horse-shoe" type charge increments (2 for low

pressure, 4 for medium pressure and 5 for high pressure mortars). On impact the Point Detonating fuze functions causing a pyrotechnic charge to ignite which yields a spotting flash and a bang similar to live HE bomb while greatly reducing risks from fragmentation and blast effects.

**TECHNICAL DATA**

Type	HE-TP
Calibre	81mm
Round mass (nominal)	4.2kg
Round length	513mm
Projectile filling	Inert
Fuze	PD
Primary ignition cartridge	M563
Charge increments *	2 or 4 increments type - M565
Supercharge **	1 increment type - M565

\* Charge configuration in accordance to Client's requirements

\*\* Supercharge can be provided separately

**PERFORMANCE**

Range (low pressure mortar)	100 to 2,500m
Range (medium pressure mortar)	100 to 4,500m
Range (high pressure mortar)	100 to 5,500m
Operational temperature	-32°C to +62°C

**PACKAGING**

3 rounds per container, 36 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

**STATUS**

In service

# 81mm Mortar Bomb HE SIL446



## MISSION

This mortar bomb is a high explosive indirect fire ammunition, effective against light structures, vehicles, non-armoured assets and infantry troops, due to its natural fragmentation and blast. 81mm HE Mortar Bomb is a High Explosive round developed to be used with M1, M29, M252, L16, 81-MX2-KM Mortar Systems, or equivalent.

## DESCRIPTION

The round consists of a high fragmentation nodular cast iron bomb body with a plastic obturator, a nose point-detonating fuze and an aluminium tail assembly. The bomb is loaded with Composition B, the tail is fitted with an ignition primer and the augmenting charges. The charge system consists of one primary cartridge fitted in the tail and up to six horseshoe increments fitted around the tail. The maximum number of propellant increments depends on the mortar model.

## TECHNICAL DATA

Type	Mortar Bomb HE
Calibre	81mm
Bomb mass (nominal)	4.15kg
Bomb length	515mm
Fuze mass (nominal)	0.230kg
Bomb filling (nominal)	0.830kg Comp B
Fuze	Point Detonating
Propellant	from 1 to 6 propellant increments

\* Charge configuration in accordance to Client's requirements.

## PERFORMANCE

Maximum range Operational temperature	6,900m
Operational temperature	from -46°C to +63°C
Lethal radius	>22m

## PACKAGING

3 rounds per container, 36 containers per pallet or in accordance with Client's requirements

**UN Classification: 1.1 E UN 0006**

## STATUS

In service

# 81mm Mortar Bomb ILL



## MISSION

This Mortar Bomb is an Illuminating round developed to be used in the L16 Mortar Systems, or equivalent and is used for illuminating a desired area. The 81mm illuminating Mortar Bomb is in service in the Armed Forces of different countries e.g. UK Army, and remains at the forefront of operational requirements. The burn time gives troops ample opportunity to illuminate and spot hostile forces.

## DESCRIPTION

The round consists of a tubular steel body and tail cone with a plastic obturating band, a mechanical time fuze and an aluminium tail assembly. It contains an expelling charge (black powder), the illuminating canister and parachute. The tail assembly is fitted with the ignition primer and the augmenting charges.

## TECHNICAL DATA

Type	ILL
Calibre	81mm
Round mass (nominal)	4.5kg
Round length	650mm
Bomb filling (Illuminating Comp.)	Illuminating
Fuze	Mechanical time
Augmenting Charge *	Max 6 augmenting charges

\* Charge configuration in accordance to Client's requirements

## PERFORMANCE

Range (High Pressure Mortar)	4,800m
Burst height	500m
Descent rate	≤7m/s
Illuminating rate - period	>30s
Illuminating rate - intensity	900kcd
Operational temperature	-46°C to +63°C

## PACKAGING

Two (2) rounds for container, 2 containers per metal box, 32 metal box per pallet or in accordance to Client's requirements

**UN Classification: 1.2 G UN 0171**

## STATUS

In service

# 81mm Mortar Bomb ILL SIL447

Mortar Ammunition



## MISSION

This Mortar Bomb is used for illuminating a desired area, developed to be used with 81-MX2-KM Mortar Systems, or equivalent. The burn time gives troops ample opportunity to illumine and spot hostile forces.

## DESCRIPTION

The round consists of a tubular steel body and tail cone with a plastic obturating band, a mechanical time fuze and an aluminium tail assembly. It contains an expelling charge

(black powder), the illuminating canister and a parachute.

The charge system consists of one primary cartridge fitted in the tail and up to six horseshoe increments fitted around the tail. The maximum number of propellant increments depends on the mortar model.

ILL IR version is also available.

## TECHNICAL DATA

Type	Mortar Bomb ILL
Calibre	81mm
Bomb mass (nominal)	4,5kg
Bomb length (nominal)	650mm
Bomb filling	Illuminating composition
Fuze	Mechanical time
Propellant	From 1 to 6 propellant increments

\* Charge configuration in accordance to Client's requirements

## PERFORMANCE

Range (High Pressure Mortar)	6,900m
Burst height	500m
Descent rate	≤7m/s
Illuminating rate - period	>30s
Illuminating rate - intensity	900kcd
Operational temperature	From -46°C to +63°C

## PACKAGING

3 rounds per container, 36 containers per pallet or in accordance with Client's requirements.

**UN Classification: 1.2 G UN 0171**

## STATUS

In production

# 81mm Mortar Bomb IR-ILL



## MISSION

This Mortar Bomb is an Infrared Illuminating bomb developed to be used in the L16 Mortar Systems, or equivalent. The Infrared Illuminating Bomb represents a major step forward for 81mm mortar system technology. The IR technology allows troops in the field to greatly enhanced visibility for night time operations and allows friendly forces to effectively observe the environment through night vision equipment.

## DESCRIPTION

The round consists of a tubular steel body and tail cone with a plastic obturating band, a mechanical time fuze and an aluminium tail assembly. It contains a expelling charge (black powder), the illuminating canister and parachute. The tail assembly is fixed with the ignition primer and the augmenting charges.

## TECHNICAL DATA

Type	IR (Infrared Illuminating)
Calibre	81mm
Round mass	4.5kg
Round length	650mm
Bomb filling (Illuminating Comp.)	IR (Infrared)
Fuze	Mechanical time
Augmenting Charge *	Max 6 augmenting charges

\* Charge configuration in accordance to Client's requirements

## PERFORMANCE

Range (High Pressure Mortar)	4,800m
Burst height	500m
Descent rate	≤7m/s
Illuminating rate - period	≥50s
Illuminating rate - intensity	250W/Steradians
Operational temperature	-46°C to +63°C

## PACKAGING

2 rounds for container, 2 containers per metal box, 32 metal box per pallet or in accordance to Client's requirements

**UN Classification: 1.2 G UN 0171**

## STATUS

In service

# 60mm Mortar HE LR

## M710



### MISSION

For use with long range and light weight (commando type) 60mm mortars (M19, M224 and equivalents), to produce blast and fragmentation effects when used against structures, material targets and personnel.

### DESCRIPTION

The round consists of a high fragmentation cast iron bomb body loaded with Composition B. The bomb body is fitted with a plastic obturator, a nose fuze and an aluminium tail assembly. The tail assembly contains the ignition cartridge

and the “horse-shoe” type charge increments. The M710-2 has 2 increments for use in M19 type mortars. The M710-4 has 4 increments for use in M224 type mortars. The M710-5 has an additional increment to obtain maximum range in the M224 mortar.

### TECHNICAL DATA

Type	HE
Calibre	60mm
Round mass (nominal)	1.8kg
Round length	375mm
Projectile filling (Comp. B)	0.25kg
Fuze	PD SQ
Primary ignition cartridge	M705
Charge increments	2, 4 or 5 horseshoes - M706

### PERFORMANCE

Muzzle safety	>40m
Range (Charge 0-5 in M224)	70 to 4,000m
Range (Charge 0-4 in M224)	70 to 3,500m
Range (Charge 0-2 in M19)	70 to 2,150m
Lethal radius	>16m
Operational temperature	-32°C to +62°C

### PACKAGING

1 round per container, 2 containers per wooden box

### STATUS

Under development

# 60mm Mortar SMK(WP)

## M711



### MISSION

For use with long range and light weight (commando type) 60mm mortars (M19, M224 and equivalents), to release instant white smoke for spotting, signalling or screening purposes and to produce an incendiary effect against material targets.

### DESCRIPTION

The round consists of a nodular cast iron bomb body with a plastic obturator, a nose fuze and an aluminium tail assembly. The bomb is loaded with White Phosphorus and has a centrally

oriented high explosive burster. The tail assembly contains the ignition cartridge and the “horse-shoe” type charge increments. The M711-2 has 2 increments for use with M19 type mortars. The M711-4 has 4 increments for use with M224 type mortars. The M711-5 has an additional increment to obtain maximum range in the M224 mortar.

### TECHNICAL DATA

Type	SMK(WP)
Calibre	60mm
Round mass (nominal)	1.8kg
Round length	375mm
Projectile filling (Comp. B)	0.25kg
Fuze	PD (Delay or Superquick)
Primary ignition cartridge	M705
Charge increments	2, 4 or 5 horseshoes - M706

### PERFORMANCE

Muzzle safety	>40m
Range (Charge 0-5 in M224)	70 to 4,000m
Range (Charge 0-4 in M224)	70 to 3,500m
Range (Charge 0-2 in M19)	70 to 2,150m
Operational temperature	-32°C to +62°C

### PACKAGING

1 round per container, 2 containers per wooden box

### STATUS

Under development

# 60mm Mortar ILL

## M712



### MISSION

For use with low and high pressure 60mm mortars (M19, M224 and equivalents), for the illumination of a specific point or area of operations.

### DESCRIPTION

The round consists of a tubular steel bomb body with a plastic obturating band, a mechanical time fuze, a tail cone and aluminium tail assembly. It is loaded with the illuminating flare/parachute assembly and a Black Powder expelling charge. The tail assembly contains the

ignition cartridge and "horse-shoe" type increment charges. The M712-2 has 2 increments for use in M19 type mortars. The M712-4 has 4 increments for use in M224 type mortars.

### TECHNICAL DATA

Type	ILL
Calibre	60mm
Round mass (nominal)	1.9kg
Round length	390mm
Projectile filling	Parachute, illuminating flare
Fuze	MTSQ
Primary ignition cartridge	M705
Charge increments	2 or 4 horseshoes - M706

### PERFORMANCE

Muzzle safety	>40m
Range (Charge 0-4 in M224)	70 to 3,500m
Range (Charge 0-2 in M19)	70 to 2,150m
Burst height	500m
Descent rate	4m/sec
Illuminated rate - period	30s
Illuminated rate - intensity	400,000cd
Operational temperature	-32°C to +62°C

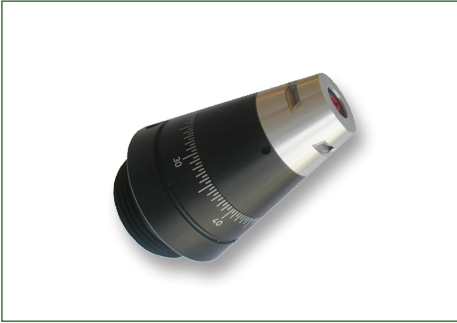
### PACKAGING

1 round per container, 2 containers per wooden box

### STATUS

Under development

# FB652



## MISSION

The FB 652 is a dual-safety mechanical time fuze designed to be used on 60mm, 81mm and 120mm illuminating mortar rounds.

## DESCRIPTION

The FB 652 is a derivative of the FB650 with the addition of a second safety feature for compliance with STANAG 4187. The fuze contains a highly accurate clockwork mechanism, which can be set manually for a time delay between 6 and 54 seconds with steps of 0,5 seconds.

A dual safety device requires the combination of 1 second time elapsed after launch, and the spin of an air-activated nose flywheel to provide armament.

The fuze features a standard 1.5" thread in accordance to the figure 5 of Mil-Std-333.

## TECHNICAL DATA

Type	Mechanical fuze
Calibre	60mm, 81mm, 120mm ILL Mortar Bombs
Fuze mass (nominal)	210g
Fuze length (nominal)	120mm (overall 248mm)
Booster charge mass (nominal)	3g of Black powder
Power supply	Mechanical energy

## PERFORMANCE

Functions	Time
Mechanical safety distance	1s
Minimum operating distance	6s
Operating temperature	-46°C to +63°C

## PACKAGING

50 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# FB650



## MISSION

The FB 650 is a mechanical time fuze designed to be used on 60mm, 81mm and 120mm illuminating mortar rounds.

## DESCRIPTION

The fuze contains a highly accurate clockwork mechanism, which can be set manually for a time delay between 6 and 54 seconds with steps of 0,5 seconds.

A safety device delays the armament of the fuze by 1" so ensuring the necessary safety distance.

The fuze features a standard 1.5" thread in accordance to the figure 5 of Mil-Std-333.

## TECHNICAL DATA

Type	Mechanical time fuze
Calibre	60mm, 81mm, 120mm ILL Mortar Bombs
Fuze mass (nominal)	210g
Fuze length (nominal)	120mm (overall 248mm)
Booster charge mass (nominal)	3g of Black powder
Power supply	Mechanical energy

## PERFORMANCE

Functions	Time
Mechanical safety distance	1s
Minimum operating distance	6s
Operating temperature	-46°C to +63°C

## PACKAGING

50 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service



# Tank Ammunition



# 120mm HE F1

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm HE F1 belongs to an ammunition family complying with STANAG 4385 and Mopi AEP 26 requirements and can be fired by the Leclerc, Abrams M1 (A1 and A2), Leopard 2, C1 Ariete and other MBTs fitted a 120mm smoothbore gun. The 120mm HE F1 is designed to defeat reinforced concrete structures, light armoured vehicles and personnel in the open field thanks to its capability of functioning at high grazing incidence (88,5°). The family of ammunition consists of combat rounds (120 APFSDS armour piercing round, 120 HE High Explosive round, 120mm CAN) and practice rounds (120 APFSDS-TP

practice armour piercing round and 120 HEAT-TP practice anti-tank round) and drill rounds for tank crew training for ammunition handling.

### DESCRIPTION

The Cartridge 120mm HE F1 is a high explosive round with tracer and consists of a projectile, a propelling charge assembly, and a point-detonating (PD) fuze. The propulsion system consists of a metallic stub case with a combustible cartridge case, granular propellant and an electric semi-combustible primer. The projectile is based on a forged steel body filled with explosive. A fin tail assembly with 6 deployable fins, is fixed on the shell body.

### TECHNICAL DATA

Type	High explosive munition
Calibre	120mm
Round mass	27kg
Round length	945mm
Projectile mass	16.8kg
Propellant	Single Base
Cartridge case	Combustible
Fuze	Point detonating Super Quick, 2 independentsafety devices compliant with STANAG 4187
Primer	Semi-combustible, Electrical primer
Projectile type	HE SQ
Explosive mass	3kg
Type of explosive	Compo B

### PERFORMANCE

Range	4,000m
Muzzle velocity (+21°C)	1,050m/s (52 cal.)
Precision/Dispersion	<0,35mil @ 2,500m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 120mm HE IM3M

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm HE IM3M (Insensitive Munition with 3 functioning Modes) belongs to an ammunition family complying with STANAG 4385 and MOPI AEP26 requirements. It can be fired by the Leclerc MBT and other MBT's fitted with a 120mm smoothbore gun. The 120mm HE IM3M is a high explosive round equipped with a multimode fuze programmable for impact, delay time or airbursting modes. Its multimode capability enables the projectile to defeat a large spectrum of targets: light armoured vehicles, dismounted troops, protected combat group in urban or

landscape battlefields, hidden targets, bunkers. In addition 120mm HE IM3M is an insensitive 120mm high explosive ammunition compliant with STANAG 4439.

### DESCRIPTION

The Cartridge 120mm HE IM3M is an insensitive high explosive round with tracer and consists of a projectile, and a propelling charge assembly. The propulsion system consists of a metallic stub case with combustible cartridge case, LOVA propellant and electric semi-combustible primer. The projectile is based on a forged steel body, with reinforced ogive filled with insensitive explosive, and a multimode programmable base fuze. A fin tail assembly with 6 deployable fins, is fixed on the shell body.

### TECHNICAL DATA

Type	High explosive munition, Multimode munition
Calibre	120mm
Round mass	28kg
Round length	945mm
Projectile mass	18kg
Propellant	Insensitive (LOVA)
Cartridge case	Combustible
Fuze	Multimode Base Detonating and Programmable
Fuze modes	Super Quick - Delay - Airburst, Compliant with STANAG 4187
Primer	Semi-combustible, Electrical primer
Projectile filling	HE IM
Projectile type	IM HE, SQ/AB/Delay
Type of explosive	Insensitive HE, composition "XF"

### PERFORMANCE

Range	4,000m
Muzzle velocity (+21°C)	1,050m/s (52 cal.)
Precision/Dispersion	<0,35mil @ 2,500m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

Under development

# 120mm APFSDS F1B

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm APFSDS F1B (Armour Piercing Fin Stabilized Discarding Sabot) belongs to an ammunition family complying with STANAG 4385 and MOPI AEP 26 requirements and can be fired by the Leclerc, Abrams M1 (A1 and A2), Leopard 2, C1 Ariete and other MBTs fitted a 120mm smoothbore gun.

The 120mm APFSDS F1B is designed to defeat heavy armoured vehicles such as MBT's.

The family of ammunition consists of combat rounds (120 APFSDS armour piercing round, 120 HE High Explosive round, 120mm CAN)

and practice rounds (120 APFSDS-TP practice armour piercing round and 120 HEAT-TP practice anti-tank round) and drill rounds for tank crew training for ammunition handling.

### DESCRIPTION

The 120mm APFSDS F1B is a Kinetic Energy round consisting of an assembly of a propelling charge and a projectile with Tungsten penetrator.

The propulsion system consists of a metallic stub case with combustible cartridge case, granular propellant and electric semi-combustible primer. The projectile is based on a tungsten penetrator equipped with a six blades fin assembled in a 3 part-sabot. A ballistic cap is fitted to the front of the penetrator. The sabot has a silicone rubber seal at the rear to prevent gas leakage.

### TECHNICAL DATA

Type	Armour Piercing Fin - Stabilized Discarding Sabot
Calibre	120mm
Round mass	19.6kg
Round length	984mm
Projectile mass	7.3kg
Cartridge case	Combustible
Propellant	Double base
Primer	Semi-combustible, Electrical primer

### PERFORMANCE

Range	4,000m
Muzzle velocity (+21°C)	1,790m/s (52 cal.)
Precision/Dispersion	<0,20mil @ 3,000m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 120mm CAN

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm CAN (Canister), with the design based on GD-OTS' M1028 projectile, belongs to an ammunition family complying with all the STANAG 4385 and MOPI AEP 26 requirements and can be fired by the LECLERC, Abrams M1 (A1 and A2), Leopard 2, C1 Ariete and other MBTs fitted with a 120mm smoothbore gun.

The 120mm CAN provides the Main Battle Tanks crews with a very effective close -defense solution against various threats in urban or battlefields, while limiting collateral damages. The family of ammunition consists of

combat rounds (120 APFSDS armour piercing round, 120 HE High Explosive round, 120mm CAN) and practice rounds (120 APFSDS-TP practice armour piercing round and 120 HEAT-TP practice anti-tank round) and drill rounds for tank crew training for ammunition handling.

### DESCRIPTION

The 120mm CAN consists in a projectile containing Tungsten spheres stacked into an aluminum shell body, a propelling charge assembly. The propulsion system consists in a metallic stub case with combustible cartridge case, granular propellant and electric semi-combustible primer.

### TECHNICAL DATA

Type	Canister
Calibre	120mm
Round mass (nominal)	22.5kg
Round length	761mm
Projectile mass (nominal)	11.5kg
Projectile filling	1 100 approx, Tungsten Spheres
Cartridge case	Combustible
Primer	Semi-combustible, Electrical primer
Propellant	Double Base

### PERFORMANCE

Muzzle velocity	1 410m/s approx
Maximum range	500m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 120mm HEAT-TP F1A

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm HEAT-TP F1A (Training Practice) belongs to an ammunition family complying with STANAG 4385 and MOPI AEP 26 requirements and can be fired by the Leclerc, Abrams M1 (A1 and A2), Leopard 2, C1 Ariete and other MBTs fitted a 120mm smoothbore gun.

The 120mm HEAT-TP is designed for Training purposes of the MBT's crews.

The family of ammunition consists of combat rounds (120 APFSDS armour piercing round, 120 HE High Explosive round, 120mm CAN)

and practice rounds (120 APFSDS-TP practice armour piercing round and 120 HEAT-TP practice anti-tank round) and drill rounds for tank crew training for ammunition handling.

### DESCRIPTION

The 120mm HEAT-TP F1A is a training round consisting in an assembly of a propelling charge and of an inert projectile with a tracer. The propulsion system consists in a metallic stub case with a combustible cartridge case, granular propellant and an electric semi-combustible primer. The projectile consists of an inert steel shell body with a spike. A fin tail assembly, fitted with a tracer, is fixed on the shell body.

### TECHNICAL DATA

Type	Training practice
Calibre	120mm
Round mass	24.3kg
Round length	983mm
Projectile mass	14.4kg
Cartridge case	Combustible
Propellant	Single base
Projectile type	Inert
Primer	Semi-combustible, Electrical primer

### PERFORMANCE

Range	2,500m
Muzzle velocity (+21°C)	1,100m/s (52 cal.)
Precision/Dispersion	<0,25mil @ 2,000m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 120mm APFSDS-TP

## 120mm AMMUNITION FOR NATO GUNS



### MISSION

The 120mm APFSDS-TP (Armour Piercing Fin Stabilized Discarding Sabot - Training Practice) belongs to an ammunition family complying with STANAG 4385 and MOPI AEP 26 requirements and can be fired by the Leclerc, Abrams M1 (A1 and A2), Leopard 2, C1 Ariete and other MBT's fitted a 120mm smoothbore gun.

The 120mm APFSDS-TP is a kinetic energy, target practice round designed to simulate a Kinetic Energy round gun firing effect, but at reduced maximum ranges to allow training firings on short ranges proving grounds and training areas.

The family of ammunition consists of combat rounds (120 APFSDS armour piercing round, 120 HE High Explosive round, 120mm CAN) and practice rounds (120 APFSDS-TP practice armour piercing round and 120 HEAT-TP practice anti-tank round) and drill rounds for tank crew training for ammunition handling.

### DESCRIPTION

The 120mm APFSDS-TP is a training round consisting in an assembly of a propelling charge and of a projectile with a tracer. The propulsion system consists in a metallic stub case with a combustible cartridge case, granular propellant and an electric semi-combustible primer. The projectile consists in a one-piece steel rod with a tail cone assembly including a tracer, which is fixed into a 3-parts sabot. Reduced range is achieved by the aerodynamic blocking effect of slots located on the tail cone.

### TECHNICAL DATA

Type	Training practice
Calibre	120mm
Round mass	18kg
Round length	900mm
Projectile mass	6.1kg
Cartridge case	Combustible
Propellant	Single base
Projectile type	Inert
Primer	Electrical semi-combustible primer

### PERFORMANCE

Range	3,000m
Muzzle velocity (+21°C)	1,750m/s (52 cal.)
Precision/Dispersion	<0,25mil @ 2,500m
Operational temperature	-31°C to +51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 115mm TK APFSDS-T

## M1150



### MISSION

For use with 115mm tank guns, to defeat armoured targets by means of the kinetic energy (KE) of its tungsten alloy long rod penetrator.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium

Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with a percussion primer and a wear reducing liner.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	115mm
Round mass (nominal)	25kg
Round length	1110mm
Projectile mass (nominal)	6.5kg
Penetrator	Tungsten alloy
Tracer	M21
Anti-wear additive	Titanium dioxide
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	8.5kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1635m/s
Dispersion	0.3 Mills
Line of sight penetration (RHA at 2,000m & 60° obliquity)	>500mm
Operational temperature	-32°C to +52°C

### PACKAGING

1 round per container, 2 containers per wooden box
12 wooden boxes per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK SMK (WP)-T

## M416A1



### MISSION

For use with 105mm US M68, UK L7 and other Stanag 4458 compliant tank guns, to provide spotting, signalling, or screening smoke and incendiary effects against structures and material targets.

### DESCRIPTION

The projectile comprises a thin walled, steel cylindrical body with two driving bands and a base plug which is fitted with a base detonating fuze and an external tracer. It is loaded with White Phosphorus (WP) and has a centrally

positioned composition A5 burster. The projectile is assembled to a brass cartridge case fitted with an electric primer and loaded with a cool burning, single base, multi-perforated, bagged propelling charge.

### TECHNICAL DATA

Type	Fixed round SMK(WP)-T
Calibre	105mm
Round mass (nominal)	20.9kg
Round length	940mm
Projectile mass (nominal)	11.6kg
Projectile filling (White Phosphorus)	2.6kg
Fuze - BD	M10504
Tracer	M12
Cartridge case	Brass
Primer	Electric cap M120
Propellant SB (nominal)	3,3kg
NSN	1315-00-901-4921

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	731.5m/s
Maximum range	9,150m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 H UN 0245</b>

### STATUS

In service

# 105mm TK HESH-TP-T

## M467A1-E



### MISSION

For use with 105mm US M68, UK L7 and other Stanag 4458 compliant tank guns, to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

This round is similar in appearance and ballistically to the HESH-T (HEP-T) M393 family of ammunition. The projectile comprises a steel cylindrical body fitted with two driving bands, and a base plug to which is secured a tracer. The projectile is assembled to a brass cartridge

case, which is fitted with an electric primer and loaded with a cool burning, single base multi-perforated bagged type propelling charge. This round is based on the MECAR M467A1 round, that was type classified by the US Army.

### TECHNICAL DATA

Type	Fixed round HESH-TP-T
Calibre	105mm
Round mass (nominal)	20.6kg
Round length	940mm
Projectile mass (nominal)	11.3kg
Tracer	M12
Cartridge case	Brass
Primer	Electric cap M120
Propellant SB (nominal)	2.9kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	730m/s
Dispersion	0.31 Mils
Maximum range	9,510m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK HE

## M1010



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to provide blast and fragmentation effect against equipment, structures and personnel.

### DESCRIPTION

The steel bodied projectile, loaded with a 2.0kg high explosive charge, is fitted with a gilding metal driving band and a Point Detonating impact fuze. The projectile is assembled to a brass or steel cartridge case, which is fitted with an electric primer and loaded with a cool

burning, single base, multi-perforated propellant. The fuze has two independent in-bore safeties and complies with MIL-STD-1316.

Please note that a new round is under development for the CMI CT-CV turret.

### TECHNICAL DATA

Type	Fixed round HE
Calibre	105mm
Round mass (nominal)	23kg
Round length	998mm
Projectile mass (nominal)	12.1kg
Projectile (Explosive content)	2.0kg
Fuze	PD
Cartridge case	Brass
Primer	Electric cap M83
Propellant SB (nominal)	3.0kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	700m/s
Maximum range (42° elevation)	12,930m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

Under development

# 105mm TK HEP-IM-T

## M393B3-E



### MISSION

For use with 105mm tank guns US M68 and UK L7 to defeat reinforced concrete structures, bunkers, light armoured vehicles and personnel targets.

### DESCRIPTION

The HEP-IM-T (HESH-IM-T) projectile consists of a thin walled steel cylindrical body with two driving bands, a relatively short ogive and a base plug to which is secured the dual safety base detonating fuze and a tracer. The warhead is loaded with insensitive pressed explosive (P16945) and is compliant with STANAG 4439. The projectile is

assembled to a brass cartridge case fitted with an electric primer and loaded with a cool burning, single base, multi perforated, bagged type propelling charge. This round is an upgrade of the MECAR M393A3 design, that was type classified by the US Army in 2004, which provides improved safety for personnel and equipments, limits the reaction created by different threats (fire, impact, ...) and has less safety constraints for logistics during the complete lifecycle of the product (storage, transport, operation).

### TECHNICAL DATA

Type	Fixed round, HEP-IM-T (HESH-IM-T)
Calibre	105mm
Round mass (nominal)	20.9kg
Round length	940mm
Projectile mass (nominal)	11.5kg
Projectile filling (P16945)	3.3kg
Fuze -BD	M10503
Tracer	M12
Cartridge case	Brass
Primer	Electric cap M120
Propellant (SB) (nominal)	2.9kg
NSN	1315-00-728-0704

### PERFORMANCE

Muzzle velocity (at 21°C) (nominal)	731.5m/s
Dispersion	0.3 Mills
Maximum range	9510m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container, 12 containers per pallet.

Gross weight (twin container)	53kg
Dimension ext (twin container)	1100 x 410 x 200mm
Gross weight (complete pallet)	710kg
Dimension ext (complete pallet)	1220 x 1095 x 910mm
UN Classification: Under qualification	

### STATUS

Qualified

# 105mm TK HESH-T

**M393A3-E**

**MISSION**

For use with 105mm US M68, UK L7 and other Stanag 4458 compliant tank guns, to defeat reinforced concrete structures, bunkers, light armoured vehicles and personnel targets.

**DESCRIPTION**

The HESH-T (HEP-T) projectile consists of a thin walled steel cylindrical body with two driving bands, a relatively short ogive and a base plug to which is secured the dual safety base detonating fuze and a tracer. It is loaded with Composition A3 explosive. The projectile is

assembled to a brass cartridge case fitted with an electric primer and loaded with a cool burning, single base, multi perforated, bagged type propelling charge. This round is based on the MECAR M393A3 round, that was type classified by the US Army in 2004.

**TECHNICAL DATA**

Type	Fixed round HESH-T(HEP-T)
Calibre	105mm
Round mass (nominal)	20.6kg
Round length	940mm
Projectile mass (nominal)	11.2kg
Projectile filling (Comp B)	3.0kg
Fuze - BD	M10503
Tracer	M12
Cartridge case	Brass
Primer	Electric cap M120
Propellant SB (nominal)	2.9kg
NSN	1315-00-728-0704

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	731.5m/s
Dispersion	0.3 Mils
Maximum range	9,510m
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

**STATUS**

In service

# 105mm TK HEAT-TP-T

## M490A1



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

This round is similar in appearance and ballistically to the MECAR M1061A1 and to the US M456 Series service rounds. The inert, steel bodied projectile is fitted with a polymer obturating band, a steel standoff spike, a tail fin assembly and a tracer. The projectile is

assembled to a brass cartridge case, which is filled with triple base propellant and fitted with an electric primer.

### TECHNICAL DATA

Type	Fixed round HEAT-TP-T
Calibre	105mm
Round mass (nominal)	22.2kg
Round length	995mm
Projectile mass (nominal)	10.5kg
Projectile	Inert
Tracer	M13
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M83
Propellant TB (nominal)	5.3kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,173m/s
Dispersion	0.3 Mills
Maximum range	8,200m
Operational temperature	-32°C to +52°C

### PACKAGING

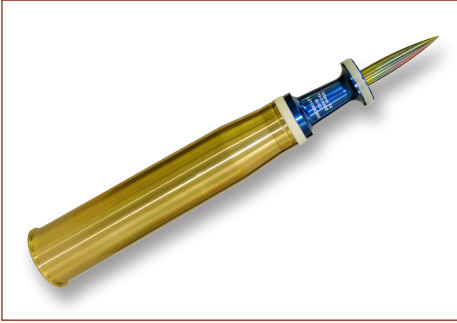
2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK TPFSDS-T

## M1056



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises a Fin Stabilized steel rod and a tracer assembled in the fin assembly. The sub-projectile is contained in a 3-piece aluminium Discarding Sabot, held in place with a polymer band at the

forward end and a polymer obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case, which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with an electric primer and a wear reducing liner. This round is similar, in appearance and ballistically to the MECAR 105mm APFSDS-T M1060A2/A3 rounds as well as most other existing APFSDS-T rounds, up to a range of 2.5km.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	105mm
Round mass (nominal)	17.5kg
Round length	962mm
Projectile mass (nominal)	5.2kg
Projectile	Steel
Tracer	M13
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M120
Propellant (nominal)	5.6kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,505m/s
Dispersion	0.32 Mils
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK TPCSDS-T

**M1057**

**MISSION**

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to provide cost effective marksmanship and live fire training of gun crews.

**DESCRIPTION**

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises a Cone Stabilized steel rod and a tracer assembled in the cone assembly. The sub-projectile is contained in a 3-piece aluminium discarding Sabot, held in place with a polymer band at the forward end and a polymer obturating band at

the rear end of the sabot. The projectile is crimped to the cartridge case, which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with an electric primer and a wear reducing liner. This round is similar, in appearance and ballistically to the MECAR 105mm APFSDS-T M1060A2/A3 rounds as well as most other existing APFSDS-T rounds, up to a range of 2.5km. The Cone Tail design ensures that the maximum range of the projectile is less than 10km.

**TECHNICAL DATA**

Type	Fixed round TPCSDS-T
Calibre	105mm
Round mass (nominal)	17.3kg
Round length	962mm
Projectile mass (nominal)	5.2kg
Projectile	Steel
Tracer	M13
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M120
Propellant (nominal)	5.6kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	1,475m/s*
Dispersion	0.3 Mills
Maximum range	<10km
Operational temperature	-32°C to +52°C

\* Velocity can be adjusted to provide ballistic match to APFSDS-T round.

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

**STATUS**

In service

# 105mm TK APFSDS-T

## M1060A2



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to defeat armoured targets by means of the kinetic energy (KE) of its monobloc tungsten alloy long rod penetrator. This model of KE round is a major product improvement of the MECAR 105mm APFSDS-T M1060A1.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the lined, brass cartridge case which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with an electric primer and a wear reducing liner.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	105mm
Round mass (nominal)	18.5kg
Round length	990mm
Projectile mass (nominal)	6.2kg
Penetrator	Tungsten alloy
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M83
Propellant (nominal)	5.9kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,460m/s
Dispersion	0.25 Mils
Line of sight penetration (RHA at 2,000 & 60° obliquity)	440mm
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK APFSDS-T

## M1060A3



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to defeat armoured targets by means of the kinetic energy (KE) of its monobloc tungsten alloy long rod penetrator. This model of KE round is a major product improvement of the MECAR 105mm APFSDS-T M1060A2.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with an electric primer and a wear reducing liner.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	105mm
Round mass (nominal)	18.7kg
Round length	1000mm
Projectile mass (nominal)	6.2kg
Penetrator	Tungsten alloy
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M83
Propellant (nominal)	6.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,560m/s
Dispersion	0.25 Mils
Line of sight penetration (RHA at 2,000 & 60° obliquity)	>500mm
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm TK HEAT-MP-T

**M1061A1**

**MISSION**

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to defeat armoured targets and structures by means of its shaped charge effect and personnel with blast and fragmentation effect.

**DESCRIPTION**

The steel bodied projectile is fitted with a polymer obturating band, a stand-off spike assembly, a tail fin assembly, and a tracer. It is equipped with a dual safety Point Impact Base Detonating (PIBD) fuze, which complies

with Mil-Std-1316. It has a high explosive shaped charge with a copper liner. The projectile is assembled to a brass cartridge case which is filled with triple base propellant and fitted with an electric primer. This round is based on the US 105mm M456 series and is similar in appearance and ballistically.

**TECHNICAL DATA**

Type	Fixed round HEAT-MP-T
Calibre	105mm
Round mass (nominal)	22.2kg
Round length	992mm
Projectile mass (nominal)	10.5kg
Projectile filling (Comp B)	1.1kg
Fuze	PIBD
Tracer	M13
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Electric cap M83
Propellant TB (nominal)	5.3kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	1,173m/s
Dispersion	0.3 Mils
Maximum range	8,200m
Penetration (at operational ranges)	>NATO Single Heavy
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

**STATUS**

In service

# 105mm TK Canister

## M1204



### MISSION

For use with 105mm US M68, UK L7, CN105F1 and other Stanag 4458 compliant tank guns, to defeat massed infantry attack and to break up infantry concentrations and personnel in dense foliage. This round is particularly effective in the anti-ambush role.

### DESCRIPTION

The M1204 CANISTER is a fixed round with the projectile crimped into a brass cartridge case. The projectile is loaded with steel spheres which are dispersed when the projectile exits

the gun barrel. The cartridge case contains a propelling charge which is initiated by an electric M120 type primer.

### TECHNICAL DATA

Type	Fixed round Canister
Calibre	105mm
Round mass (nominal)	19.5kg
Round length	880mm
Projectile mass (nominal)	8.3kg
Fragments (Ø11mm steel spheres)	+/- 1,130 spheres
Fragments weight	6.3kg
Anti-wear additive	Titanium dioxide
Primer	Electric cap M120
Propellant TB (nominal)	5.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,173m/s
Effective range	200m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 105mm L51 HEAT-T



## MISSION

The Simmel Difesa 105mm L51mm HEAT-T cartridge ensure the maximum reliability, accuracy and lethality.

Its penetration capability is greater than the standard HEAT-T M456A1 ammunition.

The HEAT-T is a dual-purpose ammunition, effective against medium-armored vehicles due to a unique shaped charge and against infantry due to its natural fragmentation and blast.

## DESCRIPTION

The steel body projectile is fitted with a plastic obturator, a threaded standoff spike assembly,

a fin and boom assembly, and a point initiating base-detonating fuze. A copper liner within the body shapes the explosive charge of Composition B. A piezoelectric element retained in a nose cap is fitted to the spike assembly and is connected to the base detonating fuze in the body. The fin is fitted with a tracer.

The projectile is assembled to a brass cartridge case which is filled with triple a base propellant and fitted with an electric primer.

## TECHNICAL DATA

Type	Fixed round HEAT-T
Calibre	105mm
Round mass (nominal)	22.1kg
Round length	992mm
Projectile mass (nominal)	10.25kg
Projectile filling (Comp B)	0.75kg
Fuze	PIBD
Tracer	M13
Cartridge case	Brass
Primer	Electric
Propellant TB (nominal)	5.45kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	1,173m/s
Dispersion	0.24Mils horizontal - 0.20Mils vertical
Maximum range	8,200m
Penetration (at operational ranges)	> than the standard M456A1 model
Operational temperature	-40°C to +52°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box

UN Classification: 1.1 E UN 0006

## STATUS

In service

# 105mm L51 HEP-T (HESH-T)



## MISSION

The Simmel Difesa 105mm L51mm HEP-T cartridge is designed to be used against armoured targets, light materiel and personnel.

## DESCRIPTION

The HEP-T (HESH-T) projectile consists of a steel cylindrical body fitted with BD (Base Detonating) fuze and a tracer is secured.

The projectile is loaded with a high explosive charge of Composition A3.

The projectile is assembled to a brass (or steel) cartridge case fitted with an electric primer and

containing a bagged propelling charge.

## TECHNICAL DATA

Type	Fixed round HEP-T (HESH-T)
Calibre	105mm
Round mass (nominal)	20.5kg
Round length	938mm
Projectile mass (nominal)	11.35kg
Projectile filling (Comp A3)	3.0kg
Fuze	BD
Tracer	M12
Cartridge case	Brass
Primer	Electric
Propellant SB (nominal)	2.7kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	731m/s
Dispersion	0.3 Mils
Maximum range	9,510m
Operational temperature	-40°C to +52°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box

UN Classification: 1.1E UN 0006

## STATUS

In service

# 105mm L51 TP-T



## MISSION

The 105mm L51 TP-T ammunition with dummy fuze is a training round. It has the same internal and external ballistics behaviour of the HEAT-T ammunition.

## DESCRIPTION

The cartridge is similar in external appearance to the HEAT-T.

The inert projectile, fitted with a tracer, is assembled to a brass cartridge case which is filled with a triple base propellant and fitted with an electric primer.

## TECHNICAL DATA

Type	Fixed round TP-T
Calibre	105mm
Round mass (nominal)	21.5kg
Round length	999mm
Projectile mass (nominal)	10.25kg
Projectile filling	Inert
Tracer	M13
Cartridge case	Brass
Primer	Electric
Propellant TB (nominal)	5.44kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	1,125m/s
Dispersion	0.3 Mils
Maximum range	8,200m
Operational temperature	-40°C to +52°C

## PACKAGING

1 round per fiber container, 2 containers per wooden box

UN Classification: 1.2 C UN 0328

## STATUS

In service

# 105mm HE F3B

## 105MM AMMUNITION FOR AMX-10 RC GUN



### MISSION

Nexter Munitions offers a range of combat and training ammunition intended for the 105mm F2 gun fitted to the AMX-10RC and RCR reconnaissance vehicle.

The 105mm HE F3B provides blast and fragmentation for use against light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with explosive, a tracer, a tail fin assembly and a PD

fuze. The projectile is mounted on a brass cartridge case which is filled with double base propellant and fitted with a primer.

### TECHNICAL DATA

Type	Combat
Calibre	105mm
Round mass	14.2kg
Round length	892mm
Projectile mass	7.2kg
Projectile filling	High Explosive
Projectile type	HE
Explosive mass	1.7kg
Type of explosive	HT
Cartridge case	Brass
Propellant	Double base
Type of fuze	Point detonating, Super Quick
Primer	Electrical primer

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	800m/s
Range	>3,000m
Precision/dispersion	<0.40mil
Safety distance	12m
Operational temperature	-31°C to 51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 105mm HEAT F3B

## 105mm AMMUNITION FOR AMX-10 RC GUN



### MISSION

Nexter Munitions offers a range of combat and training ammunition intended for the 105mm F2 gun fitted to the AMX-10RC and RCR reconnaissance vehicle.

The 105mm HEAT F3B defeats armoured targets and structures by means of its shaped charge effect.

### DESCRIPTION

A High Explosive, Anti-Tank round, with a nose cone, a body, a tail fin, assembly and a tracer. The body is filled with high explosive and is

fitted with a copper liner and a Base Detonating fuze. The fuze has a nose switch. The projectile is mounted on a brass cartridge case which is filled with single base propellant and fitted with a primer.

### TECHNICAL DATA

Type	Combat
Calibre	105mm
Round mass	13.7kg
Round length	842mm
Projectile mass	5.7kg
Projectile filling	Shaped charge
Projectile type	HEAT
Explosive mass	0.9kg
Type of explosive	HT
Cartridge case	Brass
Propellant	Single base
Type of fuze	Point detonating, base fuze
Primer	Electrical primer

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,120m/s
Range	>1,700m
Precision/dispersion	<0.40mil
Safety distance	6m
Operational temperature	-31°C to 51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 105mm APFSDS F3

## 105mm AMMUNITION FOR AMX-10 RC GUN



### MISSION

Nexter Munitions offers a range of combat and training ammunition intended for the 105mm F2 gun fitted to the AMX-10RC and RCR reconnaissance vehicle.

The 105mm APFSDS F3 defeats armoured targets, including multi plate spaced armour, using the kinetic energy of the tungsten alloy long rod penetrator.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour

Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to cartridge case which is loaded with propellant.

### TECHNICAL DATA

Type	Combat
Calibre	105mm
Round mass	13kg
Round length	884mm
Projectile mass	3.8kg
Projectile type	Tungsten penetrator
Cartridge case	Steel
Propellant	Single base
Prime	Electrical primer

### PERFORMANCES

Muzzle velocity (at + 21°C) (nominal)	1400m/s
Range	>2000m
Precision/dispersion	<0,25mil
Operational temperature	-31°C to + 51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 105mm HEAT-TP F3A

## 105mm AMMUNITION FOR AMX-10 RC GUN



### MISSION

Nexter Munitions offers a range of combat and training ammunition intended for the 105mm F2 gun fitted to the AMX-10RC and RCR reconnaissance vehicle.

The 105mm HEAT-TP F3A is used for training purpose.

### DESCRIPTION

A High Explosive, Anti-Tank Training Practice round, with an inert warhead, and fitted with a tail fin assembly and tracer. it is mounted on a brass cartridge case, uses single base propellant

and is fitted with a primer. The round is designed to match the ballistics of the in-service HEAT F3B round.

### TECHNICAL DATA

Type	Combat
Calibre	105mm
Round mass	13.7kg
Round length	842mm
Projectile mass	5.7kg
Projectile filling	Inert
Projectile type	HEAT-TP
Cartridge case	Brass
Propellant	Single base
Primer	Electrical primer

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,120m/s
Range	>1,500m
Precision/dispersion	<0.40mil
Operational temperature	-31°C to 51°C

### PACKAGING

Box	Plastic container
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### STATUS

In service

# 100mm TK APFSDS-T

## M1000A1



### MISSION

For use with 100mm tank guns - D10T-2S, D10-S, D10T and variants, as fitted to the Russian T54 & T55 and the Chinese Type 69 tanks, to defeat armoured targets.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium

Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant, and is fitted with a mechanical primer and a wear reducing liner.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	100mm
Round mass (nominal)	21kg
Round length	1064mm
Projectile mass (nominal)	5.0kg
Penetrator	Tungsten alloy
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Percussion cap
Propellant TB (nominal)	8kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1 475m/s
Effective range	3,000m
Penetration (at 1.000m)	380mm RHA
Operational temperature	-32°C to +52°C

### STATUS

Qualified

# 90mm MK8 APFSDS-T

## M690A1



### MISSION

For use with the CMI 90mm MKVIII gun to defeat armoured targets by means of the kinetic energy (KE) of its monobloc tungsten alloy long rod penetrator.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium

Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant and a wear reducing liner. The round has been US Army Safety Certified in December 2002.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	90mm
Round mass (nominal)	12.5kg
Round length	977mm
Projectile mass (nominal)	3.6kg
Penetrator	Tungsten alloy
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Percussion cap M61
Propellant (nominal)	3.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1330m/s
Dispersion	0.32 Mils
Defeats 150mm target at 60° (NATO HEAVY TARGET)	2,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm MK8 HESH-IM-T

## M691B2



### MISSION

For use with the CMI 90mm MKVIII gun, to defeat reinforced concrete structures, bunkers, light armoured vehicles and personnel targets.

### DESCRIPTION

The HESH-IM-T (HEP-IM-T) projectile consists of a thin walled steel cylindrical body with a driving band, a relatively short ogive and a base plug to which is secured the dual safety base detonating fuze and a tracer. The warhead is loaded with insensitive pressed explosive (P16945) and is compliant with STANAG 4439.

The projectile is assembled to a brass cartridge case loaded with a cool burning, single base, multi perforated, bagged type propelling charge. This round is an upgrade of the 90mm MK8 HESH-T M691A2, US Army Safety Certified in December 2002 which provides improved safety for personnel and equipments, limits the reaction created by different threats (fire, impact, ...) and has less safety constraints for logistics during the complete lifecycle of the product (storage, transport, operation).

### TECHNICAL DATA

Type	Fixed round, HESH-IM-T
Calibre	90mm
Round mass (nominal)	14.7kg
Round length	948mm
Projectile mass (nominal)	8.0kg
Projectile filling (P16945)	2.2kg
Fuze	BD/Graze
Tracer	M12
Cartridge case	Brass
Primer	Percussion cap M61
Propellan (SB) (nominal)	1.8kg

### PERFORMANCE

Muzzle velocity (at 21°C) (nominal)	712m/s
Dispersion	0.42 Mils
Defeats	US Army HEL Bunker & 8" Double Reinf. Concrete Wall
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container, 12 containers per pallet.

Gross weight (twin container)	40kg
Dimension ext (twin container)	1100 x 410 x 200mm
Gross weight (complete pallet)	520kg
Dimension ext (complete pallet)	1220 x 1100 x 910mm
UN Classification: Under qualification	

### STATUS

Qualified

# 90mm MK8 HESH-T

## M691A2



### MISSION

For use with the CMI 90mm MKVIII gun, to defeat reinforced concrete structures, bunkers, light armoured vehicles and personnel targets.

### DESCRIPTION

The HESH-T (HEP-T) projectile consists of a thin walled steel cylindrical body with a driving band, a relatively short ogive and a base plug to which is secured the dual safety base detonating fuze and a tracer. It is loaded with Composition A3 explosive. The projectile is assembled to a brass cartridge case loaded with

a cool burning, single base, multi-perforated, bagged type propelling charge. The round has been US Army Safety Certified in December 2002.

### TECHNICAL DATA

Type	Fixed round HESH-T
Calibre	90mm
Round mass (nominal)	14.4kg
Round length	948mm
Projectile mass (nominal)	7.7kg
Projectile filling (comp A3)	1.9kg
Fuze	BD/Graze
Tracer	M12
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.8kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	712m/s
Dispersion	0.42 Mils
Defeats	US Army HEL Bunker & 8" Double Reinf Concrete Wall
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm MK8 HESH-TP-T

## M692A2



### MISSION

For use with the CMI 90mm MKVIII gun, to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

This round is similar in appearance and ballistically similar to the HESH-T M691A2 service round. The projectile comprises a steel cylindrical body fitted with a driving band, and a base plug to which is secured a tracer. The projectile is assembled to a brass cartridge case loaded with a cool burning, single base

multi-perforated bagged type propelling charge. The round has been US Army Safety Certified in December 2002.

### TECHNICAL DATA

Type	Fixed round HESH-TP-T
Calibre	90mm
Round mass (nominal)	13.7kg
Round length	948mm
Projectile mass (nominal)	7.5kg
Tracer	M12
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.8kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	709m/s
Dispersion	0.42 Mils
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm MK8 SMK(WP)-T

**M693A2**



## MISSION

For use with the CMI 90mm MKVIII gun for screening, signalling or target spotting purposes as well as for its incendiary effects against structures and material targets.

## DESCRIPTION

The projectile comprises a thin walled, steel cylindrical body with a driving band and a base plug which is fitted with a base detonating fuze and an external tracer. It is loaded with White Phosphorus (WP) and has a centrally positioned composition B5 burster. The projectile is

assembled to a brass cartridge case loaded with a cool burning, single base, multi-perforated, bagged type propelling charge.

It is ballistically similar to the HESH-T M691A2 and the HESH-TP-T M692A2 rounds.

## TECHNICAL DATA

Type	Fixed round SMK(WP)-T
Calibre	90mm
Round mass (nominal)	14.4kg
Round length	948mm
Projectile mass (nominal)	7.7kg
Projectile filling (White Phosphorus)	1.3kg
Tracer	M12
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.6kg

## PERFORMANCE

Muzzle velocity (at 21°) (nominal)	709m/s
Dispersion	0.42 Mils
Operational temperature	-32°C to +62°C

## PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 H UN 0243</b>

## STATUS

In service

# 90mm MK8 TPFSDS-T

## M697A1



### MISSION

For use with the 90mm MKVIII gun, to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

A Training Practice round, consisting of a steel penetrator, an aluminium alloy fin assembly and tracer, and a three-piece aluminium alloy sabot. The round is assembled to a brass cartridge case, which is filled with cool burning, multi-perforated, loose propellant, and is fitted with a wear reducing liner. The round is ballistically

matched to the M690A1 APFSDS-T round.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	90mm
Round mass (nominal)	11.5kg
Round length	956mm
Projectile mass (nominal)	3.2kg
Penetrator	Steel
Tracer	M24
Cartridge case	Brass
Wear reducing liner	Titanium dioxide
Primer	Percussion cap M61
Propellant TB (nominal)	3.6kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1360m/s
Dispersion	0.32 Mils
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm MK3 HE-T

## M616



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns to provide blast and fragmentation for use against light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with Composition B explosive, a tracer, a tail fin assembly and a mechanical PD fuze. The fuze has one mechanical safety and an additional transport safety cap. The projectile is mounted

on a brass cartridge case which is filled with single base propellant and fitted with a mechanical primer.

**OPTION:** A delay mode can be added to the current fuze.

### TECHNICAL DATA

Type	Fixed round HE-T
Calibre	90mm
Round mass (nominal)	9.0kg
Round length	611mm
Projectile mass (nominal)	5.1kg
Projectile filling (Comp B)	1.1kg
Fuze	PDM
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	714m/s
Dispersion	0.5 Mils
Operational range	800mm
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm MK3 HE-T

## M616A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns to provide blast and fragmentation for use against light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with Composition B explosive, a tracer, a tail fin assembly and a mechanical PD fuze. The fuze has two independent arming mechanisms and is compliant with STANAG 4187. The projectile

is mounted on a brass cartridge case which is filled with single base propellant and fitted with a mechanical primer.

**OPTION:** A delay mode can be added to the current fuze.

### TECHNICAL DATA

Type	Fixed round HE-T
Calibre	90mm
Round mass (nominal)	9.0kg
Round length	611mm
Projectile mass (nominal)	5.1kg
Projectile filling (Comp B)	1.1kg
Fuze	EPD
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	714m/s
Dispersion	0.5 Mills
Operational range	800m
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm MK3 SMK(WP)-T

## M618A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns for screening, signalling or target spotting purposes as well as for its incendiary effects.

### DESCRIPTION

The round consist of a steel body filled with White Phosphorus and fitted with an explosive burster charge, a tracer, a tail fin assembly and an electronic PD and Graze fuze. The fuze has two independent safeties, and complies with Stanag 4187 and Mil-Std-1316. The projectile

is mounted on a brass cartridge case which is filled with single base propellant and fitted with a mechanical primer. Ballistically similar to the HE-T M616A1 round.

### TECHNICAL DATA

Type	Fixed round SMK(WP)-T
Calibre	90mm
Round mass (nominal)	9.1kg
Round length	623mm
Projectile mass (nominal)	5.3kg
Projectile filling (White Phosphorus)	0.9kg
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	714m/s
Dispersion	0.5 Mills
Operational range	800m
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 H UN 0243</b>

### STATUS

In service

# 90mm MK3 HEAT-T

## M620A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns to defeat armoured targets and structures by means of its shaped charge effect.

### DESCRIPTION

A High Explosive Anti-Tank round, with a nose cone, a body, a tail fin assembly and a tracer. The body is filled with high explosive and is fitted with a copper liner and an electronic Base Detonating fuze with two independent in-bore safeties. The fuze also functions in graze

impact mode and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge case which is filled with single base propellant and fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round HEAT-T
Calibre	90mm
Round mass (nominal)	8.4kg
Round length	685mm
Projectile mass (nominal)	4.1kg
Projectile filling (Octol)	560g
Fuze	Electronic PIBD
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	890m/s
Dispersion	0.5 Mils
Effective range	1,500m
Penetration	250mm RHA
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm MK3 HEAT-TP-T

## M623A2



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns for gunnery training.

### DESCRIPTION

A High Explosive Anti-Tank Training Practice round, with an inert warhead, and fitted with a tail fin assembly and a tracer. It is mounted on a brass cartridge case, uses single base propellant and is fitted with a mechanical primer.

The round is designed to match the ballistics of the in-service HEAT-T M620A1 round.

### TECHNICAL DATA

Type	Fixed round HEAT-TP-T
Calibre	90mm
Round mass (nominal)	8.4kg
Round length	667mm
Projectile mass (nominal)	4.1kg
Projectile	Inert
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	890m/s
Dispersion	0.5 Mils
Effective range	1,500m
Operational temperature	-32°C to +52°C

### PACKAGING

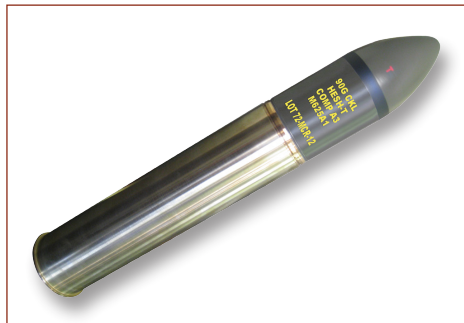
2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm MK3 HESH-T

## M625A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns to defeat reinforced concrete structures, bunkers, light armoured vehicles and personnel targets.

### DESCRIPTION

The HESH-T (HEP-T) projectile consist of a thin walled steel cylindrical body with a driving band, a relatively short ogive and a base plug to which is secured the tracer and the dual safety base detonating electronic fuze, which complies with Stanag 4187 and MIL-STD-1316.

It is loaded with Composition A3 explosive. The projectile is assembled to a brass cartridge case which is loaded with a cool burning, single base, multi-perforated propelling charge.

### TECHNICAL DATA

Type	Fixed round HESH-T
Calibre	90mm
Round mass (nominal)	8.5kg
Round length	590mm
Projectile mass (nominal)	4.5kg
Projectile filling (Comp B)	1.2kg
Fuze	BD
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.3kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	800m/s
Dispersion	0.5 Mils
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm MK3 HE-TP-T

## M637A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns for gunnery training.

### DESCRIPTION

A training practice round with an inert warhead, a tracer and tail fin assembly, mounted on a brass cartridge case. The round uses single base propellant and is fitted with a mechanical primer.

It is designed to match the ballistics of the in-service HE-T M616A1 round.

### TECHNICAL DATA

Type	Fixed round HE-TP-T
Calibre	90mm
Round mass (nominal)	9.0kg
Round length	611mm
Projectile mass (nominal)	5.1kg
Projectile	Inert
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	714m/s
Dispersion	0.5 Mils
Operational range	800m
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# TD 20-90

## M640 SERIES



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns for gunnery training.

### DESCRIPTION

The Training Device (TD) 20-90 is a sub-calibre system used for gun crew training. It consists of a Training Device comprising a 20mm rifled barrel in a mount having the shape of a 90mm round. 20mm sub-calibre M634A1 TP-T rounds are loaded in the Training Device to be fired from the 90mm gun out to the combat range

of the full bore rounds. The Training Device is loaded into the gun chamber, and the TP-T round is then loaded into the Training Device and is fired using the main gun firing mechanism. Requiring minimum routine maintenance, it provides a complete and inexpensive training system.

### TRAINING DEVICE: TD 20-90 M640

Calibre	90mm
Round mass (nominal)	9.3kg
Round length	703mm

### SUBCALIBRE

Calibre	20mm
Round length	703mm
Rifling	12 grooves
Service life	>2,000 rounds

### AMMUNITION: TD 20-90 M634A1

20mm Target Practice round with tracer, for use with the sub-calibre Training Device TD 20-90 M640. The trajectory of the projectile will provide a match to M616 HE rounds at a range of 1,000 metres.

Round mass (nominal)	190g
Round length	187mm
Projectile mass	85g
Launch velocity	783m/s
Duration of tracer	4s
Ignition	Percussion primer
Method of firing	Main gun firing mechanism

### STATUS

In service

# 90mm MK3 APFSDS-T

## M652A1



### MISSION

For use with current in-service 90mm Cockerill MKIII MA1 guns and similarly equipped ENGESA EC-90 light guns to defeat armoured targets, including multi plate spaced armour, using the kinetic energy of the tungsten alloy long rod penetrator.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a

tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	90mm
Round mass (nominal)	7.2kg
Round length	650mm
Projectile mass (nominal)	2.5kg
Penetrator	Steel
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Percussion cap M61
Propellant (nominal)	1.8kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1210m/s
Dispersion	0.3 Mills
Penetration (60° obliquity)	100mm RHA
Operational range	>1,500m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
UN Classification: 1.2 C UN 0328

### STATUS

Under development

# 90mm MK3 HESH-TP-T

## M655



### MISSION

For use with current in-service 90mm Cockerill MKIII and Engesa EC-90 guns to provide cost effective and live fire training of gun crews.

### DESCRIPTION

This round is similar in appearance and ballistically similar to the HESH-T M625A1 service round. The projectile consists of an inert body with a driving band, a relatively short ogive and a base plug to which is secured the tracer. The projectile is assembled to a brass cartridge case which is loaded with a

single base, multi-perforated propelling charge.

### TECHNICAL DATA

Type	Fixed round HESH-TP-T
Calibre	90mm
Round mass (nominal)	8.2kg
Round length	600mm
Projectile mass (nominal)	4.3kg
Projectile filling	Inert
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.2kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	800m/s
Effective range	>2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

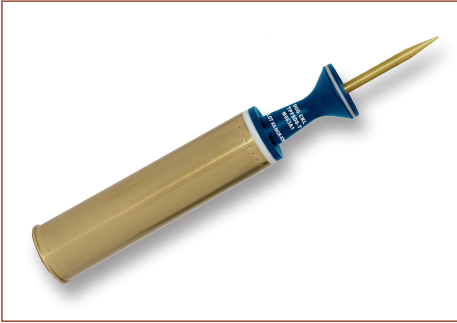
2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm MK3 TPFSDS-T

## M663A1



### MISSION

For use with current in-service 90mm Cockerill MKIII and ENGESA EC-90 light guns for gunnery training.

### DESCRIPTION

The projectile consists of a sub-projectile and a sabot. The sub-projectile comprises a steel penetrator and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot.

The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant. The form, weight and ballistics of the M663 provide a good match to the M652A1 round.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	90mm
Round mass (nominal)	7.1kg
Round length	665mm
Projectile mass (nominal)	2.4kg
Penetrator	Steel
Tracer	M21
Cartridge case	Brass
Anti-wear additive	Titanium dioxide
Primer	Percussion cap M61
Propellant (nominal)	1.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1210m/s
Dispersion	0.3 Mills
Operational range	>1,500m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm F3/F4 SMK(WP)-T

## M667



### MISSION

For use with 90mm F3 & F4 guns, used in the TS90 and FL10 turrets which are fitted to various armoured vehicles such as AMX13, AMX10 PAC, ERC 90, SAGAIE, VAB and MOWAG, for screening, signalling or target spotting purposes as well as for its incendiary effects.

### DESCRIPTION

The round consists of a steel body filled with white phosphorus and fitted with an explosive burster charge, a tracer, a tail fin assembly and an electronic PD and Graze fuze. The fuze has

two independent safeties, and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge case which is filled with double base propellant and fitted with a mechanical primer. Ballistically similar to the HE-T M678 round.

### TECHNICAL DATA

Type	Fixed round SMK(WP)-T
Calibre	90mm
Round mass (nominal)	10.7kg
Round length	857mm
Projective filling (White Phosphorus)	0.9kg
Projectile mass (nominal)	5.2kg
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant DB (nominal)	1.6kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	744m/s
Dispersion	0.5 Mils
Effective range	2,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 H UN 0243</b>

### STATUS

In service

# 90mm F4 APFSDS-T

## M669A1



### MISSION

For use with 90mm F4 guns, used in the TS90 turret which is fitted to various armoured vehicles, to defeat armoured targets, including multi plate spaced armour, using the kinetic energy of the tungsten alloy long rod penetrator.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises an Armour Piercing Fin Stabilized tungsten alloy long rod penetrator, an aluminium windshield and a tracer assembled in the fin assembly. This is

contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot. The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant.

### TECHNICAL DATA

Type	Fixed round APFSDS-T
Calibre	90mm
Round mass (nominal)	10.5kg
Round length	947mm
Projectile mass (nominal)	3.7kg
Penetrator	Tungsten Alloy
Tracer	M21
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	2.8kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1275m/s
Dispersion	0.32 Mils
Defeats 150mm target at 60° (NATO HEAVY TARGET)	1,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm F3/F4 HE-T

## M678



### MISSION

For use with 90mm F3 & F4 guns, used in the TS90 and FL10 turrets which are fitted to various armoured vehicles such as AMX13, AMX 10 PAC, ERC 90, SAGAIE, VAB and MOWAG, to provide blast and fragmentation for use against light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with Composition B explosive, a tracer, a tail fin assembly and an electronic PD and Graze fuze.

The fuze has two independent safeties, and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge case which is filled with double base propellant and fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round HE-T
Calibre	90mm
Round mass (nominal)	10.6kg
Round length	860mm
Projectile mass (nominal)	5.1kg
Projective filling (Comp B)	1.1kg
Fuze	EPD
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant DB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	766m/s
Dispersion	0.5 Mills
Operational range	910m
Effective range	2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm F3/F4 HEAT-T

**M679**

**MISSION**

For use with 90mm F3 & F4 guns, used in the TS90 and FL10 turrets which are fitted to various armoured vehicles such as AMX13, AMX 10 PAC, ERC 90, SAGAIE, VAB and MOWAG, to defeat armoured targets and structures by means of its shaped charge effect.

**DESCRIPTION**

A High Explosive Anti-Tank round, with a nose cone, a body, a tail fin assembly and a tracer. The body is filled with high explosive and is fitted with a copper liner and an electronic

Base Detonating fuze with two independent in-bore safeties. The fuze has a nose switch and a graze element and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge case which is filled with single base propellant and fitted with a mechanical primer.

**TECHNICAL DATA**

Type	Fixed round HEAT-T
Calibre	90mm
Round mass (nominal)	9.8kg
Round length	900mm
Projectile mass (nominal)	4.0kg
Projectile filling (Octol)	600g
Fuze	PIBD
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	962m/s
Dispersion	0.5 Mils
Effective range	2,000m
Penetration (RHA at 0°obliquity)	250mm
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

**STATUS**

In service

# 90mm F4 TPFSDS-T

## M698



### MISSION

For use with 90mm F4 guns, used in the TS90 turret which is fitted to various armoured vehicles, for gunnery training.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises a steel penetrator and a tracer assembled in the fin assembly. This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot.

The projectile is crimped to the cartridge case which is loaded with cool burning, multi-perforated, loose propellant. The trajectory of the projectile is ballistically similar to the standard M669 APFSDS-T round.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	90mm
Round mass (nominal)	10.3kg
Round length	944mm
Projectile mass (nominal)	3.2kg
Penetrator	Steel
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	2.9kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1300m/s
Dispersion	0.32 Mils
Operational range	2,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 H UN 0328</b>

### STATUS

In service

# 90mm F3/F4 HEAT-TP-T

## M699



### MISSION

For use with 90mm F3 & F4 guns, used in the TS90 and FL10 turrets which are fitted to various armoured vehicles such as AMX13, AMX10 PAC, ERC 90, SAGAIE, VAB and MOWAG, for gunnery training.

### DESCRIPTION

A High Explosive Anti-Tank Training Practice round, with an inert warhead, and fitted with a tail fin assembly and tracer. It is mounted on a brass cartridge case, uses single base propellant and is fitted with a mechanical primer. The

round is designed to match the ballistics of the in-service HEAT-T M679 round.

### TECHNICAL DATA

Type	Fixed round HEAT-TP-T
Calibre	90mm
Round mass (nominal)	9.8kg
Round length	902mm
Projectile mass (nominal)	4.1kg
Projectile	Inert
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	950m/s
Dispersion	0.5 Mills
Effective range	2,000m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm F1 HEAT-T

## M630



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns to defeat armoured targets and structures by means of its shaped charge effect.

### DESCRIPTION

A High Explosive Anti-Tank round, with a nose cone, a body, a tail fin assembly and a tracer. The body is filled with high explosive and is fitted with a copper liner and an electronic Base Detonating fuze with two independent in-bore safeties. The fuze has a nose switch and a graze element and complies with Stanag 4187

and Mil-Std-1316.

### TECHNICAL DATA

Type	Fixed round HEAT-T
Calibre	90mm
Round mass (nominal)	8.4kg
Round length	690mm
Projectile mass (nominal)	4.2kg
Projectile filling (Octol)	0.6kg
Fuze	PIBD
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	1.3kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	750m/s
Dispersion	0.5 Mils
Effective range	800m
Penetration (RHA at 0° Obliquity)	250mm
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm F1 HE-T

## M631



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns to defeat light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with Composition B explosive, a tracer, a tail fin assembly and a mechanical PD fuze. The fuze has one mechanical safety and an additional transport safety cap. The projectile is mounted on a brass cartridge case which is filled with

single base multi-perforated propellant and fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round HE-T
Calibre	90mm
Round mass (nominal)	9.0kg
Round length	612mm
Projectile mass (nominal)	5.1kg
Projective filling (Comp B)	1.1kg
Fuze	PDM
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	658m/s
Dispersion	0.5 Mills
Combat range	1,000m
Maximum range	1,800mm
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm F1 HE-T

## M631A1



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns to defeat light structures and material targets, personnel or for general demolition.

### DESCRIPTION

The round consists of a steel body filled with Composition B explosive, a tracer, a tail fin assembly and an electronic PD and Graze fuze. The fuze has two independent safeties, and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge

case which is filled with single base multi-perforated propellant and fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round HE-T
Calibre	90mm
Round mass (nominal)	9.0kg
Round length	612mm
Projectile mass (nominal)	5.1kg
Projective filling (Comp B)	1.1kg
Fuze	EDP
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	658m/s
Dispersion	0.5 Mills
Combat range	1,000m
Maximum range	1,800m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 90mm F1 SMK (WP)-T

## M632A1



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns. A spotting and smoke screen round, with incendiary effects.

### DESCRIPTION

The round consists of a steel body filled with White Phosphorus and fitted with an explosive burster charge, a tracer, a tail fin assembly and an electronic PD and Graze fuze. The fuze has two independent safeties, and complies with Stanag 4187 and Mil-Std-1316. The projectile is mounted on a brass cartridge case which is

filled with single base propellant and fitted with a mechanical primer. Ballistically similar to the HE-T M631 round.

### TECHNICAL DATA

Type	Fixed round SMK(WP)-T
Calibre	90mm
Round mass (nominal)	9.2kg
Round length	612mm
Projectile mass (nominal)	5.2kg
Projective filling (White Phosphorus)	1kg
Fuze	EDP, Graze
Tracer	M22
Cartridge case	Brass
Primer	Percussion cap M61
Propellant SB (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	658m/s
Dispersion	0.5 Mils
Combat range	1,000m
Maximum range	1,800m
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 H UN 0245</b>

### STATUS

In service

# 90mm F1 HEAT-TP-T

## M653



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns, for gunnery training.

### DESCRIPTION

A High Explosive Anti-Tank Training Practice round, with an inert warhead, and fitted with a tail fin assembly and tracer. It is mounted on a brass cartridge case, uses single base propellant and is fitted with a mechanical primer. The round is designed to match the ballistics of the in-service HEAT-T M630 round.

### TECHNICAL DATA

Type	Fixed round HEAT-TP-T
Calibre	90mm
Round mass (nominal)	7.8kg
Round length	670mm
Projectile mass (nominal)	4.2kg
Projectile	Inert
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	1.1kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	750m/s
Dispersion	0.5 Mils
Effective range	800m
Operational temperature	-32°C to +62°C

### PACKAGING

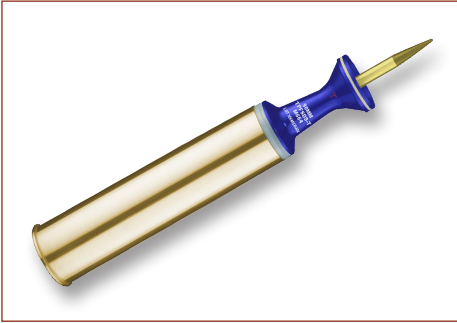
2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 90mm F1 TPFSDS-T

## M664



### MISSION

For use with current in-service 90mm CN 90 F1 (DEFA) guns, for gunnery training.

### DESCRIPTION

The projectile consists of a sub-projectile and sabot. The sub-projectile comprises a steel penetrator and a tracer assembled in the fin assembly.

This is contained within a 3-piece aluminium Discarding Sabot, held in place with a plastic band at the forward end and a plastic obturating band at the rear end of the sabot.

### TECHNICAL DATA

Type	Fixed round TPFSDS-T
Calibre	90mm
Round mass (nominal)	6.8kg
Round length	665mm
Projectile mass (nominal)	2.5kg
Penetrator	Steel
Tracer	M13
Cartridge case	Brass
Primer	Percussion cap M61
Propellant (nominal)	1.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	1,050m/s
Dispersion	0.32 Mils
Operational temperature	-32°C to +52°C

### PACKAGING

2 rounds per twin container
18 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 76mm HESH-T

## M329



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) against personnel, bunkers, light armour and structures and other material targets.

### DESCRIPTION

The hollow steel thin wall forged projectile has a flat base and a cylindrical body with an ogive nose. The projectile is loaded with 1kg of Composition A3 high explosive. The fuze is mounted in the rear of the projectile. A tracer is mounted on the projectile base. The projectile

is fixed on a brass cartridge case, which contains a single base multi-perforated propellant and is fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round, HESH-T
Calibre	76mm
Round mass (nominal)	7.7kg
Round length	540mm
Projectile mass (nominal)	5.6kg
Projectile filling (Comp A3)	1.2kg
Fuze	BD/graze
Tracer	M23
Cartridge case	Brass
Primer	Percussion cap
Propellant SB (nominal)	0.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	533m/s
Dispersion	0.5 Mils
Range, Direct Fire	2,400m
Range, Indirect Fire	6,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 76mm HE-T

## M330



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) against personnel and material targets and in order to provide fire support to infantry.

### DESCRIPTION

The high fragmentation steel projectile is loaded with Composition B and is equipped with a Point Detonating fuze model M739 or equivalent. A tracer is mounted on the projectile base. The projectile is fixed on a brass cartridge case, which contains a single base multi-perforated

propellant and a mechanical primer.

### TECHNICAL DATA

Type	Fixed round, HE-T
Calibre	76mm
Round mass (nominal)	7.7kg
Round length	535mm
Projectile mass (nominal)	5.6kg
Projectile filling (Comp B)	0.7kg
Fuze	PD
Tracer	M23
Cartridge case	Brass
Primer	Percussion cap
Propellant SB (nominal)	0.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	514m/s
Dispersion	0.5 Mills
Range, Direct Fire	2,400m
Range, Indirect Fire	6,000m
Number of fragments	+/- 800
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 76mm HESH-TP-T

## M331



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) to provide cost effective marksmanship and live fire training of gun crews.

### DESCRIPTION

The round is similar in appearance and ballistically to the HESH-T M329 Service round. The projectile consists of a steel cylindrical body with a relatively short ogive, and a flat base with a tracer. The projectile is assembled to a brass cartridge case, which is loaded with a

single base multi-perforated propelling charge and a mechanical primer.

### TECHNICAL DATA

Type	Fixed round, HESH-TP-T
Calibre	76mm
Round mass (nominal)	7.7kg
Round length	540mm
Projectile mass (nominal)	5.6kg
Projectile	Inert
Tracer	M23
Cartridge case	Brass
Primer	Percussion cap
Propellant SB (nominal)	0.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	533m/s
Dispersion	0.5 Mills
Range, Direct Fire	2,400m
Range, Indirect Fire	6,000m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 76mm Canister

## M333



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) against personnel at close quarters.

### DESCRIPTION

The thin walled cylindrical body is loaded with steel pellets and is fitted with a base plug. When fired, the projectile breaks open, upon leaving the muzzle, and projects the steel pellets in a cone with an effective range of approximately 100 metres. The projectile is fixed on a brass cartridge case, which contains a single base

multi-perforated propellant and is fitted with a mechanical primer.

### TECHNICAL DATA

Type	Fixed round, Canister
Calibre	76mm
Round mass (nominal)	7.7kg
Round length	530mm
Projectile mass (nominal)	5.6kg
Fragments (Ø 13/32' steel spheres)	+/- 800 spheres
Fragments weight	4kg
Cartridge case	Brass
Primer	Percussion cap
Propellant SB (nominal)	0.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	533m/s
Effective Range	100m
Maximum Range	700m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 76mm Blank

## M335



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) to provide battlefield sound effects for training. It may also be used for saluting purposes.

### DESCRIPTION

The 76mm Blank cartridge uses a standard brass cartridge case and primer. It is filled with a charge which provides an audible sound when ignited by the primer. The charge is held in place using a closure plug.

### TECHNICAL DATA

Type	Fixed round, Blank
Calibre	76mm
Round mass (nominal)	1.5kg
Round length	170mm
Cartridge case	Brass
Primer	Percussion cap
Propellant (nominal)	150g

### PERFORMANCE

Operational temperature	-32°C to +62°C
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### PACKAGING

5 rounds per twin container
35 containers per pallet

### STATUS

In service

# 76mm SMK (WP)-T

## M337



### MISSION

For use in the 76mm L5A1 (on Saladin) or L23/23A1 guns (on Scorpion light tanks) to provide smoke screening, spotting and signalling.

### DESCRIPTION

The steel bodied projectile is loaded with White Phosphorus, a central burster charge and is equipped with a Point Detonating fuze. A tracer is mounted on the projectile base. The projectile is fixed on a brass cartridge case, which contains a single base multi-perforated

propellant. The round is ballistically similar to the HE-T M330 cartridge.

### TECHNICAL DATA

Type	Fixed round, SMK (WP)-T
Calibre	76mm
Round mass (nominal)	7.7kg
Round length	535mm
Projectile mass (nominal)	5.6kg
Projective filling (White phosphorus)	0.5kg
Fuze	PD
Tracer	M23
Cartridge case	Brass
Primer	Percussion cap
Propellant SB (nominal)	0.7kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	514m/s
Dispersion	0.5 Mills
Range, Direct Fire	2,400m
Range, Indirect Fire	6,000m
Operational temperature	-32°C to +62°C

### PACKAGING

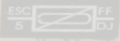
2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 H UN 0245</b>

### STATUS

Qualified



6814 0016





# Medium Calibre Ammunition



# 40mm GPR-PD-T

## 40mm CASED TELESCOPED ARMAMENT SYSTEM (CTAS)



### MISSION

The 40mm ammunition is intended for use in the 40mm CTAS weapon.

The General Purpose Round - Point Detonating - Tracer (GPR-PD-T) is a highly efficient multi-role ammunition with high levels of suppression defeating reinforced concrete 100mm thick up to 500m.

The fuze, fully compliant with STANAG 4187, ensures performances against light vehicles, urban and soft targets even at very short range, and allow self-destruction of the ammunition between 3,000m and 6,000m.

### DESCRIPTION

The 40mm GPR-PD-T cartridge is composed of :

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- A shell loaded with IM explosive
- A day/night tracer
- A mechanical fuze with SD mode fuze (MR4015) equipped with two safety systems compliant with the STANAG 4187 requirements.

### TECHNICAL DATA

Type	General Purpose Round - Point Detonating -Tracer (GPR-PD-T)
Calibre	40mm
Cartridge weight	~2,400g
Cartridge length	255mm
Cartridge diameter	65mm
Projectile weight	980g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Fuze	MR4015 Muzzle safety ≥ 15m
Explosive IM XP	~115g (insensitive high explosive) IM Stanag 4439 compliant
Propellant	~350g

### PERFORMANCE

Initial velocity	990m/s
Operational use	Up to 2,500m
Dispersion	< 0.5 mils RMS at 1,500m
Perforation	Single reinforced concrete wall 100mm thick at 500m
Tracer duration (+21°C)	≥ 3.4s

### PACKAGING

Box	Metallic box M548
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### STATUS

Under qualification

# 40mm APFSDS-T

## 40mm CASED TELESCOPED ARMAMENT SYSTEM (CTAS)



### MISSION

The 40mm ammunition is intended for use in the 40mm CTAS weapon.

The Armor Piercing Fin Stabilised Discarding Sabot-Tracer (APFSDS-T) is an highly efficient ammunition to defeat medium armoured vehicles and early generation of Main battles Tanks.

The 40mm APFSDS-T is equipped with a projectile optimised and able to penetrate 140mm of steel RHA at 1,500m.

### DESCRIPTION

The 40mm APFSDS-T cartridge is composed of :

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert penetrator in tungsten alloy
- A discarding sabot
- A day/night tracer

### TECHNICAL DATA

Type	Armor Piercing Fin Stabilised Discarding Sabot-Tracer (GPR-PD-T)
Calibre	40mm
Cartridge weight	~1,900g
Cartridge length	255mm
Cartridge diameter	65mm
Projectile weight	550g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~525g

### PERFORMANCE

Initial velocity	1,510m/s
Operational use	Up to 3,500m
Dispersion	< 0.4 mils RMS at 1,500m
Penetration RHA	140mm at 1,500m
Tracer duration (+21°C)	≥ 1.1s

### PACKAGING

Box	Metallic box M548
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### STATUS

Qualified

# 40mm GPR-AB-T

## 40mm CASED TELESCOPED ARMAMENT SYSTEM (CTAS)



### MISSION

The 40mm ammunition is intended for use in the 40mm CTAS weapon.

The General Purpose Round - Airburst - Tracer (GPR-AB-T) is a highly efficient multi-role ammunition with high levels of suppression, defeating reinforced concrete 100mm thick up to 500m.

The 40mm GPR-AB-T can be used in airburst mode above ground targets or in point detonating mode. The SD base fuze, fully compliant with STANAG 4187, ensures performance against light vehicles, urban and soft targets even at very short range, and allow self-destruction of the ammunition between 3,000m and 6,000m.

### DESCRIPTION

The 40mm GPR-AB-T cartridge is composed of :

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- A shell loaded with IM explosive
- A day/night tracer
- An electromechanical fuze (point detonating, Airburst and self destruction) compliant with STANAG 4187 requirements. Fully programmable on load into breach.

### TECHNICAL DATA

<b>Type</b>	General Purpose Round - Airburst -Tracer (GPR-AB-T)
<b>Calibre</b>	40mm
<b>Cartridge weight</b>	~2,400g
<b>Cartridge length</b>	255mm
<b>Cartridge diameter</b>	65mm
<b>Projectile weight</b>	980g
<b>Cartridge case</b>	Steel (lacquering protection)
<b>Primer</b>	Mechanical
<b>Fuze</b>	40 GPR AB (dual mode point detonating and airburst) Muzzle safety $\geq$ 15m
<b>Explosive IM XP</b>	~115g (insensitive high explosive) IM Stanag 4439 compliant
<b>Propellant</b>	~350g

### PERFORMANCE

<b>Initial velocity</b>	990m/s
<b>Operational use</b>	Up to 2,500m
<b>Dispersion</b>	< 0.5 mils RMS at 1,500m
<b>Perforation</b>	Single reinforced concrete wall 100mm thick at 500m
<b>Tracer duration (+21°C)</b>	$\geq$ 3.4s

### PACKAGING

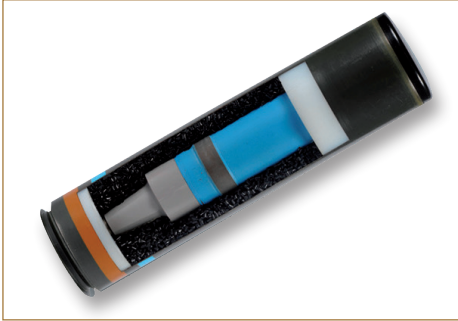
<b>Box</b>	Metallic box M548
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### STATUS

Under development

# 40mm TP-T

## 40mm CASED TELESCOPED ARMAMENT SYSTEM (CTAS)



### MISSION

The 40mm ammunition is intended for use in the 40mm CTAS weapon.

The 40mm Target Practice - Tracer is a training ammunition based on an inert projectile of the form used in the GPR-PD-T and GPR-AB-T projectile and reproducing the ballistic trajectory of the combat ammunition.

### DESCRIPTION

The 40mm TP-T cartridge is composed of :

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert penetrator in tungsten alloy
- A day/night tracer

### TECHNICAL DATA

Type	Target Practice - Tracer (TP-T)
Calibre	40mm
Cartridge weight	~2,400g
Cartridge length	255mm
Cartridge diameter	65mm
Projectile weight	980g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~350g

### PERFORMANCE

Initial velocity	> 1,000m/s
Operational use	Up to 2,500m
Dispersion	0.5 mils RMS at 1,500m
Tracer duration (+21°C)	≥ 3.5s

### PACKAGING

Box	Metallic box M548
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### STATUS

Qualified

# 40mm TPRR-T

## 40mm CASED TELESCOPED ARMAMENT SYSTEM (CTAS)



### MISSION

The 40mm ammunition is intended for use in the 40mm CTAS weapons. The Target Practice Reduced Range - Tracer (TPRR-T) is a training ammunition using a plastic case tube, lightweight projectile and reduced quantity of propellant to give a low cost training solution with low barrel pressure and reduced barrel wear.

### DESCRIPTION

The TPRR-T ammunition is designed to be in accordance with GPR-PD-T and GPR-AB-T trajectories up to 1,500m and to limit the maximum range under 6,500m (GPR-PD-T and GPR-AB-T maximum range ~ 8,500m)

### TECHNICAL DATA

Type	Target Practice Reduced Range - Tracer (TPRR-T)
Calibre	40mm
Cartridge weight	~1,900g
Cartridge length	255mm
Cartridge diameter	65mm
Projectile weight	730g
Cartridge case	Plastic
Primer	Mechanical
Propellant	~250g

### PERFORMANCE

Initial velocity	> 1,000m/s
Operational use	Up to 1,500m
Tracer duration (+21°C)	≥ 3.5s

### PACKAGING

Box	Metallic box M548
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### STATUS

Under development

# 30mm x 173 APFSDS-T

**M928**

**MISSION**

This ammunition is intended for use against armoured targets and can defeat multi plate spaced armour using the kinetic energy of its long rod tungsten alloy penetrator. It has been specially designed for use in the 30 x 173mm cannon, as fitted on LAV's vehicles.

**DESCRIPTION**

This cartridge is an Armour Piercing Fin Stabilized Discarding Sabot with Tracer (APFSDS-T) type. It consists of a subcalibre fin stabilized tungsten alloy projectile launched by

means of a lightweight sabot. Penetration at any given range, and conversely range for any given penetration, is greatly enhanced compared to older generation of APDS or AP projectiles.

**TECHNICAL DATA**

Type	Fixed round, APFSDS-T
Calibre	30mm
Round mass (nominal)	530g* - 695g**
Round length	290mm
Projectile mass (nominal)	220g
Penetrator	Tungsten Alloy Cobalt Free
Tracer	2.5s
Cartridge case	Aluminium*/Steel**
Primer	Percussion cap
Propellant ECL (nominal)	165g

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	1,430m/s
Penetration at 1,000m	> 60mm RHA steel at 60° obliquity
Dispersion	< 0.44 Mils
Operational temperature	-32°C to +62°C

\*Bushmaster II MK 44 gun & GI-30 gun

\*\* MK 30-2 gun

**PACKAGING**

As per customer requirements

**STATUS**

Qualified

# 30mm x 165 APFSDS-T

**M929**

**MISSION**

For use in the BMP 2 vehicles equipped with the 30mm 2A42 cannons. This cartridge is designed to defeat light and medium armoured vehicles.

**DESCRIPTION**

This cartridge is an Armour Piercing Fin Stabilized Discarding Sabot with Tracer (APFSDS-T) type. It consists of a subcalibre fin stabilized tungsten alloy projectile launched by means of a lightweight sabot. Penetration, at any given range, and conversely range for any

given penetration, is greatly enhanced compared to older generation of APDS or AP projectiles.

**TECHNICAL DATA**

Type	Fixed round, APFSDS-T
Calibre	30mm
Round mass (nominal)	690g
Round length	293mm
Projectile mass (nominal)	235g
Penetrator	Tungsten Alloy Cobalt Free
Tracer	2.5s
Cartridge case	Steel
Primer	Percussion cap
Propellant ECL (nominal)	130g

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	1,260m/s
Penetration at 1,000m	> 50mm RHA steel at 60° obliquity
Dispersion	< 0.44 Mils
Operational temperature	-32°C to +62°C

**PACKAGING**

As per customer requirements

**STATUS**

Qualified

# 30mm x 150 SAPHEI

## AMMUNITION FOR 30M791 CANNON



### MISSION

The 30mm x 150 ammunition is intended for use in the 30M791 automatic weapon fitted to Rafale aircraft.

This ammunition have been developed for either Air-to-Air or Air-to-Ground missions As OEM the Nexter 30mm x 150 family is the only ammunition qualified on 30M791 weapon by the French DGA and DASSAULT.

### DESCRIPTION

The 30 x 150 SAPHEI cartridge is composed of:

- A steel cartridge case
- An electric primer 1A/1W
- A propellant load adapted to extremely severe thermal conditions
- An explosive shell loaded with RDX/aluminium
- A SD base fuze (MR3015) equipped with two safety systems compliant with the STANAG 4187 requirements.

### TECHNICAL DATA

<b>Type</b>	Semi Armour Piercing High Explosive Incendiary (SAPHEI)
<b>Calibre</b>	30mm
<b>Round mass</b>	~550g
<b>Round length</b>	≤ 250mm
<b>Cartridge diameter</b>	65mm
<b>Projectile mass</b>	275g
<b>Cartridge case</b>	Steel (lacquering protection)
<b>Primer</b>	Electric - M650 1A/1W
<b>Propellant</b>	~90g
<b>Fuze</b>	MR3015 Safety distance: ≥15m Self-destruction: 5 to 17s
<b>Link</b>	M791

### PERFORMANCE

<b>Initial velocity</b>	1,025 m/s
<b>Operational use</b>	Up to 2,500m
<b>Dispersion</b>	≤ 0.6 mils
<b>Perforation RHA(thickness/angle/distance)</b>	15mm/30°/800m

### PACKAGING

Metallic box CMC300

The inside of the box is covered with wood, which reinforces its fire protection. It can resist to a 870°C fire for 3mn without any pyrotechnical reaction. It ensures the non-transmission through influence in case of an unexpected detonation of a shell

### STATUS

In service

# 30mm x 150 TP

## AMMUNITION FOR 30M791 CANNON



### MISSION

The 30mm x 150 ammunition is intended for use in the 30M791 automatic weapon fitted to Rafale aircraft.

This ammunition have been developed for either Air-to-Air or Air-to-Ground missions. As OEM the Nexter 30mm x 150 family is the only ammunition qualified on 30M791 weapon by the French DGA and DASSAULT.

### DESCRIPTION

The 30 x 150 TP cartridge is composed of:

- A steel cartridge case
- An electric primer 1A/1W
- A propellant load adapted to extremely severe thermal conditions
- An inert shell fitted with a sintered-iron driving band

### TECHNICAL DATA

Type	Target Practice (TP)
Calibre	30mm
Cartridge weight	~550g
Cartridge Length	250mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - M650 1A/1W
Propellant	~90g
Link	M791

### PERFORMANCE

Initial velocity	1,025 m/s
Operational use	Up to 2,500m
Dispersion	≤ 0,6 mils

### PACKAGING

Metallic box CMC300

The inside of the box is covered with wood, which reinforces its fire protection.

### STATUS

In service

# 30mm x 113B SAPHEI

## AMMUNITION FOR DEFA 30mm CANNON



### MISSION

The 30mm x 113B ammunition is intended for use in the DEFA 30mm automatic weapons fitted to Mirage, Alphajet, Macchi ... This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions. As OEM the Nexter 30mm x 113B family is the only ammunition qualified on DEFA weapon family by the French DGA and DASSAULT.

### DESCRIPTION

The 30 x 113 SAPHEI cartridge is composed of:

- A steel cartridge case
- An electric primer
- A propellant load adapted to extremely severe thermal conditions
- An explosive shell loaded with RDX/aluminium
- A SD base fuze (MR3005) equipped with two safety systems

### TECHNICAL DATA

Type	Semi Armour Piercing High Explosive Incendiary (SAPHEI) F7670 type
Calibre	30mm
Cartridge weight	~490g
Cartridge Length	≤ 200mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - type 52N92
Propellant	~50g
Explosive	~16g
Fuze	MR3005 Safety distance: ≥20m Self-destruction: 6 to 15s
Link	F51

### PERFORMANCE

Initial velocity	775m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m
Perforation RHA (thickness/angle/distance)	15mm/45°/200m

### PACKAGING

Box	Wooden box 02D101 or Metallic box CMC300 or CMC30
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### STATUS

In service

# 30mm x 113B TP

## AMMUNITION FOR DEFA 30mm CANNON



### MISSION

The 30mm x113B ammunition is intended for use in the DEFA 30mm automatic weapons fitted to Mirage, Alphajet, Macchi ...

This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions.

As OEM the Nexter 30mm x113B family is the only ammunition qualified on DEFA weapon family by the French DGA and DASSAULT.

### DESCRIPTION

The 30 x 113B TP cartridge is composed of:

- A steel cartridge case
- An electric primer
- A propellant load adapted to extremely severe thermal conditions
- An inert shell fitted with a sintered iron band

### TECHNICAL DATA

Type	Target Practice (TP) F2270 type
Calibre	30mm
Cartridge weight	~490g
Cartridge Length	≤ 200mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - type 52N92
Propellant	~50g
Link	F51

### PERFORMANCE

Initial velocity	775m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m

### PACKAGING

Box	Wooden box 02D101 or Metallic box CMC300 or CMC30
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### STATUS

In service

# 30mm x 113B TP-T

## AMMUNITION FOR DEFA 30mm CANNON



### MISSION

The 30mm x113B ammunition is intended for use in the DEFA 30mm automatic weapons fitted to Mirage, Alphajet, Macchi ... This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions. As OEM the Nexter 30mm x113B family is the only ammunition qualified on DEFA weapon family by the French DGA and DASSAULT.

### DESCRIPTION

The 30 x 113 TP-T cartridge is composed of:

- A steel cartridge case
- An electric primer
- A propellant load adapted to extremely severe thermal conditions
- An inert shell fitted with a sintered iron band
- A day/night tracer

### TECHNICAL DATA

Type	Target Practice with Tracer (TP-T) F3170 type
Calibre	30mm
Cartridge weight	~455g
Cartridge Length	≤ 200mm
Projectile weight	245g
Cartridge case	Steel (lacquering protection)
Primer	Electric - type 52R92
Propellant	~50g
Link	F51

### PERFORMANCE

Initial velocity	795m/s
Operationnal use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m
Tracing duration	≥ 3s

### PACKAGING

Box	Wooden box 02D101 or Metallic CMC300 or CMC30
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### STATUS

In service

# 30mm x 113B 1A/1W SAPHEI

## 30mm AMMUNITION



### MISSION

The 30mm x 113B ammunition is intended for use in either the DEFA 30mm automatic weapons fitted to Super-Étendard or 30M781 weapon fitted to Tigre helicopter.

This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions.

As OEM the Nexter 30mm x 113B family is the only ammunition qualified on DEFA weapon family by the French DGA, DASSAULT and AIRBUS HELICOPTERS.

### DESCRIPTION

The 30 x 113 1A/1W SAPHEI cartridge is composed of:

- A steel cartridge case
- An electric primer 1A/1W
- A propellant load adapted to extremely severe thermal conditions
- An explosif shell loaded with RDX/aluminum
- A SD base fuze (MR3005) equipped with two safety systems

### TECHNICAL DATA

Type	Semi Armour Piercing High Explosive Incendiary (SAPHEI) F7671 type
Calibre	30mm
Cartridge weight	~490g
Cartridge Length	≤ 200mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - M650 1A/1W
Propellant	~50g
Explosive	16g
Fuze	MR3005 Safety distance: ≥20m Self-destruction: 6 to 15s
Link	F51

### PERFORMANCE

Initial velocity	775m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m
Perforation RHA (thickness/angle/distance)	15mm/45°/200m

### PACKAGING

Box	Metallic box CMC300 or CMC30
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### STATUS

In service

# 30mm x 113B 1A/1W SAPHEI-SSF

## 30mm DEFA F2B AND 30M781 WEAPONS



### MISSION

The 30mm x 113B ammunition is intended for use in either the DEFA 30mm automatic weapons fitted to Super-Etendard or 30M781 weapon fitted to Tigre helicopter.

This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions.

As OEM the Nexter 30mm x 113B family is the only ammunition qualified on DEFA weapon family by the French DGA, DASSAULT and AIRBUS HELICOPTERS.

### DESCRIPTION

The 30 x 113 1A/1W SAPHEI SSF (Super SaFe) cartridge is composed of:

- A steel cartridge case
- An electric primer 1A/1W
- A propellant load adapted to extremely severe thermal conditions and with LOVA characteristics
- An shell loaded with IM explosive
- A SD base fuze (MR3005S) equipped with two safety systems compliant with the STANAG 4187 requirements

### TECHNICAL DATA

Type	Semi Armour Piercing High Explosive Incendiary - Super Safe (SAPHEI-SSF)
Calibre	30mm
Cartridge weight	~490g
Cartridge Length	≤ 200mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - M650 1A/1W
LOVA Propellant	~50g
Explosive IM	16g
Fuze	MR3005S Safety distance: ≥20m Self-destruction: 6 to 15s
Link	F51

### PERFORMANCE

Initial velocity	775m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m
Perforation RHA (thickness/angle/distance)	15mm/45°/200m

### PACKAGING

Box	Metallic box CMC300 or CMC30
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### STATUS

Under development

# 30mm x 113B 1A/1W TP

30mm DEFA F2B and 30M781 weapons



## MISSION

The 30mm x 113 B ammunition is intended for use in either the DEFA 30mm automatic weapons fitted to Super-Étendard or 30M781 weapon fitted to Tigre helicopter.

This ammunition range has been developed for either Air-to-Air or Air-to-Ground missions.

As OEM the Nexter 30mm x 113B family is the only ammunition qualified on DEFA weapon family by the French DGA, DASSAULT and AIRBUS HELICOPTERS

## DESCRIPTION

The 30 x 113 1A/1W TP cartridge is composed of:

- A steel cartridge case
- An electric primer 1A/1W
- A propellant load adapted to extremely severe thermal conditions
- An inert shell fitted with a sintered iron band

## TECHNICAL DATA

Type	Target practice (TP) F2271 type
Calibre	30mm
Cartridge weight	~490g
Cartridge Length	≤ 200mm
Projectile weight	275g
Cartridge case	Steel (lacquering protection)
Primer	Electric - M650 1A/1W
Propellant	~50g
Link	F51

## PERFORMANCE

Initial velocity	775m/s
Maximum range	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m

## PACKAGING

Box	Metallic box CMC300 or CMC30
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## STATUS

In service

# 30mm x 113B-Aden HEI

## ADEN 30MM WEAPONS



### MISSION

The 30mm x 113B ADEN ammunition is intended for use in the 30mm automatic weapons as 30mm ADEN MK4 - MK5, 30mm M230, 30mm ASP-30 and similar.

This ammunition has been developed to be fired during either Air-to-Air or Air-to-Ground missions.

This ammunition is qualified by British Aerospace to be used in their aircraft all over the world.

### DESCRIPTION

The 30 x 113B ADEN HEI cartridge is composed of:

- A steel cartridge case protected with zinc coating
- An electric primer
- A propellant load adapted to extremely severe thermal conditions
- An explosive shell loaded with RDX/Aluminum
- A PD fuze (MR3001) equipped with two safety systems

### TECHNICAL DATA

Type	High Explosive Incendiary (HEI) - 5478 type
Calibre	30mm
Cartridge weight	~455g
Cartridge Length	≤ 200mm
Projectile weight	245g
Cartridge case	Steel (zinc protection)
Primer	Electric - M78
Propellant	~50g
Fuze	MR3001 Safety distance: ≥15m
Explosive	22g
Link	Mk1 ou MR1

### PERFORMANCE

Muzzle velocity	765m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m

### PACKAGING

Box	Wooden box 02D101 or Metallic box CMC300
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### STATUS

In service

# 30mm x 113B-Aden TP

## ADEN 30MM WEAPONS



### MISSION

The 30mm x 113B ADEN ammunition is intended for use in the 30mm automatic weapons as 30mm ADEN MK4 - MK5, 30mm M230, 30mm ASP-30 and similar.

This ammunition has been developed to be fired during either Air-to-Air or Air-to-Ground missions.

This ammunition is qualified by British Aerospace to be used in their aircraft all over the world.

### DESCRIPTION

The 30 x 113B ADEN TP cartridge is composed of:

- A steel cartridge case protected with zinc coating
- An electric primer
- A propellant load adapted to extremely severe thermal conditions
- An inert shell fitted with a sintered iron band

### TECHNICAL DATA

Type	Target Practice (TP) 2468 type
Calibre	30mm
Cartridge weight	~455g
Cartridge Length	≤ 200mm
Projectile weight	245g
Cartridge case	Steel (zinc coating)
Primer	Electric - M78
Propellant	~50g
Link	Mk1 ou MR1

### PERFORMANCE

Initial velocity	765m/s
Operational use	Up to 2,000m
Accuracy	H + L ≤ 50cm at 100m

### PACKAGING

Box	Wooden box 02D101 or Metallic box CMC300
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### STATUS

In service

# 25mm x 137 HEI-T

## 25mm AUTOMATIC WEAPONS



### MISSION

The 25mm x 137 ammunition is designed to be fired from 25mm automatic weapons operated by gas (KBA), by external energy (M811, M242 "Chain Gun"), or Gatling type (GAU 12) fitted to air-craft, light armoured vehicles and naval vessels mounts. This cartridge meets the STANAG 4173 requirements (25mm x137 ammunition).

### DESCRIPTION

The 25mm x 137 HEI-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An explosive shell loaded with RDX/Aluminium
- A point detonating fuze equipped with two safety systems and a self-destruction device
- A day/night tracer

### TECHNICAL DATA

Type	High-Explosive Incendiary with Tracer(HEI-T)
Calibre	25mm
Cartridge weight	~500g
Cartridge Length	220mm
Projectile weight	183g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~90g
Explosive	~27g
Fuze	MR251 Safety distance: ≥15m Self-destruction: ≥4,5 s
Link	M28

### PERFORMANCE

Initial velocity	1,100m/s
Operational use	Up to 2,500m
Dispersion	σH and σV≤0,8 mils

### PACKAGING

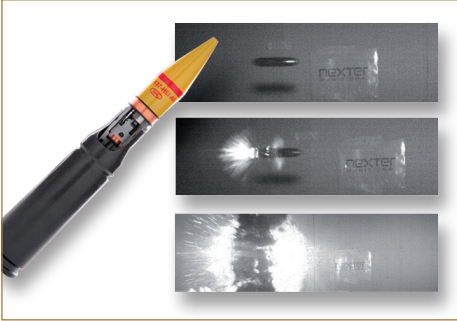
Box	Metallic box CMC30 H200
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### STATUS

In service

# 25mm x 137 HEI-AB

## 25mm AUTOMATIC WEAPONS



### MISSION

The 25mm x 137 ammunition is intended for use in the 25mm automatic weapons operated by gas (KBA), by external energy (M811, M242 "Chain Gun"), or Gatling type (GAU 12) fitted to air-craft, light armoured vehicles and naval vessels mounts. This cartridge meets the STANAG 4173 requirements (25mm x 137 ammunition).

The 25mm x 137 HEI-AB can be used in airburst mode above ground targets or in point detonating mode.

The SD base fuze, fully compliant with STANAG 4187, ensures performances against targets

even at short range and allow self-destruction of the ammunition

### DESCRIPTION

The 25mm x 137 HEI-AB cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An shell loaded with IM explosive
- A SD base chronometric fuze (point detonating, time delay and self destruction) compliant with STANAG 4187 requirements. Fully programmable on load into breach

### TECHNICAL DATA

Type	High-Explosive Incendiary with Airburst (HEI-AB)
Calibre	25mm
Cartridge weight	~500g
Cartridge Length	≤ 220mm
Projectile weight	183g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~90g
Explosive	~27g
Fuze	25 AB (dual mode point detonating and airburst) Safety distance: ≥15m Self-destruction: ≥4,5s
Link	M28

### PERFORMANCE

Initial velocity	1,100m/s
Operational use	Up to 2,500m
Dispersion	σH and σV ≤ 0,8 mils

### PACKAGING

Box	Metallic box CMC30 H200
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### STATUS

Under development

# 25mm x 137 APFSDS-T

## M935A2



### MISSION

This cartridge is designed to be fired from the 25mm KBA, the M242 Bushmaster and the M811 gun systems, in order to defeat light and medium armored vehicles.

### DESCRIPTION

This cartridge is an Armor Piercing Fin Stabilized Discarding Sabot with Tracer (APFSDS-T) type. It consists of a subcalibre fin stabilized tungsten alloy projectile launched by means of a lightweight sabot. The windshield is designed to provide excellent penetration characteristics

against high obliquity targets. The use of a specially designed single base propellant ensures good wear life characteristics.

### TECHNICAL DATA

<b>Calibre</b>	25 x 137mm
<b>Round mass (nominal)</b>	450g
<b>Round length</b>	223mm
<b>Projectile mass (nominal)</b>	130g
<b>Penetrator</b>	Tungsten Alloy Cobalt Free
<b>Tracer</b>	Min 2.4s
<b>Cartridge Case</b>	Steel
<b>Propellant (nominal)</b>	100g

### PERFORMANCE

<b>Muzzle velocity (at 21°) (nominal)</b>	1,440m/s
<b>Penetration at 1,000m (V50)</b>	> 40mm RHA at 60° obliquity
<b>Penetration at 2,000m (V50)</b>	> 30mm RHA at 60° obliquity
<b>Dispersion</b>	max. 0.6 Mils
<b>Operational temperature</b>	-32°C to +62°C

### PACKAGING

15 rounds on a belt, and 2 belts per weatherproof metal container
28 containers per pallet
<b>UN Classification : 1.2 C UN 0328</b>

### STATUS

In service

# 25mm x 137 TP-T

## 25mm AUTOMATIC WEAPONS



### MISSION

This practice round is designed to be fired from 25mm automatic weapons operated by gas (KBA), by external energy (M811, M242 "Chain Gun"), or of the Gatling type (GAU12) fitted to aircraft mounts, light armoured vehicles, naval vessels and aircrafts.

This round meets the STANAG 4173 requirements (25mm x 137 ammunition).

### DESCRIPTION

The 25mm x 137 TP-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert shell
- A day/night tracer

### TECHNICAL DATA

Target Practice with Tracer shell (TP-T).

<b>Type</b>	TP-T
<b>Calibre</b>	25mm
<b>Cartridge weight</b>	500g
<b>Cartridge length</b>	220mm
<b>Projectile weight</b>	183g
<b>Cartridge case</b>	Steel (lacquering protection)
<b>Primer</b>	Mechanical
<b>Propellant</b>	~90g
<b>Link</b>	M28

### PERFORMANCES

<b>Initial velocity</b>	1,100m/s
<b>Operational use</b>	Up to 2,500m
<b>Dispersion</b>	$\sigma_H$ and $\sigma_V \leq 0.8$ mils

### PACKAGING

<b>Box</b>	Metallic box CMC30 H200
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### STATUS

In service

# 25mm TP-T

## M936



### MISSION

This cartridge is designed to be fired from the 25mm KBA and the M242 Bushmaster gun system, for gunnery training.

### DESCRIPTION

This cartridge is a Training Practice with Tracer (TP-T) type. It consists of an inert projectile with a tracer mounted in the rear. The projectile is mounted on a steel cartridge case which is filled with single base propellant. The M936 round is ballistically matched to the Mecar M938 HEI-T,

and the US M793 TP-T and M792 HEI-T rounds. The M936 cartridge replaces the existing US M793 TP-T cartridge.

### TECHNICAL DATA

Type	Fixed round, TP-T
Calibre	25 x 137mm
Cartridge weight	500g
Cartridge length	217mm
Projectile weight	190g
Cartridge case	Steel
Primer	Percussion cap
Propellant (nominal)	90g

### PERFORMANCE

Initial velocity	1,100m/s
Dispersion	max. 0.5 Mils
Operational temperature	-32°C to +62°C

### PACKAGING

15 rounds on a belt, and 2 belts per weatherproof metal container. 28 containers per pallet.

Gross weight (metal container)	23.5kg
Dimension ext (metal container).	365 x 145 x 355mm
Gross weight (complete pallet)	670kg
Dimension ext (complete pallet)	1200 x 800 x 870mm
UN Classification : 1.2 C UN 0328	

### STATUS

In service

# 25mm x 137 TPRR-T

## 25mm AMMUNITION



### MISSION

The 25mm x 137 ammunition is designed to be fired from 25mm automatic weapons operated by gas (KBA), by external energy (M811, M242 "Chain Gun"), or Gatling type (GAU 12) fitted to air-craft, light armoured vehicles and naval vessels mounts. This cartridge meets the STANAG 4173 requirements (25mm x 137 ammunition).

### DESCRIPTION

The TPRR-T ammunition is designed to be in accordance with HEI-T trajectory up to 1,000m and to limit the maximum range under 3,500m (HEI-T and TP-T maximum range ~ 6,000m)

The 25mm x 137 TPRR-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert shell
- A day/night tracer

### TECHNICAL DATA

Type	Target Practice Reduced Range with Tracer (TPRR-T)
Calibre	25mm
Cartridge weight	~ 500g
Cartridge length	≤ 220mm
Projectile weight	183g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant (nominal)	~ 90g
Link	M28

### PERFORMANCE

Initial velocity	1,100m/s
Operational use	2,000m
Dispersion	$\sigma_H$ and $\sigma_V \leq 0.8$ mils
Tracer duration	≥ 1.8s

### PACKAGING

Metallic box CMC30 H200
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### STATUS

In service

# 25mm x 137 TPFSDS-T

**M937**

**MISSION**

This cartridge is designed to be fired, for gunnery training, from the 25mm KBA, M242 Bushmaster and 25mm Nexter M811 gun systems.

**DESCRIPTION**

This cartridge is a Target Practice Fin Stabilized Discarding Sabot projectile with Tracer (TPFSDS-T) type. It consists of a subcalibre fin stabilized steel projectile launched by means of a lightweight sabot. The tracer element is contained within the aluminium alloy tail. The

projectile is ballistically similar to the standard APFSDS ammunition to a range of 1,000 meters. It has a maximum range of less than 4,500 meters.

**TECHNICAL DATA**

Type	Fixed round, TPFSDS-T
Calibre	25mm
Round mass (nominal)	450g
Round length	223mm
Projectile mass (nominal)	112g
Penetrator	Steel
Tracer (static)	Min 2.4s
Cartridge case	Steel
Primer	Percussion cap DM 8242
Propellant SB (nominal)	95g

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	1,440m/s
Maximum range	<4,500m
Dispersion	0.7 Mils
Operational temperature	-32°C to +62°C

**PACKAGING**

15 rounds on a belt, and 2 belts per weatherproof metal container
28 containers per pallet
<b>UN Classification : 1.2 C UN 0328</b>

**STATUS**

In service

# 20mm x 139 HEI

## 20mm AMMUNITION



### MISSION

The 20mm x 139 ammunition is intended for use in the KAD / 20HS820, GI-2 ,20RH202, 20M693 automatic weapons fitted to anti-aircraft, light armoured vehicles and naval vessels (15B and Narwhal 20B) mounts

### DESCRIPTION

The 20 x 139 HEI cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An explosive shell loaded with RDX/aluminium
- A point detonating fuze equipped with two safety systems and self-destruction

### TECHNICAL DATA

Type	High-Explosive Incendiary (HEI)
Calibre	20mm
Cartridge weight	~ 315g
Cartridge length	≤ 213mm
Projectile weight	120g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Fuze	MR201B Self-destruction : 3,5 to 8 s Safety distance : ≥ 15m
Propellant	~ 55g
Explosive	~9g
Link	24K711

### PERFORMANCE

Initial velocity	1,050m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m

### PACKAGING

Box	Metallic box 12D201
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### STATUS

In service

# 20mm x 139 HEI-T

## 20mm AMMUNITION



### MISSION

The 20mm x 139 ammunition is intended for use in the KAD / 20HS820, GI-2 ,20RH202, 20M693 automatic weapons fitted to anti-aircraft, light armoured vehicles and naval vessels (15B and Narwhal 20B) mounts.

### DESCRIPTION

The 20 x 139 HEI-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An explosive shell loaded with RDX/aluminium
- A point detonating fuze equipped with two safety systems and self-destruction
- A day/night tracer

### TECHNICAL DATA

Type	High-Explosive Incendiary Tracer (HEI-T)
Calibre	20mm
Cartridge weight	~ 315g
Cartridge length	≤ 213mm
Projectile weight	120g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Fuze	MR201B Self-destruction : 3,5 to 8s Safety distance : ≥ 15m
Propellant	~ 55g
Explosive weight	~ 6g
Link	24K711

### PERFORMANCE

Initial velocity	1,050m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m
Tracer duration	≥ 3.5s

### PACKAGING

Box	Metallic box 12D201
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### STATUS

In service

# 20mm x 139 AP-T

## 20mm AMMUNITION



### MISSION

The 20mm x 139 ammunition is intended for use in the KAD / 20HS820, GI-2 ,20RH202, 20M693 automatic weapons fitted to anti-aircraft, light armoured vehicles and naval vessels (15B and Narwhal 20B) mounts.

### DESCRIPTION

The 20 x 139 AP-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band equipped with an armour-piercing core of high heavy metal
- A day/night tracer

### TECHNICAL DATA

Type	Armour Piercing with Tracer (AP-T)
Calibre	20mm
Cartridge weight	~ 305g
Cartridge length	≤ 213mm
Projectile weight	111g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~ 55g
Link	24K711

### PERFORMANCE

Initial velocity	1,100m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m
Penetration RHA (thickness/angle/distance)	26mm/30°/800m
Tracer duration	≥ 1.5s

### PACKAGING

Box	Metallic box 12D201
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### STATUS

In service

# 20mm x 139 TP

## 20mm AMMUNITION



### MISSION

The 20mm x 139 ammunition is intended for use in the KAD / 20HS820, GI-2, 20RH202, 20M693 automatic weapons fitted to anti-aircraft, light armoured vehicles and naval vessels (15B and Narwhal 20B) mounts.

### DESCRIPTION

The 20 x 139 TP cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band

### TECHNICAL DATA

Type	Target Practice (TP)
Calibre	20mm
Cartridge weight	~ 315g
Cartridge length	≤ 213mm
Projectile weight	120g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~ 55g
Link	24K711

### PERFORMANCE

Initial velocity	1,050m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m

### PACKAGING

Box	Metallic box 12D201
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### STATUS

In service

# 20mm x 139 TP-T

## 20mm AMMUNITION



### MISSION

The 20mm x 139 ammunition is intended for use in the KAD / 20HS820, GI-2 ,20RH202, 20M693 automatic weapons fitted to anti-aircraft, light armoured vehicles and naval vessels (15B and Narwhal 20B) mounts.

### DESCRIPTION

The 20 x 139 TP-T cartridge is composed of:

- A steel cartridge case
- A mechanical primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band
- A day/night tracer

### TECHNICAL DATA

Type	Target Practice with Tracer (TP-T)
Calibre	20mm
Cartridge weight	~ 315g
Cartridge length	≤ 213mm
Projectile weight	120g
Cartridge case	Steel (lacquering protection)
Primer	Mechanical
Propellant	~ 55g
Link	24K711

### PERFORMANCE

Initial velocity	1,050m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m
Tracing duration	≥ 3.5s

### PACKAGING

Box	Metallic box 12D201
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### STATUS

In service

# 20mm x 102 HEI

## 20mm AMMUNITION



### MISSION

The 20mm x 102 ammunition is compliant with international standards and has been particularly designed for use with the Nexter's 20M621 automatic cannon. Fitted to the 15A mounts for vehicles and naval patrol boats, in the NC 621 cannon pod for helicopters and light fixed-wing aircraft, on 19A door mounts and 22A/23A coaxial mounts for helicopter, SH20 inboard mount, THL20 turret for helicopter, Narwhal system and ARX20A.

### DESCRIPTION

The 20 x 102 HEI cartridge is composed of:

- A brass cartridge case (M103 type)
- An electric primer
- A propellant load adapted to thermal conditions
- An explosive shell loaded with RDX/aluminium
- A point detonating fuze equipped with two safety systems and self-destruction

### TECHNICAL DATA

Type	High-Explosive Incendiary (HEI)
Calibre	20mm
Cartridge weight	~ 260g
Cartridge length	≤ 168mm
Projectile weight	102g
Cartridge case	Brass
Fuze	MR 221 Safety distance: ≥ 15m Self-destruction: 3.5s to 9s
Primer	Electric M52A3B1
Explosive	9g
Propellant	~ 36g
Link	23TE711

### PERFORMANCE

Initial velocity	975m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m

### PACKAGING

Box	Wooden box 02D101 or metallic box M548
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### STATUS

In service

# 20mm x 102 AP-T

## 20mm AMMUNITION



### MISSION

The 20mm x 102 ammunition is compliant with international standards and has been particularly designed for use with the Nexter's 20M621 automatic cannon. Fitted to the 15A mounts for vehicles and naval patrol boats, in the NC 621 cannon pod for helicopters and light fixed-wing aircraft, on 19A door mounts and 22A/23A coaxial mounts for helicopter, SH20 inboard mount, THL20 turret for helicopter, Narwhal system and ARX20A.

### DESCRIPTION

The 20 x 102 AP-T cartridge is composed of:

- A brass cartridge case (M103 type)
- An electric primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band equipped with an armour-piercing core of high heavy metal
- A day/night tracer

### TECHNICAL DATA

Type	Armour Piercing with Tracer (AP-T)
Calibre	20mm
Cartridge weight	~272g
Cartridge length	≤ 168mm
Projectile weight	~120g
Cartridge case	Brass
Primer	Electric M52A3B1
Propellant	~36g
Link	23TE711

### PERFORMANCE

Initial velocity	1,005m/s
Operational use	1,500m
Accuracy	H + L ≤ 60cm at 200m
Tracing duration	≥1.6s

### PACKAGING

Box	Wooden box 02D101 or metallic box M548
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### STATUS

In service

# 20mm x 102 TP

## 20mm AMMUNITION



### MISSION

The 20mm x 102 ammunition is compliant with international standards and has been particularly designed for use with the Nexter's 20M621 automatic cannon. Fitted to the 15A mounts for vehicles and naval patrol boats, in the NC 621 cannon pod for helicopters and light fixed-wing aircraft, on 19A door mounts and 22A/23A coaxial mounts for helicopter, SH20 inboard mount, THL20 turret for helicopter, Narwhal system and ARX20A.

### DESCRIPTION

The 20 x 102 TP cartridge is composed of:

- A brass cartridge case (M103 type)
- An electric primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band

### TECHNICAL DATA

Type	Target Practice (TP)
Calibre	20mm
Cartridge weight	~260g
Cartridge length	~168g
Projectile weight	102g
Cartridge case	Brass
Primer	Electric M52A3B1
Propellant	~36g
Link	23TE711

### PERFORMANCE

Initial velocity	975m/s
Operational use	up to 2,000m
Accuracy	H + L ≤ 60cm at 200m

### PACKAGING

Box	Wooden box 02D101 or metallic box M548
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### STATUS

In service

# 20mm x 102 TP-T

## 20mm AMMUNITION



### MISSION

The 20mm x 102 ammunition is compliant with international standards and has been particularly designed for use with the Nexter's 20M621 automatic cannon. Fitted to the 15A mounts for vehicles and naval patrol boats, in the NC 621 cannon pod for helicopters and light fixed-wing aircraft, on 19A door mounts and 22A/23A coaxial mounts for helicopter, SH20 inboard mount, THL20 turret for helicopter, Narwhal system and ARX20A.

### DESCRIPTION

The 20 x 102 TP-T cartridge is composed of:

- A brass cartridge case
- An electric primer
- A propellant load adapted to thermal conditions
- An inert shell fitted with a sintered-iron driving band
- A day/night tracer

### TECHNICAL DATA

Type	Target Practice with Tracer (TP-T)
Calibre	20mm
Cartridge weight	~260g
Cartridge length	~168g
Projectile weight	102g
Cartridge case	Brass
Primer	Electric M52A3B1
Propellant	~36g
Link	23TE711

### PERFORMANCE

Initial velocity	975m/s
Operational use	1,500m
Accuracy	H + L ≤ 60cm at 200m
Tracing duration	≥2s

### PACKAGING

Box	Wooden box 02D101 or metallic box M548
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### STATUS

In service

# Mechanical Medium-Calibre Fuzes



**MR221** - 20x102 HEI - ARAVIS  
Guns: 20M621 - M 39



**MR201B** - 20x139 HEI & HEI-T  
Guns: 20M693 - 20 RH 202 - 20 KAD - GI2



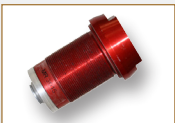
**MR251** - 25x137mm HEI-T - VBCI  
Guns: 25M811 - 25 M 242 - GAU 12 - 25 ADEN - 25 KBA



**MR3001** - 30x113 ADEN type HEI - Jaguar  
Guns: 30 ADEN - 30M230



**MR3005** - 30x113mm SAPHEI - Tiger - Mirage 2000  
Guns: 30M550 and 30M781



**MR3015** - 30mmx150 SAPHEI - Rafale  
Gun: 30M791



**MR4015** - 40mm GPR-PD - Warrior - EBRC

# Mechanical Medium-Calibre Fuzes



## MISSION

The mechanical medium-calibre fuzes from Nexter Munitions are safety devices designed for the storage, manipulation, and muzzle safety of high explosive and incendiary projectiles. The safety and arming functions of the fuzes are assured by environmental stresses during firing.

## TECHNICAL DATA

	Conformity with STANAG 4187	Muzzle safety	Insensitivity	Sensitivity	Delayed operation	Firing temperature (safety)	Self-destruction
MR201B	-	15m	Aluminum target, 0.2mm thick	Aluminum target, 0.8mm thick	-	-54°C +74°C	Yes
MR221	-	15m	Aluminum target, 0.2mm thick	Aluminum target, 0.8mm thick	-	-54°C +74°C	Yes
MR251	No (STANAG 4173)	15m	Aluminum target, 0.2mm thick	Aluminum target, 2mm thick	-	-50°C +70°C	Yes
MR3001	-	15m	Aluminum target, 0.5mm thick	Aluminum target, 1mm thick	-	-60°C +100°C	-
MR3005	(Yes, for MR3005S)	20m		Aluminum target, 3mm thick	Yes	-60°C +100°C	Yes
MR3015	Yes	15m		Aluminum target, 3mm thick	Yes	-60°C +100°C	Yes
MR4015	Yes	15m		Aluminum target, 3mm thick	Yes	-46°C +63°C	Yes

## STATUS

In service



# Infantry Ammunition



# 106mm RCL HEAT-T

**M1070**

**MISSION**

For use with 106mm recoilless rifle, to defeat armoured fighting vehicles, bunkers and hard targets. This round replaces the US M344 model type, and has improved fuze and explosive filling. A ballistically matched training round is also available.

**DESCRIPTION**

The steel nose cone adapter of the projectile carries a cap with a piezoelectric element to initiate the PIBD fuze in the base. The fuze has two independent safety devices to ensure safety during handling, storage and transport. It

also functions in graze mode to ensure functioning at all impact angles. A copper cone within the projectile generates the shaped charge effect. The explosive charge is Composition B. In the event of a non-functioning, the fuze will discharge all electrical power and be rendered inert within 10 minutes of firing.

**TECHNICAL DATA**

Type	Fixed round HEAT-T
Calibre	106mm
Round mass (nominal)	16.4kg
Round length	999mm
Projectile mass (nominal)	8.3kg
Projectile filling (Comp B)	1.0 kg
Fuze	PIBD
Tracer	M84
Cartridge case	Perforated steel
Primer	Percussion cap M61
Propellant DB (nominal)	3.7kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	500m/s
Dispersion	0.8 Mils
Maximum range	2,750m
Penetration (at 60° obliquity)	150mm
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

**STATUS**

In service

# 106mm RCL HEAT-TP-T

**M1071**

**MISSION**

For use with 106mm recoilless rifle, to provide cost effective marksmanship and live fire training of gun crews. This round is ballistically matched to the M1070 HEAT-T projectile.

**DESCRIPTION**

The projectile consists of a steel body with the same physical characteristics as the M1070 HEAT-T projectile. A tail fin assembly with tracer is mounted on the rear of the body. The projectile is assembled to the steel perforated cartridge case and has a mechanically initiated primer.

**TECHNICAL DATA**

Type	Fixed round HEAT-TP-T
Calibre	106mm
Round mass (nominal)	16.4kg
Round length	999mm
Projectile mass (nominal)	8.3kg
Projectile filling	Inert
Tracer	M84
Cartridge case	Perforated steel
Primer	Percussion cap M61
Propellant DB (nominal)	3.7kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	500m/s
Dispersion	0.8 Mils
Maximum range	2,750m
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container, 12 containers per pallet

Gross weight (container)	43kg
Dimension ext (container)	1100 x 410 x 200mm
Gross weight (complete pallet)	565kg
Dimension ext (complete pallet)	1200 x 1100 x 910mm
UN Classification: 1.2 C UN 0328)	

**STATUS**

In service

# 106mm RCL HESH-T

**M1072**

**MISSION**

For use with 106mm recoilless rifle, optimized for Urban Warfare to defeat armoured fighting vehicles, bunkers and reinforced concrete structures, hard targets, personnel and similar targets. This round replaces the US M346 model type, and has improved explosive filling and improved fuzing. A ballistically matched training round is available.

**DESCRIPTION**

The HESH-T (HEP-T) projectile comprises a thin walled steel cylindrical body with a pre-machined driving band, a relatively short ogive and a flat base to which is secured the base detonating fuze and a tracer. It is loaded with Composition A3 explosive. The projectile is assembled to a steel cartridge case fitted with a mechanical primer and loaded with double base, multi perforated propelling charge. The new base detonating fuze has two independent safety mechanisms, improved muzzle safety and improved graze performance. In the event of a non-function after firing, the firing pin will be mechanically locked. The fuze complies with STANAG 4187 and MIL-STD-1316D.

**TECHNICAL DATA**

Type	Fixed round HESH-T
Calibre	106mm
Round mass (nominal)	17kg
Round length	960mm
Projectile mass (nominal)	8.0kg
Projectile filling(Comp A3)	3.5kg
Fuze	BD7602
Tracer	M87
Cartridge case	Perforated steel
Primer	Percussion cap M61
Propellant DB (nominal)	3.8kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	500m/s
Dispersion	0.8 Mils
Effective range	1,350m
Maximum range	6,800 m
Operational temperature	-32°C to +52°C

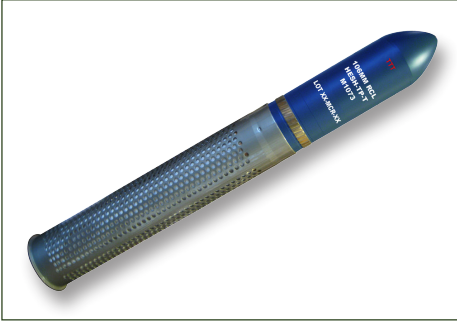
**PACKAGING**

2 rounds per twin container
12 containers per pallet
UN Classification: 1.1 E UN 0006

**STATUS**

In service

# 106mm RCL HESH-TP-T

**M1073**

**MISSION**

For use with the 106mm recoilless rifle, to provide cost effective marksmanship and live fire training of gun crews. This round is ballistically matched to the M1072 HESH-T projectile.

**DESCRIPTION**

The HESH-TP-T (HEP-TP-T) projectile comprises a steel cylindrical body with a pre-machined driving band, a relatively short ogive and a flat base to which is secured the base tracer. The projectile is assembled to a steel cartridge case

fitted with a mechanical primer and loaded with double base, multi perforated propelling charge.

**TECHNICAL DATA**

Type	Fixed round HESH-TP-T
Calibre	106mm
Round mass (nominal)	16.4kg
Round length	960mm
Projectile mass (nominal)	8.1kg
Tracer	M87
Cartridge case	Perforated steel
Primer	M57
Propellant DB (nominal)	3.7kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	500m/s
Dispersion	<0.8 Mils
Range, Direct fire	1,350m
Range, Indirect fire	6,800 m
Operational temperature	-32°C to +52°C

**PACKAGING**

2 rounds per twin container
12 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

**STATUS**

In service

# Sub-Calibre Adapter

**M1076**

**MISSION**

For use with current 106mm recoilless rifle M40A1, for gunnery training.

**DESCRIPTION**

The sub-calibre adapter M1076 is a sub-calibre system used for gun crew training. It consists of a Training Device comprising a 7.62mm rifled barrel in a mount having the shape of a 106mm HESH round. 7.62 rounds are loaded in the Adapter to be fired from the 106mm rifle out to the combat range of full bore rounds. The sub-calibre adapter is loaded into the rifle chamber

and is fired using the main rifle firing mechanism. Requiring minimum routine maintenance, it provides a complete and inexpensive training system.

**TECHNICAL DATA**

Calibre	106mm
Round mass (nominal)	16kg
Round length	920mm

**SUB-CALIBRE**

Calibre	7.62mm
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**PACKAGING**

1 round per container, 2 containers per wooden box
12 wooden boxes per pallet

**STATUS**

In service

# 84mm Sub-Calibre Training Device

## M525



### MISSION

For use with current 84mm recoilless rifles, such as the Carl Gustav & M560A1 SAKR, for gunnery training.

### DESCRIPTION

The sub-calibre adapter M525 is a sub-calibre system used for rifle crew training. It consists of a Training Device comprising a 7.62mm rifled barrel in a mount having the shape of an 84mm round. M115 7.62 tracer rounds are loaded into the adapter to be fired from the 84mm rifle out to the combat range of

full-bore rounds. The sub-calibre adapter is loaded into the rifle chamber and is fired using the main rifle firing mechanism. Requiring minimum routine maintenance, it provides a complete and inexpensive training system.

### TECHNICAL DATA

Type	Sub-calibre
Calibre	84mm
Round mass (nominal)	3.7kg
Round length	600mm
Sub-calibre barrel	Calibre 7.62mm
Projectile	FN Tracer Round M115
Cap and holder ass	M573
Primer	Flobert 6mm blank cartridge

### PERFORMANCE

Ballistic match with HEAT round	To 300m
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### PACKAGING

2 rounds per twin container
3 containers per wooden box, 8 wooden boxes per pallet

### STATUS

In service

# 84mm HE

## M540



### MISSION

For use with 84mm recoilless rifle M560A1 and equivalents, to provide blast and fragmentation effects for the defeat of light structures, material and similar targets.

### DESCRIPTION

The projectile consists of a high fragmentation cast iron body containing a HE bursting charge. It has a copper driving band and a multi-purpose time fuze. The fuze can be set to range and will also function in PD Mode. It is assembled to a light weight aluminium cartridge which is fitted

with a percussion cap, an ignition charge and a blow-out disc. The cartridge case is loaded with a double base strip propellant.

### TECHNICAL DATA

Type	Fixed round, HE
Calibre	84mm
Round mass (nominal)	3.3kg
Round length	370mm
Projectile mass (nominal)	2.4kg
Projective filling (Comp B)	0.4kg
Fuze	PD/Time
Cartridge case	Aluminium
Primer	Percussion cap
Propellant DB (nominal)	0.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	240m/s
Muzzle safety	20m
Arming distance	70m
Dispersion	1 Mills
Effective Range	1,300m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 84mm SMK (TTC)

## M541



### MISSION

For use with 84mm recoilless rifle M560A1 and equivalents, to provide instant tactical non toxic screening smoke.

### DESCRIPTION

The projectile consists of a light alloy body with a copper driving band, the adapter with the PD/Graze fuze. It is filled with Titanium Tetra Chloride (TTC) and fitted with a Composition A5 burster charge. It is assembled to a light weight aluminium cartridge which is fitted with a percussion cap, an ignition charge and a blow-

base strip propellant.

### TECHNICAL DATA

Type	Fixed round SMK
Calibre	84mm
Round mass (nominal)	3.2kg
Round length	440mm
Projectile mass (nominal)	2.3kg
Projective filling (TTC)	0.5kg
Burster (Comp A5)	0.02kg
Fuze	PD/Graze
Cartridge case	Aluminium
Primer	Percussion cap
Propellant DB (nominal)	0.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	240m/s
Muzzle safety	20m
Arming distance	70m
Dispersion	2 Mils
Effective Range	1,300m
Smoke screen	15m width
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 G UN 0015</b>

### STATUS

In service

# 84mm ILL

## M542



### MISSION

For use with 84mm recoilless rifle M560A1 and equivalents, to provide tactical illumination of a specific area of operation.

### DESCRIPTION

The projectile consists of a light alloy body with a copper driving band, a base plate held by six shear pins and a pyrotechnical fuze. The illuminating canister and parachute assembly is loaded in the projectile body. It is assembled to a light weight aluminium cartridge which is fitted with a percussion cap, an ignition charge

and a blow-out disc. The cartridge case is loaded with a double base strip propellant.

### TECHNICAL DATA

Type	Fixed round ILL
Calibre	84mm
Round mass (nominal)	3.2kg
Round length	465mm
Projectile mass (nominal)	2.3kg
Projective filling (illuminating comp)	0.5kg
Fuze	Pyrotechnical
Cartridge case	Aluminium
Primer	Percussion cap
Propellant (nominal)	0.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	260m/s
Range to burst - max	1,800m
Range to burst - min	600m
Burst height	200m
Descent rate	+/-5m/s
Illuminated rate - period	Approx 30s
Illuminated rate - intensity	650,000cd
Illuminated area (diameter)	400-500m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 G UN 0171</b>

### STATUS

In service

# 84mm HEAT

## M543



### MISSION

For use with 84mm recoilless rifle M560A1 and equivalents to defeat armoured fighting vehicles and hard targets utilizing a shaped charge.

### DESCRIPTION

The projectile consists of an aluminium alloy nose cone and an aluminium alloy body, which contains the shaped charge, the electronic BD fuze, the rocket motor and the delay ignitor. The projectile has a nylon slip obturator and is stabilized by 6 hinged fins, which deploy upon

exit from the rifle. The projectile is assembled to a light weight aluminium cartridge which is fitted with a percussion cap, an ignition charge and a blow-out disc. The cartridge case is loaded with a double base strip propellant.

### TECHNICAL DATA

Type	Fixed round HEAT
Calibre	84mm
Round mass (nominal)	3.4kg
Round length	610mm
Projectile mass (nominal)	2.5kg
Projective filling (Comp A3)	0.5kg
Fuze	Electronic BD
Cartridge case	Aluminium
Primer	Percussion cap
Propellant DB (nominal)	0.4kg
Rocket motor	0.3kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	255m/s
Maximum velocity	+/-340m/s
Muzzle safety	15m
Arming distance	30m
Dispersion	1 Mils
Effective range	600m
Penetration	300mm RHA
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.1 E UN 0006</b>

### STATUS

In service

# 84mm HEAT-TP

## M552



### MISSION

For use with 84mm recoilless rifle M560A1 and equivalents to provide live fire crew training.

### DESCRIPTION

The projectile consists of an aluminium alloy nose cone and an aluminium alloy body, which contains the rocket motor and the delay ignitor. The projectile has a nylon slip obturator and is stabilized by 6 hinged fins, which deploy upon exit from the rifle. The projectile is assembled to a light weight aluminium cartridge which is fitted with a percussion cap, an ignition charge

and a blow-out disc. The cartridge case is loaded with a double base strip propellant. This round is ballistically matched to the HEAT M543.

### TECHNICAL DATA

Type	Fixed round HEAT-TP
Calibre	84mm
Round mass (nominal)	3.3kg
Round length	610mm
Projectile mass (nominal)	2.4kg
Projective filling	Inert
Rocket motor	0.3kg
Cartridge case	Aluminium
Primer	Percussion cap
Propellant SB (nominal)	0.4kg

### PERFORMANCE

Muzzle velocity (at 21°) (nominal)	255m/s
Maximum velocity	+/-340m/s
Dispersion	1 Mils
Effective range	600m
Operational temperature	-32°C to +62°C

### PACKAGING

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

### STATUS

In service

# 84mm Canister

**M587**

**MISSION**

For use with the 84mm recoilless rifles M560A1 and equivalents against personnel at close quarters.

**DESCRIPTION**

The thin walled cylindrical body is loaded with steel pellets and is fitted with a base plug. When fired, the projectile breaks open, upon leaving the muzzle, and projects the steel pellets in a cone with an effective range of approximately 100 meters.

The projectile is fixed on an aluminium cartridge case, which contains a double base multi-perforated propellant and is fitted with a mechanical primer.

**TECHNICAL DATA**

Type	Fixed round Canister
Calibre	84mm
Round mass (nominal)	3.6kg
Round length	350mm
Projectile mass (nominal)	2.2kg
Fragments (Ø13mm steel spheres)	+/- 190 spheres
Fragments weight	1.6kg
Cartridge case	Aluminium
Primer	Percussion cap
Propellant DB (nominal)	0.4kg

**PERFORMANCE**

Muzzle velocity (at 21°) (nominal)	260m/s
Effective range	100m
Operational temperature	-32°C to +62°C

**PACKAGING**

2 rounds per twin container
36 containers per pallet
<b>UN Classification: 1.2 C UN 0328</b>

**STATUS**

In service

# 40x46mm LV HE-FRAG-SD IM



## MISSION

The Simmel Difesa 40x46mm LV HE-FRAG-SD IM is an impact grenade, designed to be highly insensitive and lethal in the target area up to 10m from the impact point. It acts by means of simultaneous blast and fragmentation effects. It can be fired by any low velocity (LV) grenade launchers

## DESCRIPTION

The grenade projectile, is fitted with an insensitive and high explosive charge operated by a dual-safety fuze fully complying with MIL-

STD-1316. The projectile is assembled with an aluminium cartridge case, filled with a double base propellant and fitted with a percussion capsule. The grenade design ensures a high level of insensitivity (between level V and level VI, STANAG 4439). A HE-FRAG-SD (no IM) version with the same performances and ballistics of the is available.

## TECHNICAL DATA

Type	Fixed round HE-FRAG-SD IM
Calibre	40mm
Round mass (nominal)	280g
Round length (nominal)	123mm
Projectile mass (nominal)	210g
Projectile filling (nominal)	44g - PBX based
Fuze	PD with SD
Fragments	Steel
Cartridge case	Aluminum
Primer	Percussion
Propellant	Double base

## PERFORMANCE

Muzzle velocity at 21°C	78m/s
Fragmentation effect	Lethal up to 10m
Maximum range	430m
Operational temperature	-46°C to +63°C

## PACKAGING

No. 18 grenades in a M2A1 metal box.
No. 84 metal boxes per pallet.
<b>UN Classification: 1.1E UN0006</b>

## STATUS

In service

# 40x46mm LV EB-SD IM



## MISSION

The Simmel Difesa 40x46mm LV EB-SD IM is an impact grenade, designed to be highly insensitive and lethal in the target area up to 5m from the impact point. It acts by means of an enhanced blast. It can be fired by any low velocity (LV) grenade launchers.

## DESCRIPTION

The grenade projectile is fitted with an insensitive and high explosive charge operated by a dual-safety fuze fully complying with MIL-

STD-1316. The projectile is assembled with an aluminium cartridge case, which is filled with a double base propellant and fitted with a percussion capsule. The grenade design ensures a high level of insensitivity (between level V and level VI, STANAG 4439).

## TECHNICAL DATA

Type	fixed round EB-SD IM
Calibre	40mm
Round mass (nominal)	280g
Round length (nominal)	123mm
Projectile mass (nominal)	210g
Projectile filling (nominal)	68g
Fuze	PD with SD
Cartridge case	Aluminum
Primer	Percussion
Propellant	Double base

## PERFORMANCE

Muzzle velocity at 21°C	78m/s
Fragmentation effect	Lethal up to 5m
Maximum range	430m
Operational temperature	-46°C to +63°C

## PACKAGING

No. 18 grenades in a M2A1 metal box.

No. 84 metal boxes per pallet.

UN Classification: 1.1E UN0006

## STATUS

In service

# 40x46mm LV HE-DP-SD IM



## MISSION

The Simmel Difesa 40x46mm HEDP-SD IM is an impact grenade, designed to penetrate over 80mm of steel and to be lethal in the target area up to 10m from the impact point by means of simultaneous blast and fragmentation effects. It can be fired by any low velocity (LV) grenade launchers.

## DESCRIPTION

The grenade projectile is fitted with a shaped charge and a dual-safety fuze fully complying with MIL-STD-1316. The projectile is assembled with an aluminium cartridge case, filled with a double base propellant and fitted with a percussion capsule. The grenade design ensures a high level of insensitivity (between level V and level VI, STANAG 4439). A HEDP-SD (non IM) version with the same performances and ballistics of the IM one is available.

## TECHNICAL DATA

Type	fixed round HEDP-SD IM
Calibre	40mm
Round mass (nominal)	280g
Round length (nominal)	123mm
Projectile mass (nominal)	210g
Projectile filling (nominal)	32g - PBX based
Fuze	PD with SD
Fragments	Steel
Cartridge case	Aluminum
Primer	Percussion
Propellant	Double base

## PERFORMANCE

Muzzle velocity at 21°C	78m/s
Penetration capability	up to 80mm of steel
Fragmentation effect	Lethal up to 10m
Maximum range	430m
Operational temperature	-46°C to +63°C

## PACKAGING

No. 18 grenades in a M2A1 metal box.
No. 84 metal boxes per pallet.
<b>UN Classification: 1.1E UN0006</b>

## STATUS

In service

# 40x46mm LV TPM



## MISSION

The Simmel Difesa 40x46mm TPM is a Target Practice Marker grenade that produces a visible signature upon impact. It has the same ballistic of the HE (High Explosive) versions and is designed for practice or for proof testing weapons. The Simmel Difesa 40x46mm TP can be fired by any low velocity (LV) grenade launchers.

## DESCRIPTION

The inert Target Practice Marker projectile is loaded with orange dye powder and it is

assembled with an aluminium cartridge case filled with a double base propellant and fitted with a percussion capsule.

## TECHNICAL DATA

Type	Fixed round TPM
Calibre	40mm
Round mass (nominal)	280g
Round length (nominal)	123mm
Projectile mass (nominal)	210g
Projectile	Inert
Marker	Orange Dye
Cartridge case	Aluminum
Primer	Percussion
Propellant	Double base

## PERFORMANCE

Muzzle velocity at 21°C	78m/s
Maximum range	430m
Operational temperature	-46°C to +63°C

## PACKAGING

No. 18 grenades in a M2A1 metal box
No. 84 metal boxes per pallet.
<b>UN Classification: 1.2C UN0328</b>

## STATUS

In service

# 40x46mm LV TP



## MISSION

The Simmel Difesa 40x46mm TP grenade has the same ballistic of the HE (High Explosive) versions and is designed for practice or proof testing weapons. The Simmel Difesa 40x46mm TP can be fired by any low velocity (LV) grenade launchers.

## DESCRIPTION

The Target Practice projectile is assembled with an aluminium cartridge case filled with a double base propellant and fitted with a percussion capsule.

## TECHNICAL DATA

Type	Fixed round TP
Calibre	40mm
Round mass (nominal)	280g
Round length (nominal)	123mm
Projectile mass (nominal)	210g
Projectile	Inert
Cartridge case	Aluminum
Primer	Percussion
Propellant	Double base

## PERFORMANCE

Muzzle velocity at 21°C	78m/s
Maximum range	430m
Operational temperature	-46°C to +63°C

## PACKAGING

No. 18 grenades in a M2A1 metal box.

No. 84 metal boxes per pallet.

**UN Classification: 1.2C UN0328**

## STATUS

In service

# 35mm RFL GREN BTU HEDP

## M200



### MISSION

The HEDP 35mm rifle grenade is designed for use with 5.56 and 7.62 calibre assault rifles, to provide a safe, accurate and effective direct and indirect fire capability. The grenade can be used against enemy personnel, urban targets and light armoured vehicles.

### DESCRIPTION

The HEDP 35mm rifle grenade consists of a warhead with a double-safety fuze in accordance with STANAG 4187. The warhead consists of an HE filled fragmented steel body and a small copper cone providing an additional

anti-armour shaped charge effect. Mecar's patented and well-proven bullet trap fitted in the tail assembly allows the grenade to be fired by any standard military (5.56mm and 7.62mm) rifle with a 22mm diameter muzzle. A semi-active version M232 and a reusable training version M230 with the same characteristics are also available.

### TECHNICAL DATA

<b>Calibre</b>	35mm
<b>Round mass (nominal)</b>	440g
<b>Round length</b>	343mm
<b>Explosive (Comp A3)</b>	38g
<b>Fuze</b>	BD fuze electromechanical
<b>Aiming grid</b>	Provided with grenade for specific rifle
<b>Bullet trap</b>	Universal for all types of 5.56 & 7.62 ammunition

### PERFORMANCE

<b>Operation range (direct fire)</b>	150m* - 300m**
<b>Maximum range (indirect fire)</b>	300m* - 450m**
<b>Launch velocity</b>	55m/s* - 75m/s**
<b>Lethal radius</b>	>8m
<b>Penetration against RHA at 0° impact</b>	>75mm
<b>Dispersion</b>	0,25m
<b>Muzzle safety</b>	>5m
<b>Arming distance</b>	<20m
<b>Operational temperature</b>	-32°C to +52°C

\*nominal 5.56mm. \*\*nominal 7.62mm.

### PACKAGING

Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet.

<b>Gross weight (wooden box)</b>	23kg
<b>Dimension ext (wooden box)</b>	460 x 340 x 360mm
<b>Gross weight (complete pallet)</b>	325kg
<b>Dimension ext (complete pallet)</b>	1020 x 1000 x 870mm
<b>UN Classification: 1.1 D UN 0284</b>	

### STATUS

In service

# 35mm RFL GREN BTU HEDP PRAC

## M232



### MISSION

The HEDP PRAC 35mm rifle grenade is designed for use with 5.56 and 7.62 calibre assault rifles, to train the soldier to use the HEDP rifle grenade M200.

### DESCRIPTION

The HEDP PRAC 35mm rifle grenade consists of a semi-active version of M200 Grenade using a flash and bang composition to simulate the impact effect. Mecar's patented and well-proven bullet trap fitted in the tail assembly allows the grenade to be fired by any standard

military (5.56mm and 7.62mm) rifle with a 22mm diameter muzzle.

### TECHNICAL DATA

Calibre	35mm
Round mass (nominal)	440g
Round length	343mm
Projectile filling	Flash & bang composition
Aiming grid	Provided with grenade for specific rifle
Bullet trap	Universal for all types of 5.56 & 7.62 ammunition

### PERFORMANCE

Operation range (direct fire)	150m* - 300m**
Maximum range (indirect fire)	300m* - 450m**
Launch velocity	55m/s* - 75m/s**
Dispersion	0.25m
Operational temperature	-32°C to +52°C

\*nominal 5.56mm. \*\*nominal 7.62mm.

### PACKAGING

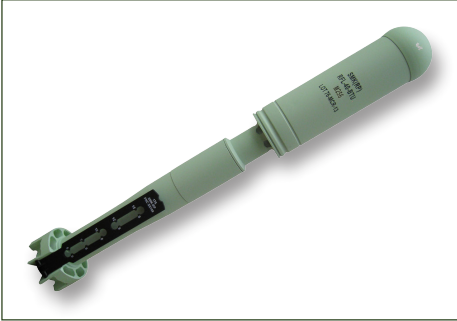
Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet.

Gross weight (wooden box)	25kg
Dimension ext (wooden box)	460 x 340 x 360mm
Gross weight (complete pallet)	325kg
Dimension ext (complete pallet)	1020 x 1000 x 870mm
UN Classification: 1.3 G UN 0318	

### STATUS

In service

# 40mm RFL GREN SMK(RP)

**M256**

**MISSION**

The Smoke (RP) rifle grenade is designed for use with 5.56 and 7.62 calibre assault rifles to produce a persistent, opaque, highly intense white smoke for spotting or screening effects..

**DESCRIPTION**

The 40mm Smoke (RP) rifle grenade consists of a Red Phosphorus canister assembly, mounted on Mecar's patented and well-proven bullet trap fitted in the tail assembly of the grenade. It allows the grenade to be fired by any standard military (5.56mm and 7.62mm) rifle with a

22mm diameter muzzle. When fired, the canister is initiated at impact and produces white smoke with screening effect in the visible and infrared spectrum.

**TECHNICAL DATA**

<b>Calibre</b>	40mm
<b>Round mass (nominal)</b>	490g
<b>Round length</b>	360mm
<b>Ignition</b>	At impact
<b>Red phosphorus charge</b>	160g
<b>Aiming grid</b>	Provided with grenade for specific rifle
<b>Bullet trap</b>	Universal for all types of 5.56 & 7.62 ammunition

**PERFORMANCE**

<b>Operation range (direct fire)</b>	175m
<b>Maximum range (indirect fire)</b>	250m
<b>Launch velocity*</b>	55m/s
<b>Smoke duration</b>	40s
<b>Typical dimension of smoke screen with one grenade (good weather conditions)</b>	20m x 10m
<b>Operational temperature</b>	-32°C to +52°C

\*nominal 5.56mm.

**PACKAGING**

Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet - Marking to NATO Standards

**UN Classification: 1.4 G UN 0303**

**STATUS**

In service

# 40mm RFL GREN PFL

## M259A1



### MISSION

The Parachute Flare rifle grenade is designed for use with 5.56 and 7.62 calibre assault rifles, to provide high intensity illumination..

### DESCRIPTION

The 40mm Parachute Flare rifle grenade consists of a parachute and canister assembly, mounted on Mecar's patented and well-proven bullet trap fitted in the tail assembly allows the grenade to be fired by any standard military (5.56mm and 7.62mm) rifle with a 22mm diameter muzzle. When fired, the delay charge

is initiated, and after 4 seconds, the parachute and canister are deployed, providing 75000 candelas of illumination for over 30 seconds. Typically, the grenade is fired at an elevation of 80°, which allows the canister and parachute to deploy at a height of approx. 100 meters.

### TECHNICAL DATA

Type	Illuminating
Calibre	40mm
Round mass (nominal)	460g
Round length	360mm
Illuminating compound	70g
Ignition	4s delay
Aiming grid	Provided with grenade for specific rifle
Bullet trap	Universal for all types of 5.56 & 7.62 ammunition

### PERFORMANCE

Range	35 to 150m* - 50 to 200m**
Burst height	70 to 130m* - 120 to 200m**
Descent rate	1.5m/s
Illuminating rate - period	30s
Illuminating rate - intensity	75000cd
Operational temperature	-32°C to +52°C

\*nominal 5.56mm. \*\*nominal 7.62mm.

### PACKAGING

Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet.

Gross weight (wooden box)	22kg
Dimension ext (wooden box)	485 x 345 x 365mm
Gross weight (complete pallet)	290kg
Dimension ext (complete pallet)	1035 x 1000 x 875mm
UN Classification: 1.3 G UN 0254	

### STATUS

In service

# 40mm RFL GREN CS

**M294A1**

**MISSION**

A shoulder fired Mecar Bullet Trap Universal (BTU) rifle grenade, used to dispense tear and irritant gas (CS), to aid in crowd control during periods of civil disobedience and/or unrest..

**DESCRIPTION**

The grenade comprises a cylindrical aluminium body containing 4 CS pellets, a pyrotechnic delay, a Black Powder expelling charge and an aluminium tail tube assembly with the Mecar Bullet Trap Universal (BTU) in its forward end and polymer tail fins at the rear. The grenade

is launched, using ball or ballistite cartridges, from 5.56 or 7.62mm assault rifles having a 22mm muzzle diameter. The delay element is initiated at launch and, after 2 seconds, ignites the Black Powder charge to both ignite and expel CS gas producing pellets. Burning at a high temperature, the dispersed pellets produce tear and irritant gas for approximately 30 seconds. Grenades may be adapted to other special purpose rifles.

**TECHNICAL DATA**

Calibre	40mm
Round mass (nominal)	440g
Round length	360mm
CS filling	4x 30g pellets
Ignition	2s delay
Aiming grid	Provided with grenade for specific rifle
Bullet trap	Universal for all types of 5.56 & 7.62 ammunition

**PERFORMANCE**

Effective range	75 to 175m* - 125 to 250m**
Ejection time	2s
Duration of gas emissions	30s
Operational temperature	-32°C to +52°C

\*nominal 5.56mm. \*\*nominal 7.62mm.

**PACKAGING**

Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet.

Gross weight (wooden box)	21kg
Dimension ext (wooden box)	485 x 345 x 365mm
Gross weight (complete pallet)	320kg
Dimension ext (complete pallet)	1035 x 1000 x 870mm
UN Classification: 1.4 G UN 0301	

**STATUS**

In service

# 40 mm RFL GREN PIR

## M253A1



### MISSION

The Parachute Infrared rifle grenade is designed for use with 5.56 and 7.62 calibre assault rifles, to provide high intensity illumination in the near infrared for use of night vision goggles..

### DESCRIPTION

The 40mm Parachute Infrared rifle grenade consists of a parachute and canister assembly, mounted on MECAR's patented and well-proven bullet trap fitted in the tail assembly allows the grenade to be fired by any standard military (5.56mm and 7.62mm) rifle with a 22mm

diameter muzzle. When fired, the delay charge is initiated, and after 4 seconds, the parachute and canister are deployed, providing 50W.sr-1 of illumination for over 30 seconds. Typically, the grenade is fired at an elevation of 80°, which allows the canister and parachute to deploy at a height of approx. 100 metres. The pyrotechnic composition is REACH compliant

### TECHNICAL DATA

Type	Infrared
Calibre	40mm
Round mass (nominal)	460g
Round length	360mm
Illuminating compound	70g
Ignition	4s delay
Aiming grid	Provided with grenade for specific rifle
Bullet trap	Universal for all types of 5.56 & 7.62 ammunition

### PERFORMANCE

Range	35 to 150m* - 50 to 200m**
Burst height	70 to 130m* - 120 to 200m**
Descent rate	1.5m/s
Illuminated rate	Period: 30s, Intensity: 50w.sr <sup>-1</sup> , Residual light intensity: 750cd maxi
Operational temperature	-32°C to +52°C

\* nominal 5.56mm \*\* nominal 7.62mm

### PACKAGING

Each grenade individually packed in a waterproof polyethylene container. 25 containers in a wooden box. 12 wooden boxes per pallet.

Gross weight (wooden box)	22kg
Dimension ext (wooden box)	485 x 345 x 365mm
Gross weight (complete pallet)	290kg
Dimension ext (complete pallet)	1035 x 1000 x 875mm
UN Classification: 1.3 G UN 0254	

### STATUS

Qualified

# Upgrade for Gren BTU M2xx-FI/FS

**M1076**

**MISSION**

The rifle grenades can be upgraded with different options:

- A firing indicator (FI) which shows if a grenade has been fired or not. This information can be very helpful for bomb disposal units (UXO identification).
- A firing selector (FS) which allows the shooter to perform indirect firing at short distance with higher accuracy. This capacity can be very helpful to reach targets hidden behind a wall or in an adjacent street. These options are integrated in the tail tube.

**DESCRIPTION**

The firing indicator consists of 3 red points spaced 120° around the base of the tail. They are revealed once the grenade is fired. The firing selector consists of a threaded ring which allows direct firing (closed position) and accurate indirect firing (open position). A special aiming grid is needed to allow indirect firing.

**CHARACTERISTICS**

Type	FI	FS
Calibre	For 35mm and 40mm	
Aiming grid	Provided with grenade for specific rifle	

**PERFORMANCE**

Type	FI	FS
Minimum - Maximum range (accurate indirect fire)	no influence on performance	30m* - 100m*

\*nominal 5.56mm

# Hand Grenade FRAG

## M72



### MISSION

The Mecar hand grenade FRAG-C M72 is a controlled effectiveness grenade producing an optimized fragmentation pattern due to the use of a Composition B explosive with a specially designed liner for maximum splintering effect. The grenade is at the same time offensive and defensive. This means that the soldier is safe when he throws the grenade beyond a distance of 25m. The dispersion of the effective splinters is uniform around the point of explosion whatever the orientation of the grenade. The M72A1 is the grenade fuze designed to be used in the HE Fragmentation grenade M72. Due to

the weight and shape of the M72, it is much more convenient for handling than other grenades of this type.

### GRENADE CHARACTERISTICS

Type	Hand grenade - FRAG
Diameter	52mm
Height	85mm
Mass	180g
Explosive Charge (Comp B)	60g
NSN	1330-13-113-7278

### FUZE CHARACTERISTICS

Mass	52g
Net Explosive Quantity	2.5g
Delay	4s

### PERFORMANCE

Number of fragments	+/-900
Lethal radius	9.5m
Security distance	25m
Operational temperature	-32°C to +52°C

### PACKAGING

4 grenades + 4 time fuzes separately in a plastic box. 10 plastic boxes in a wooden case. 24 wooden cases per pallet

**UN Classification: 1.1 D UN 0284**

### STATUS

In service

# Hand Grenade

## NR8A2



### MISSION

The hand grenade NR8 is designed for offensive and defensive roles.

### DESCRIPTION

The Mecar hand grenade NR8 is a controlled effectiveness grenade producing an optimized fragmentation pattern due to the use of a Composition B explosive with a specially designed liner for maximum splintering effect. For defensive roles, the grenade is used with the spiral notched steel fragmentation sleeve. For offensive roles, the sleeve can be removed.

The grenade fuze NR2433A1 has a constant delay.

### GRENADE CHARACTERISTICS

Type	Hand grenade - FRAG
Diameter	50mm
Height	112mm
Mass	446g
Explosive Charge (Comp B)	98g

### FUZE CHARACTERISTICS

Mass	55g
Net Explosive Quantity	2.3g
Delay	4s

### PERFORMANCE

Mass of fragment sleeve	+/-300g
Lethal radius	12m
Security distance	45m
Operational temperature	-32°C to +52°C

### PACKAGING

4 grenades + 4 time fuzes separately in a plastic box. 10 plastic boxes in a wooden case. 24 wooden cases per pallet

**UN Classification: 1.1 D UN 0284**

### STATUS

In service

# Hand Grenade PRAC

## NR8A2 PRAC



### MISSION

The hand grenade NR8A2 (PRAC) is used for training, specifically the care, handling and throwing of fragmentation hand grenades NR8A2.

### DESCRIPTION

The Mecar hand grenade NR8A2 (PRAC) is composed of an aluminium case and a fragmentation sleeve. This fragmentation sleeve is a steel wire of square section, which is pre-notched, spirally wound and removable. The PRAC Grenade must be used with the fuze PRAC NR2178A1.

### GRENADE CHARACTERISTICS

Type	Hand grenade - PRAC
Diameter	50mm
Height	112mm
Mass	446g

### FUZE CHARACTERISTICS

Mass	55g
Security distance	10m
Operational temperature	-32°C to +52°C

### PACKAGING

4 grenades + 4 time fuzes separately in a plastic box. 10 plastic boxes in a wooden case. 24 wooden cases per pallet

**UN Classification: 1.1 D UN 0284**

### STATUS

In service



# Naval Ammunition



# 127mm L54 HE



## MISSION

The 127mm HE projectile is designed and manufactured by Simmel Difesa to be fired by the OTO Melara automatic gun or US 127mm L54 and the OTO Melara 127mm L64 Lightweight gun.

This projectile may be fired either with full or reduced charge. This type of ammunition can be equipped with PD or Proximity fuzes in order to guarantee the best response to the Navy requirements in every situations.

## DESCRIPTION

The projectile consists of a steel shell filled with high explosive and fitted with a proximity fuze or a point-detonating fuze. This 127mm projectile is in accordance with NATO design and safety standards.

## TECHNICAL DATA

Type	HE
Calibre	127mm
Projectile mass	32kg
Projectile length	661mm
Projectile filling (Comp. B)	3.7kg
Fuze *	VTPA FBO 127 (Proximity fuze) or PD (Point detonating fuze)

\* The projectile can be supplied without fuze

## PERFORMANCE

Muzzle velocity at 32°C	808m/s
Maximum range	20,750m
Operational temperature	-31°C to +55°C

## PACKAGING

24 projectiles per pallet/crate
<b>UN Classification: 1.1 D UN 0168</b>

## STATUS

In service

# 127mm L54 PFFC



## MISSION

The 127mm PFFC projectile is designed and manufactured by Simmel Difesa to be fired by the 127mm L54 OTO Melara automatic gun or 127mm L54 U.S. gun and the OTO Melara 127mm L64 Lightweight gun.

The 127mm PFFC is the latest addition to the 127mm L54 family. This projectile has the same external ballistics of the HE projectile, but it is fitted with about 2,270 tungsten cubes, lined to the steel shell, that enhances its effectiveness, especially for shore bombardment mission. For naval gunfire support, the availability of a Height-Of-Burst (HOB) fuze makes the PFFC

extremely effective when a large area is to be cleared. In this case, a detonation at a few meters above the ground ensures the distribution of fragments over a large area.

## DESCRIPTION

The projectile shell is fitted with tungsten cubes. The projectile consists of a steel shell filled with high explosive and fitted with a proximity fuze.

## TECHNICAL DATA

Type	PFFC
Calibre	127mm
Projectile mass	32kg
Projectile length	661mm
Projectile filling (Comp. B)	4.1kg
Fuze *	VTPA FBO 127 (Proximity fuze)
Fragments	Tungsten

\* The projectile can be supplied without fuze

## PERFORMANCE

Muzzle velocity at 32°C	808m/s
Maximum range	20,750m
Operational temperature	-31°C to +55°C

## PACKAGING

24 projectiles per pallet/crate

UN Classification: 1.1 D UN 0168

## STATUS

In service

# 127mm L54 TP



## MISSION

The 127mm TP projectile is designed and manufactured by Simmel Difesa to be fired by the 127mm L54 OTO Melara automatic gun or 127mm L54 U.S. guns and the OTO Melara 127mm L64 Lightweight gun.

The TP projectile with dummy fuze is equivalent to HE projectile but is used for training only. This projectile has the same ballistics, weight and dimensional characteristics as the HE, but it is filled with inert substance.

## DESCRIPTION

The projectile consists of a steel shell filled with an inert compound and fitted with a dummy fuze.

## TECHNICAL DATA

Type	TP
Calibre	127mm
Projectile mass	32kg
Projectile length	661mm
Projectile filling	3.7 kg of Inert Mixture
Fuze *	Dummy fuze

\* The projectile can be supplied without fuze

## PERFORMANCE

Muzzle velocity at 32°C	808m/s
Maximum range	20,750m
Operational temperature	All climatic zones

## PACKAGING

24 projectiles per pallet/crate

**UN Classification: Not Applicable**

## STATUS

In service

# 127mm L54 FNF



## MISSION

The 127mm FNF projectile is designed and manufactured by Simmel Difesa to be fired by the 127mm L54 OTO Melara automatic gun or 127mm L54 U.S. gun and the OTO Melara 127mm L64 Lightweight gun.

It completes the family of 127mm projectiles. The FNF ammunition has the same internal and external ballistics of the HE projectiles and is used for fuzes testing and for training.

## DESCRIPTION

The projectile consists of a steel shell filled with an inert substance and contains a flash charge.

This flash charge consisting in a mixture of flash composition and black powder provides a flash and sound indication in case of fuze functioning.

## TECHNICAL DATA

Type	FNF
Calibre	127mm
Projectile mass	29.63kg
Projectile length	661mm
Projectile filling (Inert Mixture)	4.1kg
Flash charge	0.085kg

## PERFORMANCE

Muzzle velocity at 32°C	808m/s
Maximum range	20,750m
Operational temperature	-31°C to +55°C

## PACKAGING

24 projectiles per pallet/crate

**UN Classification: 1.3 C UN 0488**

\* The projectile can be supplied without fuze

## STATUS

In service

# 127mm Propelling Charge Full Charge



## MISSION

The 127mm Full Propelling Charge is designed and manufactured by Simmel Difesa to be fired by the 127mm L54 OTO Melara automatic gun or 127mm L54 U.S. guns and the OTO Melara 127mm L64 Lightweight gun.

## DESCRIPTION

The Full charge are separated from the projectiles and are separately packaged in a metal container. The Full Charge is fired with

several types of 127mm standard projectiles such as HE, PFF, TP and FNF.

## TECHNICAL DATA

Type	Full Charge
Calibre	127mm
Charge mass	15.8kg
charge length	889mm
Charge filling	8.2kg
Primer	Electric

## PERFORMANCE

Operational temperature	-31°C to +55°C
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## PACKAGING

1 Charge per metal container. 36 metal containers per pallet
<b>UN Classification : 1.2C - UN 0488</b>

## STATUS

In service

# 127mm Propelling Charge Reduced and Clearing



## MISSION

The 127mm Reduced and Clearing Propelling Charge is designed and manufactured by Simmel Difesa in order to be fired by the 127mm L54 OTO Melara automatic gun or 127mm L54 U.S. guns and the OTO Melara 127mm L64 Lightweight gun.

## DESCRIPTION

The Reduced Charge is used during target practice firings to reduce the firing range and the gun wear.

The Clearing Charge is designed and manufactured to be used to clear the gun tube in the event of a projectile stuck inside it.

## TECHNICAL DATA

Type	Reduced Charge	Clearing Charge
Calibre	127mm	127mm
Charge mass	13.0kg	9.0kg
charge length	889mm	559mm
Charge filling SB (SPDF)	4.0kg	2.9kg
Primer	Electric	

## PERFORMANCE

Operational temperature	-31°C to +55°C
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## PACKAGING

1 Charge per metal container. 36 metal containers per pallet
<b>UN Classification : 1.2C - UN 0488</b>

## STATUS

In service

# FB340



## MISSION

The FB340 fuze is a mechanical fuze designed to be used with 127mm L54 ammunition with PD and PD Delay functions.

## DESCRIPTION

The FB340 fuze was designed in accordance with STANAG 4187.

A graze plunger assembly is assembled in the fuze to ensure the graze functioning.

The fuze is waterproof.

## TECHNICAL DATA

Type	Mechanical fuze
Calibre	127mm L54
Fuze mass (nominal)	2,12kg
Fuze length (nominal)	119mm (overall 248mm)
Booster charge mass (nominal)	118g of A5
Power supply	Firing forces

## PERFORMANCE

Functions	PD super quick and PD super quick graze
Mechanical safety distance	100m
Minimum operating distance	350m
Operating temperature	-40°C +60°C

## PACKAGING

15 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# VTPA FBO127



## MISSION

The VTPA FBO127 is a proximity fuze designed to be used with for 127mm L54 HE and PFF ammunition. It was designed to defeat aircraft, missiles and small boats.

## DESCRIPTION

The VTPA FBO127 is a self-powered radio transmitting and receiving unit. The VTPA FBO127 proximity fuze was designed in accordance with STANAG 4187 and developed and tested in accordance with the criteria of MIL-STD-331. Two operating modes are selectable electrically at the time of firing:

- Proximity + Point detonating + Self-destruction. The fuze is set to initiate detonation when proximity with the target is detected. Point detonating function is provided as backup, in event of direct hit. Self-destruction is activated if neither of the above conditions occurs
- Point detonating only. This mode can be selected for hard targets engagement such as large patrol boats, ships and protected on-shore targets. In this mode proximity and self-destruction are inhibited, and only impact can activate detonation

## TECHNICAL DATA

Type	Electronic fuze
Calibre	127mm L 54
Fuze mass (nominal)	2,12kg
Fuze length (nominal)	120mm (overall 248mm)
Booster charge mass (nominal)	118g of A5
Power supply	Lithium Battery

## PERFORMANCE

Functions	Proximity, Self-destruction, Point detonating
Mechanical safety distance	100m
Minimum operating distance	300m
Electrical safety distance	300m min - 600m max
Setback acceleration	18,000g → (176,580 m/s <sup>2</sup> )
Rotating spin	18,000rpm → (1,885 rad/s)
Self-destruction time (nominal)	35s
Miss distance	10m
Operating temperature	-21°C to +50°C

## PACKAGING

20 fuzes per wooden container  
 24 wooden containers per pallet  
**UN Classification: 1.2D UN 0409**

## STATUS

In service

# 100mm HE F1

## 100mm AMMUNITION FOR NAVAL GUNS



### MISSION

The HE F1 multipurpose high-explosive round is used for surface warfare and shore bombardment. This round can be used with the automatic guns of the Model 53 mounts and derivatives as well as with that of the 100mm COMPACT Mk 2 mounts.

### DESCRIPTION

The 100 mm HE F1 cartridge is delivered and stored, without fuze (the fuze is a separate supply) in an individual aluminium water proof container and consists of :

- A high explosive shell filled with TNT
- A Mod 1953 100mm steel case
- A Mod 1961 (60g) tube ignition system (TIS)
- A Mod 1992 11mm percussion primer
- A single base propelling charge
- A shell sealing plug referred to as storage plug

### TECHNICAL DATA

Type	Multi-purpose high-explosive
Calibre	100mm
Weight of shell	13.5kg with fuze
Weight of cartridge	23.450kg without fuze
Length of shell	450mm with fuze
Length of cartridge	1,085mm with fuze
Cartridge	~4,5 kg of single base propellant
Fuzes	Dual mode fuze or proximity fuze
Loading	1 .050kg of TNT

### PERFORMANCE

Maximum range surface targets	17.400m
Muzzle velocity (new barrel)	867m/s
Standard deviation angle (mrad)	0.3up to 5,000m
Terminal effectiveness	Blast and splinters

### PACKAGING

Light alloy, watertight and fireproof individual containers

### STATUS

In service

# 100mm HE PFF F4

## 100mm AMMUNITION FOR NAVAL GUNS



### MISSION

The HE PFF F4 round is optimised for air defence, including against sea-skimmer anti-ship missiles. This round can be used with the automatic guns of the Model 53 mounts and derivatives as well as with that of the 100mm COMPACT Mk 2 mounts

### DESCRIPTION

The 100 mm Pre Formed Fragment cartridge is delivered and stored without fuze (the fuze is a separate supply) in an individual aluminium waterproof container and consists of :

- A 100 HE PFF F4 shell
- A Mod 1953 100mm steel case
- A Mod 1961 (60g) tube ignition system (TIS)
- A Mod 1992 11 mm percussion primer
- A single base propelling charge
- A shell sealing plug referred to as storage plug

### TECHNICAL DATA

Type	Prefragmented shell cartridge
Calibre	100mm
Round length	1.085mm with fuze
Length of shell	450mm with fuze
Round mass	23.5kg without fuze
Projectile mass	13.5 kg
Weight of propellant	~4.500kg
Fuze	proximity fuze
Warhead/payload	Prefragmented shell body 1.2kg of TNT

### PERFORMANCE

Maximum range surface targets	17,400m
Muzzle velocity	867m/s (new barrel)
Maximum range air targets	6,000m
Standard deviation angle (mrad)	0.3up to 5,000m
Terminal effectiveness	Perforates 10mm steel or 21mm light alloy at 35m

### PACKAGING

Light alloy, watertight and fireproof individual containers

### STATUS

In service

# 100mm TP

## 100mm AMMUNITION FOR NAVAL GUNS



### MISSION

The ammunition range includes the practice shell known as 100mm TP for firing training. This round can be used with the automatic guns of the Model 53 mounts and derivatives as well as with that of the 100mm COMPACT Mk II mounts.

### DESCRIPTION

The ballasted 100mm practice shell cartridge is a practice ammunition with a dummy fuze designed to be used in the mod 1953 100mm or L55 100mm gun.

The ballasted 100mm practice shell cartridge consists of:

- A 100 TP practice shell
- A dummy fuze
- A Mod 1953 100mm steel case
- A Mod 1961 (60g) tube ignition system (TIS)
- A Mod 1992 11mm percussion primer
- A single base propellant

### TECHNICAL DATA

Type	Practice
Calibre	100mm
Round length	1.085mm with fuze
Round mass	23.5kg without fuze
Projectile mass	13.5 kg
Fuze	Dummy fuze
Warhead/payload	Ballast
Weight of propellant	~4,500 kg

### PERFORMANCE

Maximum range surface targets	17,400m
Muzzle velocity	867m/s (new barrel)
Terminal effectiveness	Display of shell operation. Training Warning shot

### PACKAGING

Light alloy, watertight and fireproof individual containers

### STATUS

In service

# 100mm TP-PB-BP

## 100mm AMMUNITION FOR NAVAL GUNS



### MISSION

The ammunition range includes the practice shell known as 100mm TP-PB-BP (Partially Ballasted - Black Powder) for firing training with bursting observations. This round can be used with the automatic guns of the Model 53 mounts and derivatives as well as with that of the 100mm COMPACT MK II mounts.

### DESCRIPTION

The partially ballasted 100mm practice shell cartridge charged with black powder is a testing and practice ammunition.

The 100mm TP-PB-BP is primed by:

- A FU.DE.100.F5 dual effect fuze or
- A proximity fuze (Mod F4.CA.100)

The fuze is a separate supply

The partially ballasted 100mm practice shell cartridge is delivered and stored without fuze (the fuze is a separate supply) in an individual aluminium waterproof container and consists of:

- A 100mm TP-PB-BP practice shell
- A Mod 1953 100mm steel case
- A Mod 1961 (60g) tube ignition system (TIS)
- A Mod 1992 11mm percussion primer
- A single base propelling charge
- A shell sealing plug referred to as storage plug

### TECHNICAL DATA

Type	Practice
Calibre	100mm
Round length	1,085mm with fuze
Round mass	23,5kg without fuze
Projectile mass	13,5kg
Weight of propellant	~4.500kg (LB 7T-70)
Fuze	Dual mode fuze or proximity fuze
Warhead/payload	Ballast with 0,3 kg of black powder

### PERFORMANCE

Maximum range surface targets	17,400m
Muzzle velocity	867m/s (new barrel)
Terminal effectiveness	Display of shell operation. Training Warning shot

### PACKAGING

Light alloy, watertight and fireproof individual containers - 25 per metal crate-pallet

### STATUS

In service

# 76mm L62 HE-PD



## MISSION

The 76mm L62 HE-PD round is designed and manufactured by Simmel Difesa to be fired by all OTO Melara gun systems and equivalent. It is filled with HE (High Explosive) and fitted with a PD (Point Detonating) fuze.

The High-Explosive charge is initiated by the fuze functioning at the impact against the target. This cartridge is used against low flying aircrafts and ground targets.

## DESCRIPTION

The projectile consists of a steel shell filled with High Explosive and a point-detonating fuze. The fuze has two independent mechanical safeties.

The projectile is assembled on a brass cartridge case which is filled with a multi-perforated single base propellant and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE
Calibre	76mm
Round mass (nominal)	12.5kg
Round length	907mm
Projectile mass (nominal)	6.3kg
Projectile filling (Comp. A3)	0.56kg
Fuze	PD
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Muzzle velocity at 21°C	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	-33°C to +63°C

## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.1 E UN 0006**

## STATUS

In service

# 76mm L62 HE-PROX



## MISSION

The 76mm L62 HE-PROX round is designed and manufactured by Simmel Difesa to be fired by all versions of 76mm OTO Melara gun systems and equivalent. It is filled with HE (High Explosive) and fitted with a proximity fuze that can be also provided with self - destruction capability.

This round is used against patrol boats at short range, large ships and protected on-shore targets at long range.

## DESCRIPTION

The projectile consists of a steel shell filled with high explosive and a proximity fuze. The projectile is assembled on a brass cartridge case which is filled with a multi-perforated single base propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE
Calibre	76mm
Round mass	12.5kg
Round length	907mm
Projectile mass	6.3kg
Projectile filling (Comp. A3)	0.56kg
Fuze	VTPA FBO 76 (proximity)
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Muzzle velocity at 21°C	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	-33°C to +63°C

## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.1 E UN 0006**

## STATUS

In service

# 76mm L62 HE-PFF IM84.I



## MISSION

The 76mm L62 HE-PFF IM84.I ammunition is designed and manufactured by Simmel Difesa to be fired by all version of 76mm Oto Melara gun systems and equivalent.

This ammunition was developed to increase the safety during storage and transport due to its high IM characteristics i.a.w. STANAG.4439, and to optimize the effectiveness in anti-missile role as well as against aircraft threats.

## DESCRIPTION

The HE-PFF IM84.I round is the latest version of the Pre-Fragmented Ammunition filled with insensitive explosive SIL ECF-1 (Simmel Difesa composition). The HE-PFF IM84.I body incorporates preformed fragments to maximize the round effectiveness to engage aerial targets (missiles and aircrafts) as well as fast jet boats. The lethal beam consists of pre-formed fragments made of high quality tungsten cubes and steel fragments coming from the shell. The pre-formed fragments assure high levels of penetrations. The round is fitted with the VTPA IM76 proximity fuze. It can ignite the HE charge by target impact or proximity function. The projectile is assembled on a brass cartridge case filled with a multi-perforated single base propellant and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE-PFF
Calibre	76mm
Round mass (nominal)	12.5kg
Round length	907mm
Projectile mass (nominal)	6.3kg
Projectile filling (SIL ECF-1)	0.79kg
Fuze	Proximity VTPA IM76
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	905 m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	From -33°C to +63°C

## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.2 E UN 0321**

## STATUS

Qualified

# 76mm L62 HE-PF-IM6-OES



## MISSION

The 76mm L62 HE-PF-IM6-OES ammunition is designed by Simmel Difesa and OTO Melara to increase the safety during storage and transport by its IM characteristics. It can be fired by the 76L62 OTO Melara compact gun in anti-missile role as well as against aircraft threats.

## DESCRIPTION

The HE-PF-IM6-OES round is the latest version of the Pre-Fragmented Ammunition filled with insensitive explosive.

The HE-PF-IM6-OES body incorporates preformed fragments to maximize the round

effectiveness to engage aerial targets (missiles and aircrafts) as well as fast jet boats. The lethal beam consists of pre-formed fragments made of high quality tungsten cubes and steel fragments coming from the shell. The pre-formed fragments assure high levels of penetrations. The round is fitted with the 3AP microwave fuze. It can ignite the HE charge by target impact or proximity function.

The projectile is assembled on a brass cartridge case filled with a multi-perforated single base propellant and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE-PFF
Calibre	76mm
Round mass (nominal)	12.5kg
Round length	907mm
Projectile mass (nominal)	6.3kg
Projectile filling (B2263A)	0.73kg
Fuze	3AP
Fragments	Tungsten cubes
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	-33°C to +63°C

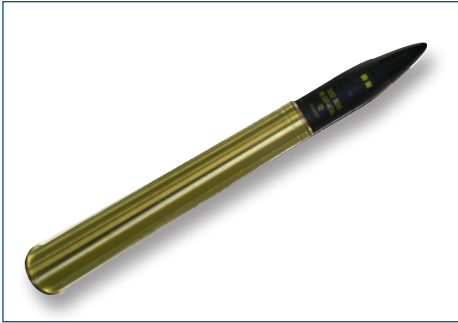
## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements
UN Classification: 1.1 E UN 0006

## STATUS

In service

# 76mm L62 HE SAP IM345



## MISSION

The 76mm L62 HE SAP IM345 round is designed and manufactured by Simmel Difesa to be fired by all versions of 76mm OTO Melara gun systems and equivalent.

It is a High Explosive Incendiary Semi Armour Piercing ammunition fitted with a Base Detonating Electronic Delayed fuze.

This ammunition was developed to optimize the effectiveness of the 76/62 systems in the anti-surface target role and against thick hull-plates of ships.

## DESCRIPTION

The projectile consists of an armour piercing high quality steel shell in order to assure high perforation capability. This projectile is fitted with a special anti-ricochet element, which guarantees an improved engagement capability against target with flat-enough angle of impact. The presence of the aluminium in the high explosive composition assures an enhanced incendiary and blast effect.

The projectile is assembled on a brass cartridge case, which is filled with a multi-perforated single base propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed HE Semi-Armour Piercing round
Calibre	76mm
Round mass (nominal)	12.5kg
Round length (nominal)	907mm
Projectile mass (nominal)	6.3kg
Projectile filling (HEXAL)	0.53kg
Fuze	Base Detonating with Delay (i.a.w Client's requirements)
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	From -33°C to +63°C

## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.1 E UN 0006**

## STATUS

Qualified

# 76mm L62 TP and TP-T



## MISSION

The 76mm L62 TP with Dummy fuze is equivalent to the HE round but is used for training only. This round has the same ballistic, weight and dimensional characteristics as the HE, but it is filled with inert substance. This ammunition is used for training practice. This practice ammunition can be supplied also with the tracer element which burns for at least five seconds after firing. In this case the projectile will be defined as TP-T model.

## DESCRIPTION

The projectile, filled with an inert material, is assembled on a brass cartridge case which is filled with a multi-perforated single base propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round TP	Fixed round TP-T
Calibre	76mm	
Round mass	12.5kg	
Round length	907mm	
Projectile mass	6.3kg	
Projectile filling	Inert mixture	
Fuze	Dummy	
Tracer	Absent	Red effect (5 sec)
Cartridge case	Brass	
Primer	Percussion	
Propellant SB (nominal)	2.35kg	

## PERFORMANCE

Muzzle velocity at 21°C	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	-33°C to +63°C

## PACKAGING

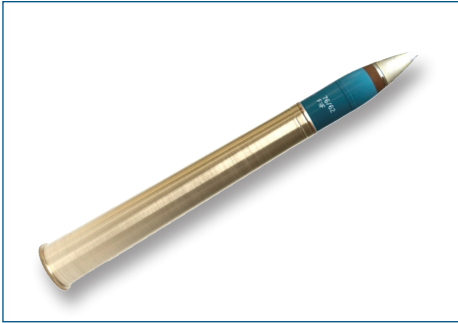
2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.2 C UN 0328**

## STATUS

In service

# 76mm L62 FNF



## MISSION

The 76/62 FNF round is designed and manufactured by Simmel Difesa to be fired by all OTO Melara gun systems and equivalent. The 76mm L62 FNF has the same internal and external ballistics behaviour of the HE ammunition and it is used for fuze testing and training.

## DESCRIPTION

The projectile consists of a steel shell filled with an inert compound and contains a flash charge. This flash charge consisting in a mixture of flash composition and black powder provides

a flash and sound indication in case of fuze functioning. The projectile is assembled on a brass cartridge case which is filled with a multi-perforated single base propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round FNF
Calibre	76mm
Round mass (nominal)	12.5kg
Round length	907mm
Projectile mass (nominal)	603kg
Projectile filling inert (nominal)	0,085kg
Fuze *	Without
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

\* The round can be supplied with fuze

## PERFORMANCE

Muzzle velocity at 21°C	905m/s
Dispersion	External ballistic i.a.w. OTO Melara range table
Maximum range	15,900m
Operational temperature	-33°C to +63°C

## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.3G UN 0191**

## STATUS

In service

# 76mm L62 Clearing Charge



## MISSION

The 76mm L62 Clearing Charge is compatible with all configuration of 76/62 OTO Melara weapon systems. The Clearing Charge is designed and manufactured to be used to clear the gun tube in the event of a projectile stuck inside it.

## DESCRIPTION

The Clearing Charge consists in a brass cartridge case which is filled with a multi-perforated single base propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Clearing Charge
Calibre	76mm
Charge mass (nominal)	6.35kg
Charge length	608mm
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	2.35kg

## PERFORMANCE

Operational temperature	-33°C to +63°C
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## PACKAGING

2 complete rounds in a plastic shock absorber container in a wooden box or i.a.w Client's requirements

**UN Classification: 1.2 C UN 0414**

## STATUS

In service

# 3AP Mod 2 Microwave fuze



## MISSION

The 3AP Mod 2 fuze was designed to increase the capability of target interception to defeat aircrafts, missiles and small boats by an advanced RF sensor and by different settable proximity modes. The delayed impact mode allows the fuze to penetrate boat or bunker.

## DESCRIPTION

The 3AP Mod 2 fuze is an electronic multifunction fuze designed to be used with 76mm L62 ammunition. It can perform in different modes: proximity, time, air burst, point detonation, point detonation delayed and

self-destruction. The fuze is fully programmable using a gun-mounted electronic setter, and can be set automatically at firing or manually. The fuze is fully compliant with STANAG 4187.

The point detonation delayed function activates the fuze 3msec after the impact.

The fuze has been qualified in accordance with STANAG 4157, and its profile is compliant with STANAG 2916 pag B-11.

## TECHNICAL DATA

Type	Electronic multifunction fuze
Calibre	76mm L62
Fuze mass (nominal)	930g
Fuze length (nominal)	95mm (overall 203mm)
Booster charge mass (nominal)	15g of A5
Power supply	Lithium Battery

## PERFORMANCE

Functions	Proximity, PD, PD Delay, Time, SD
Mechanical safety distance	100m
Minimum operating distance	300m
Electrical safety distance for proximity	500m max
Setback acceleration	24,000g → (235,440m/s <sup>2</sup> )
Rotating spin	24,000rpm → (2.513rad/s)
Self-destruction time (nominal)	23s
Operating temperature	-31°C to +63°C

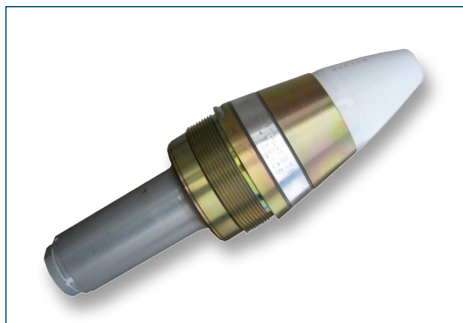
## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# VTPA – FB76



## MISSION

The VTPA FB76 fuze is a proximity fuze to be used with 76mm L62 HE and PFF ammunition. It was designed by Simmel Difesa to defeat aircraft, missiles and small boats.

## DESCRIPTION

The VTPA FB76 fuze is fully compliant with the requirements of STANAG 4187 and was designed, developed and tested in accordance with the criteria of MIL-STD-331. The fuze is a self-powered radio transmitting and receiving unit, operating on the base of the Doppler effect. Two operating modes are selectable electrically at the time of firing:

- Proximity + Point detonating + Self-destruction. The fuze is set to initiate detonation when proximity with the target is detected. Point detonating function is provided as backup, in event of direct hit. Self-destruction is activated if neither of the above conditions occurs.
- Point detonating. This mode can be selected for hard targets engagement such as small patrol boats, ships and land targets. In this mode proximity and self-destruction are inhibited, and only impact can activate detonation. The fuze profile is compliant with STANAG 2916 pag B-11.

## TECHNICAL DATA

Type	Electronic fuze
Calibre	76mm L62
Fuze mass (nominal)	930g
Fuze length (nominal)	95mm (overall 203mm)
Booster charge mass (nominal)	15g of A5
Power supply	Lithium Battery

## PERFORMANCE

Functions	Proximity, Self-destruction, Point detonating
Mechanical safety distance	50m
Minimum operating distance	300m
Electrical safety distance for proximity	500m max
Setback acceleration	24,000g → (235,440 m/s <sup>2</sup> )
Rotating spin	24,000rpm → ( 2,513 rad/s)
Self-destruction time (nominal)	25s
Operating temperature	-21°C to +50°C

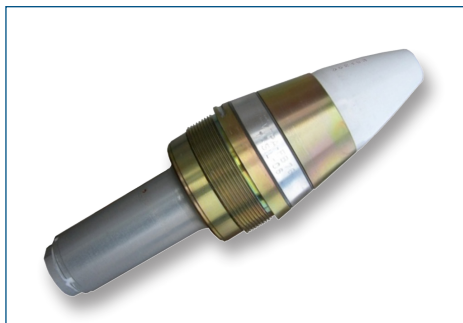
## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# VTP FB76



## MISSION

The VTP FB76 fuze is a proximity fuze to be used with 76mm L62 HE and PFF ammunition. In addition to air defence roles against aircrafts, missiles and small boats, it offers shore bombardment capability.

## DESCRIPTION

The VTP FB 76 fuze is fully compliant with the requirements of STANAG 4187 and it was designed, developed and tested in accordance with the criteria of MIL-STD-331. The fuze profile is compliant with STANAG 2916 pag B-11. The fuze is a self-powered radio transmitting and receiving unit, operating on the base of the

Doppler effect. Two operating modes are selectable electrically at the time of firing:

- Proximity + Point detonating + Self-destruction. The fuze is set to initiate detonation when proximity with the target is detected. Point detonating function is provided as backup, in event of direct hit. Self-destruction is activated if neither of the above conditions occurs.
- Shore bombardment - Point detonating. In this mode the fuze activates detonation at a given height above the ground.

## TECHNICAL DATA

Type	Electronic fuze
Calibre	76mm L62
Fuze mass (nominal)	930g
Fuze length (nominal)	95mm (overall 203mm)
Booster charge mass (nominal)	15g of A5
Power supply	Lithium Battery

## PERFORMANCE

Functions	Proximity, Point detonating, Self-destruction / Shore bombardment
Mechanical safety distance	50m
Minimum operating distance	300m
Electrical safety distance for proximity	500m max
Setback acceleration	24,000g → (235,440m/s <sup>2</sup> )
Rotating spin	24,000rpm → ( 2.513rad/s)
Self-destruction time (nominal)	25s
Operating temperature	-20°C to +50°C

## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# FB 518A



## MISSION

The FB 518A fuze is a mechanical fuze designed to be used with 76mm L62 ammunition. The fuze has two operating modes, Super-Quick Point Detonation and Point Detonation Delayed, settable by means of the switch on the side of the fuze.

## DESCRIPTION

The FB 518A fuze is fully compliant with the requirements of STANAG 4187 and was designed, developed and tested in accordance with the criteria of AOP 20.

The Super-Quick mode can be selected to have

detonation on the target.

The Point Detonation Delayed mode can be selected to ensure a detonation delay of 0.05" after impact (standard - other delays are available on customer request).

## TECHNICAL DATA

Type	Mechanical fuze
Calibre	76mm L62
Fuze mass (nominal)	930g
Fuze length (nominal)	95mm (overall 203mm)
Booster charge mass (nominal)	15g of A5
Power supply	n/a

## PERFORMANCE

Functions	Point detonating and PD Delay
Mechanical safety distance	50m
Minimum operating distance	300m
Setback acceleration	24,000g → (235,440m/s <sup>2</sup> )
Rotating spin	24,000rpm → ( 2.513rad/s)
Operating temperature	-40°C to +50°C

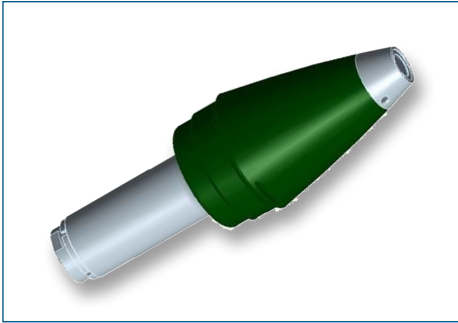
## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# FB 518B



## MISSION

The FB 518B fuze is a mechanical fuze designed to be used on 76mm L62 ammunition. The fuze has Super-quick PD function and it has been designed to be a low cost PD fuze for 76mmL62.

## DESCRIPTION

The FB 518B fuze is fully compliant with the requirements of STANAG 4187 and has been designed, developed and tested in accordance with the criteria of AOP 20.

This is an mechanical fuze with point detonating function in the event of a direct hit.

## TECHNICAL DATA

Type	Mechanical fuze
Calibre	76mm L62
Fuze mass (nominal)	930g
Fuze length (nominal)	95mm (overall 203mm)
Booster charge mass (nominal)	15g of A5
Power supply	Firing force

## PERFORMANCE

Functions	Point detonating and PD Delay
Mechanical safety distance	50m
Minimum operating distance	300m
Setback acceleration	24,000g → (235,440m/s <sup>2</sup> )
Rotating spin	24.000rpm → ( 2.513rad/s)
Operating temperature	-40°C to +50°C

## PACKAGING

20 fuzes per wooden container
24 wooden containers per pallet
<b>UN Classification: 1.2D UN 0409</b>

## STATUS

In service

# 40mm L70 HE-PD



## MISSION

Simmel Difesa has a long and in-depth experience in 40mm L70 ammunition design and production. The 40mm L70 ammunition is used worldwide and qualified in accordance with NATO standards for use with all types of 40mm L70 guns.

The high-explosive bursting charge is detonated by the fuze upon target impact. This cartridge is used against low flying aircrafts and ground targets also.

## DESCRIPTION

The HE-PD round consists of a steel body filled with high explosive and a point-detonating fuze. The fuze has dual mechanical safety. The projectile is mounted on a brass cartridge case which is filled with single base propellant multi-perforated and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE
Calibre	40mm
Round mass (nominal)	2.5kg
Round length	535mm
Projectile mass (nominal)	0.96kg
Projectile filling (nominal)	0,095kg
Fuze	Point Detonating Delay-Self-destruction, Point Detonating Super Quick
Cartridge case	Brass
Primer	Percussion
Propellant SB	0.480kg

## PERFORMANCE

Muzzle velocity at 21°C	1005m/s
Maximum range	11800m
Operational temperature	-40°C to +60°C

## PACKAGING

1 round per container, 20 containers per wooden box or 8 rounds per metal box

UN Classification: 1.1 UN 0006

## STATUS

In service

# 40mm L70 HE-PFF



## MISSION

Simmel Difesa has a long and in-depth experience in 40L70 ammunition design and production. The 40 L70 ammunition is used worldwide and qualified in accordance with NATO standards for use with all types of 40L70 gun systems.

The HE-PFF body incorporates preformed fragments to maximize the round effectiveness for aerial target engagements. The lethal beam consists of pre-formed fragments made of high quality tungsten cubes and steel fragments coming from the shell. The pre-formed fragments assure high levels of penetrations. The round is fitted with a proximity fuze, based on RF Doppler function. It

can initiate the HE charge upon target impact or in close proximity to the target. The HE charge explosion produces the lethal fragmentation and blast.

## DESCRIPTION

The HE-PFF projectile consists of alloy steel shell with tungsten pre-fragmented cubes filled with high explosive and a proximity fuze. The projectile is assembled with brass cartridge case which is filled with a multi-perforated propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE-PFF
Calibre	40mm
Round mass (nominal)	2.5kg
Round length	535mm
Projectile mass (nominal)	0.96kg
Projectile filling (comp B)	0.110kg
Fuze	Proximity
Fragments	Tungsten
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	0.480kg

## PERFORMANCE

Muzzle velocity at 21°C	1,005m/s
Maximum range	11,800m
Operational temperature	-40°C to +60°C

## PACKAGING

1 round per container, 20 containers per wooden box or 8 rounds per metal box

**UN Classification: 1.1 E UN 0006**

## STATUS

In service

# 40mm L70 HE-T and HEI-T



## MISSION

Simmel Difesa has a long and in-depth experience in 40L70 ammunition design and production. The 40 L70 ammunition is used worldwide and qualified in accordance with NATO standards for use with all types of 40L70 gun systems.

The HE (High-Explosive) or the HEI (High-Explosive Incendiary) bursting charge is initiated by the fuze upon target impact. This cartridge is used to defeat low flying aircrafts and ground targets.

## DESCRIPTION

The projectile consists of a steel body filled with high explosive, a point-detonating fuze and a tracer. The fuze has two independent mechanical safety. The projectile is assembled with a brass cartridge case which is filled with a multi-perforated propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round HE-T	Fixed round HEI-T
Calibre	40mm	
Round mass (nominal)	2.5kg	
Round length	535mm	
Projectile mass (nominal)	0.96kg	
Projectile filling (nominal)	0.104kg Comp B	0.104kg Tritolital
Fuze	PDDLJ-SD, PDSQ, PDDLJ	
Tracer	Red effect, 4s (Minimum)	
Cartridge case	Brass	
Primer	Percussion	
Propellant SB (nominal)	0.480kg	

## PERFORMANCE

Muzzle velocity at 21°C	1,005m/s
Maximum range	1,1800m
Operational temperature	-40°C to +60°C

## PACKAGING

1 round per container, 20 containers per wooden box or 8 rounds per metal box

**UN Classification: 1.1 E UN 0006**

## STATUS

In service

# 40mm L70 AP-T



## MISSION

Simmel Difesa has a long and in-depth experience in 40L70 ammunition design and production.

The 40 L70 ammunition is used worldwide and qualified in accordance with NATO standards for use with all types of 40/70 gun systems.

The AP-T ammunition is a kinetic energy ammunition able to penetrate rolled homogeneous armour plates.

## DESCRIPTION

The projectile consists of a hardened steel body penetrator fitted with a special anti-ricochet and a windshield cap to maintain the aerodynamic profile. The projectile is fitted with a tracer. The projectile is assembled with a brass cartridge case which is filled with a multi-perforated propellant and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round AP-T
Calibre	40mm
Round mass (nominal)	2.5kg
Round length	526mm
Projectile mass (nominal)	0.96kg
Projectile filling tracer element	8.4g
Tracer	Red effect, 4s (Minimum)
Cartridge case	Brass
Primer	Percussion
Propellant SB (nominal)	0.480kg

## PERFORMANCE

Muzzle velocity at 21°C (nominal)	1005m/s
Penetration	50mm at 30°
Maximum range	11,800m
Operational temperature	-40°C to +60°C

## PACKAGING

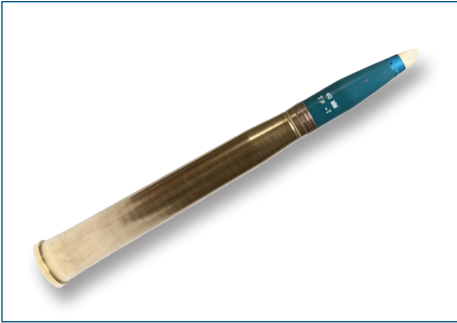
1 round per container, 20 containers per wooden box or 8 rounds per metal box

**UN Classification: 1.2 C UN 0328**

## STATUS

In service

# 40mm L70 TP and TP-T



## MISSION

Simmel Difesa has a long and in-depth experience in 40L70 ammunition design and production.

The 40L70 ammunition is used worldwide and qualified in accordance with NATO standards for use with all types of 40L70 gun systems.

The TP and TP-T are used to provide cost effective and live fire training of gun crews.

## DESCRIPTION

The rounds have the same characteristics of the HE and HE-T. The projectiles, filled with an inert material have the same ballistic of the HE rounds. The TP-T projectile is fitted with a tracer. The projectiles are assembled with a brass cartridge case which is filled with a multi-perforated propellant charge and fitted with a percussion primer.

## TECHNICAL DATA

Type	Fixed round TP	Fixed round TP-T
Calibre	40mm	
Round mass (nominal)	2.5kg	
Round length	535mm	
Projectile mass (nominal)	0.96kg	
Projectile filling	Inert	
Tracer	Absent	Red effect, 4s (Minimum)
Cartridge case	Brass	
Primer	Percussion	
Propellant SB (nominal)	0,480kg	

## PERFORMANCE

Muzzle velocity at 21°C	1,005m/s
Maximum range	11,800m
Operational temperature	-40°C to +60°C

## PACKAGING

1 round per container, 20 containers per wooden box or 8 rounds per metal box

**UN Classification: 1.2 C UN 0328**

## STATUS

In service

# FB40



## MISSION

The FB40 is a proximity fuze for 40mm L70 HE and PFF ammunition. It was designed to defeat aircrafts, missiles and small boat targets. A point detonating function allows to use the fuze against hard target.

## DESCRIPTION

The FB40 fuze was designed in accordance with STANAG 4187 and developed and tested in accordance with the criteria of MIL-STD-331. This fuze ensures optimum performance against all land and naval targets.

Two operating modes are selectable electrically at the time of firing:

- Proximity + Point detonating + Self-destruction. The FB40 fuze is set to initiate detonation when proximity with the target is detected. Point detonating function is provided as backup, in event of direct hit. Self-destruction is activated if neither of the above conditions occurs.
- Point detonating. This functioning mode can be selected for hard targets engagement. In this mode proximity and self-destruction are inhibited, and only impact can activate detonation.

## TECHNICAL DATA

Type	Electronic fuze
Calibre	40mm L70
Fuze mass (nominal)	128g
Fuze length (nominal)	83.2mm (overall 98,1mm)
Booster charge mass (nominal)	1,43g of T4
Power supply	Lead Battery

## PERFORMANCE

Functions	Proximity, Self-destruction, Point detonating
Mechanical safety distance	50m
Minimum operating distance	400m
Electrical safety distance for proximity	500m max
Setback acceleration	40,000g → (392,400m/s <sup>2</sup> )
Rotating spin	40,000rpm → (4.190rad/s)
Self-destruction time (nominal)	9s
Miss distance	3m
Operating temperature	-21°C to +51°C

## PACKAGING

20 fuzes per metallic box. 2 metallic boxes per wooden container

24 wooden containers per pallet

**UN Classification: 1.2D UN 0409**

## STATUS

In service

# SIL M5



## MISSION

The SIL M5 fuze is a PD Delay impact fuze with SD function designed for use with 40mm L70 HE projectiles. With a post impact delay function of a few milliseconds the fuze has the capability to penetrate soft target before detonating. It is a copy of the BPD M5 fuze produced in millions of items with some explosive changed in consequence of obsolescence.

## DESCRIPTION

SIL M5 fuze is a pyrotechnical fuze with PD DLY and Self-destruction functions (after 7s of flight). The delay PD function activates the fuze 1.5ms after the impact. The fuze is waterproof, and fully compliant with the STANAG 4187.

## TECHNICAL DATA

Type	Pyrotechnical fuze
Calibre	40mm L70
Fuze mass (nominal)	62g
Fuze length (nominal)	42mm (overall 74mm)
Booster charge mass (nominal)	1,5g of A5
Power supply	Firing force

## PERFORMANCE

Functions	PD Delay and SD
Mechanical safety distance	50m
Minimum operating distance	300m
Setback acceleration	40,000g max → (392,400m/s <sup>2</sup> )
Rotating spin	40,000rpm max → ( 4.189rad/s)
Operating temperature	-40°C to +60°C

## PACKAGING

20 fuzes per metallic box. 2 metallic box per wooden container

24 wooden containers per pallet

**UN Classification: 1.2D UN 0409**

## STATUS

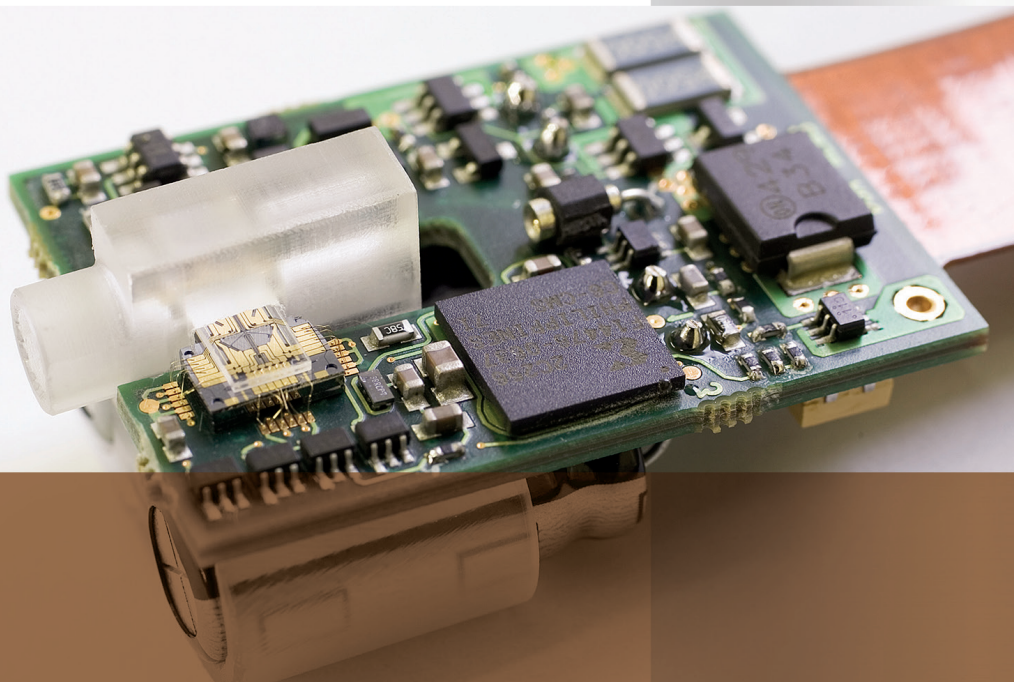
In service

40 M  
PFFC IN  
COMP  
T SIL11G0

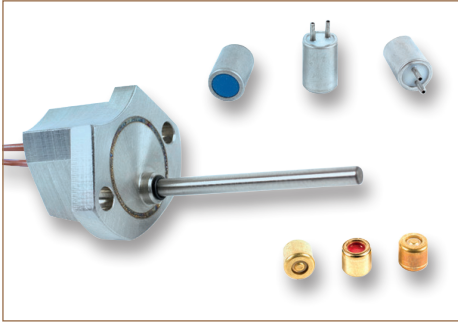
40 M  
PFFC IN  
COMP  
T SIL11G0



# Other Products and Services



# Pyrotechnic Components



## MISSION

Nexter Munitions develops and manufactures pyrotechnic components, subsystems and actuators. Dedicated to ammunition, missiles, aeronautics and space applications, the pyrotechnic components belong to the key elements which must combine high levels of safety and reliability whatever the extreme and various environments they have to deal with.

In addition to the conventional pyrotechnic components, Nexter Munitions is currently developing advanced pyrotechnic technologies such as:

- Micropyrotechnics: Pyro-MEMS®
- Optopyrotechnics (Optopyrotechnic igniters and detonators)
- Low-energy EFI
- “Lead free” components

## TECHNICAL DATA

### FIRING

<b>Electric</b>	From low-energy to EBW
<b>Mechanical</b>	From 10 to 300mJ
<b>Optical</b>	From 10 to 20mJ, laser diode initiation

### DIMENSIONS

From Ø 3.7 to Ø 7mm

### APPLICATIONS

Missiles equipments (thermal battery, actuators, pyrotechnic train...)

Medium and large calibre ammunition

Pyrotechnic ammunition

Aeronautic and space systems

Pyromechanisms

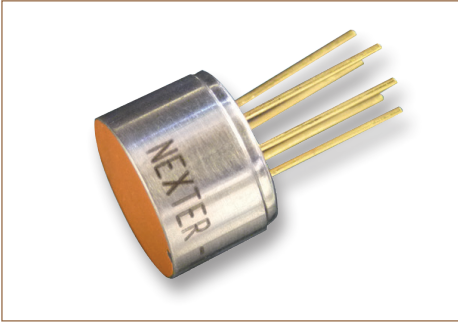
### STATUS

Mass production

# Solid State Low Energy Exploding Foil Initiator (LEEFI)



## FUZING SYSTEMS & IGNITION SAFE DEVICES



### MISSION

LEEFI technology (slapper) is one of the key components of Electronic Safety and Arming fuzes for missile.

The new LEEFI technology, developed by Nexter Munitions, while maintaining the high levels of safety and reliability of the conventional EFI's requires low energy for the ignition.

This component triggers warheads or propulsion systems under optimal conditions and guarantees the safety level of the weapon system during its complete life cycle.

### TECHNICAL DATA

Safer: no primary explosive
Automatic return to a Safe position
Increased insensitivity & reliability in severe environment (no moving parts)
<ul style="list-style-type: none"> <li>• Hard impact</li> <li>• Electromagnetic / Electrostatic environments</li> <li>• Other IM performances</li> </ul>
Greater flexibility of use via electrical interface
Low energy
Lower cost than conventional EFI
Suitable for warhead and propulsion systems
STANAG 4187 ed. 4 and STANAG 4368 ed. 3 compliant

### STATUS

Qualified

# Optopyrotechnic Components

## PYROTECHNIC COMPONENTS



### MISSION

Optopyrotechnic igniters and detonators are initiated by light energy supplied by a laser diode and transmitted by an optical fibre. This advanced technology is particularly suited to extreme environments including severe electromagnetic environments. The optopyrotechnic applications encompass missiles, aeronautics and space domains.

### TECHNICAL DATA

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Insensitive to electromagnetic disturbances and electrostatic discharges

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Reduced dimension

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Temperature range from -120 to +110°C

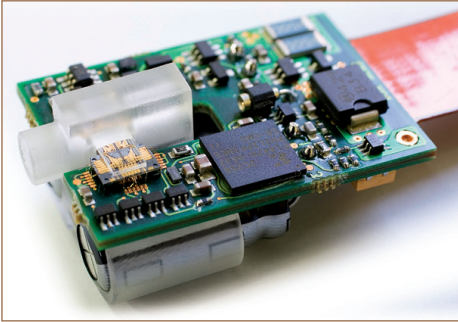
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### STATUS

Under development

# Pyro-MEMS®

## FUZING SYSTEMS



### MISSION

The Safety and Arming Unit (SAU) is one of the key components of any ammunition. This component triggers the warhead under optimal conditions and guarantees the safety level of the ammunition during its complete life cycle. It is also used for the ignition of rockets motors. The Pyro-MEMS® technology developed by Nexter Munitions while enhancing the safety, reliability and functionalities of the SAU's aims at a significant miniaturisation level. This technology intends to replace obsolescent SAU technologies (clock mechanisms...). Thanks to its level of miniaturisation and the expected cost

benefits, the Pyro-MEMS® are compatible with micro generic and multipurpose SAU's which shall cover a large range of applications.

### TECHNICAL DATA

#### MEMS SAU

Mainly dedicated to mass produced ammunition (from medium to large calibres).

#### ESAD MEMS (Electrical Safety and Arming Devices)

Mainly dedicated to advanced warheads (focused terminal effects, scalable and programmable warheads), SAU's and pyromechanisms for applications such as:

- Missiles
- Bombs
- Torpedoes
- Aeronautics and space applications

### STATUS

Under development



On June 2010, the works conducted on the miniaturized SAU for fuzes: Pyro-MEMS® have been granted by the 37<sup>th</sup> Prix Paul Chanson awarded by the Land Armament Association (AAT).

# XF

## MELT/CAST EXPLOSIVE FOR INSENSITIVE AMMUNITION



### MISSION

Nexter Munitions has developed a very low vulnerability melt/cast explosive composition called XF.

Already used in the 155mm LU 211 shell, the XF compositions are perfectly suitable for other applications, like the filling of shells for field artillery, mortar and high-explosive tank shells.

### TECHNICAL DATA

#### XF 13333 explosive composition

Detonation velocity	6,976m/s
Detonation pressure	>210kbar (theoretical value)
Critical diameter	<60mm
Impact sensitivity - ISI NFT 70-500	30% Go at 50 joules
Friction sensitivity - ISF NFT 70-503	0% Go at 353N

#### XF 11585 explosive composition

Detonation velocity	7,468m/s
Detonation pressure	242kbar (theoretical value)
Unconfined critical diameter	~10mm
Impact sensitivity - ISI NFT 70-500	30% Go at 50 joules
Friction sensitivity - ISF NFT 70-503	0% Go at 353N

### STATUS

**XF 13333:** Qualified and in service

**XF 11585:** Qualified

# XP

## PRESSED EXPLOSIVE FOR INSENSITIVE AMMUNITION



### MISSION

Nexter Munitions has developed a very low vulnerability pressed explosive composition called XP.

The XP explosive is a composition compressible at ambient temperature with high detonic performances and low vulnerability, for applications ranging from the filling of medium-calibre shells to warheads including detonating relays.

### TECHNICAL DATA

#### XP explosive composition

Detonation velocity	7,921m/s
Detonation pressure	285kbars (theoretical value)
Critical diameter	between 5 and 10mm
Impact sensitivity - ISI NFT 70-500 STANAG 4489	30% Go at 50J
Friction sensitivity - ISI NFT 70-503 STANAG 4487	0% Go at 353N

### STATUS

Qualified

# Propellants



## PROPELLANTS

Propellants are chemicals used in the production of energy for the propulsion of a projectile. It is burned or otherwise decomposed to produce the propellant gas.

Propellants fill the interior of an ammunition cartridge or the chamber of a gun or cannon, leading to the expulsion of the projectile.

## PROPELLING POWDERS

Grains 1, 7 & 19 holes for calibres 40mm up to 155mm

Composition:

- Single Base
- Double Base
- Triple Base
- Multi Base for Special Application (Modular Charge System)

## SINGLE BASE

Conventional	DNT Free	
M 1 + 1	SIL 1	7 perforations for calibre 40/60
M 1 + 1	SIL 1	19 perforations for calibre 40/70
M 10 + 1	M 10 + 1	1 perforation for calibre 57
M 6 + 2	SIL 6 + 2	7 perforations for calibre 76/62
M 6 + 2	SIL 6 + 2	19 perforations for calibre 76/62
M 10	M 10	19 perforations for calibre 76/62
M 6 + 2	SIL 6 + 2	7 perforations for calibre 76/62
M 1	SIL 1	7 perforations for calibre 105
M 1	SIL 1	1 perforation for calibre 105
M 1	SIL 1	7 perforations for calibre 105 HEP-T
SPDF	SPDF	7 perforations for calibre 127/54
M 1	SIL 1	7 perforations for propelling charge M4A2 for calibre 155

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**Next generation propellants (DBP & DPA free)**

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SIL RTP1 - 19 perforations for calibre 40/70

SIL RTP6 - 7 perforations for calibre 76/62

SIL RTP3 - 7 perforations for calibre 100mm

SIL RTP2 - 7 perforations for calibre 155mm

BOTTOM modular charges

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**DOUBLE TRIPLE & MULTIBASE**

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Double Base M 26 - 7 perforations for calibre 105 DM33

Double Base M 26 - 7 perforations for calibre 105 DM63

Double Base M 26 - 7 perforations for calibre 106

Triple Base M 30 - 7 perforations for calibre 105

Triple Base M 30 - 7 perforations for calibre 120

Triple Base M 30 - 7 perforations for TOP modular charges calibre 155

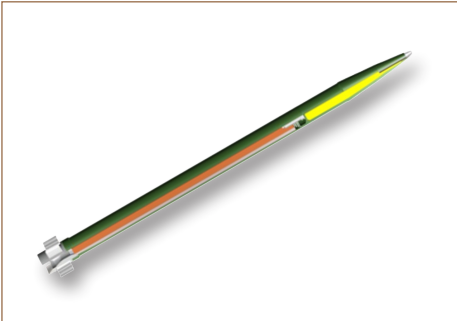
Multi Base BPD 5 - 19 perforations for modular charges calibre 155

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**STATUS**

In service

# 122mm Rocket FIROS 30



## MISSION

The 122mm FIROS 30 field rocket system was developed by Simmel Difesa, using an air-to-ground rocket as the basis to provide ground forces with area-saturation fire support.

The FIROS 30 is a highly effective weapon system designed to be employed in flexible operational organization in accordance with the task requirement on the battle-field:

- High volume of fire
- Short ripple duration
- Use against different types of targets
- Wide operational range
- High saturation compatibility

- Minimum personnel
- Rapidity and accuracy of firing actions

## DESCRIPTION

The FIROS 30 weapon system is based on the employment of a 122mm calibre rocket that can be fitted with various types of warheads (HE, PFF and TP).

## TECHNICAL DATA

Type	Fixed rocket (warhead) HE; PFF; TP
Calibre	122mm
Complete rocket mass (nominal)	65kg
Complete rocket length (nominal)	2,815mm
Warhead rocket mass (nominal)	26kg
Warhead filling	Comp B, Inert (for TP warhead)
Fuze	Proximity, PD or Dummy (for TP warhead)

## PERFORMANCE

Max velocity	1,035m/s
Max range (nominal)	35,000m
Operational temperature	-40°C to +60°C
Storage temperature	-40°C to +60°C
Ripple duration	16s

## PACKAGING

Multiple rocket launcher: 40 tubes in 2 modules

**UN Classification : 1.1 E UN 0181**

## STATUS

In service

# Missile Equipment

## WARHEADS AND SAFETY DEVICES



### MISSION

Nexter Munitions and Simmel are key partners in warhead technologies for the European missile manufacturers. Both combine R&D and industrial know-how and expertise in areas such as warheads, safety and arming units, pyrotechnic devices, highly-effective explosive payloads and insensitive ammunition technologies.

### DESCRIPTION

Applications include missiles (anti-bunker, anti-tank, anti-aircraft, anti-ship, anti-site, ballistic, dispenser), torpedoes, bombs, rockets, countermeasures and space equipment. These components are particularly integrated into:

- Ammunition from medium to large calibres produced by Nexter Ammunition Business Group
- Most of the European programs on tactical missiles (Eryx, Scalp EG-SS, MdCN, Aster, Mistral, Exocet, Mica, Iris, Marte, Aster, Aspide...)
- Strategic missiles (ASMP-A, M51)
- Torpedo, underwater drone warheads (MU 90, K-STER)
- Pyrotechnic actuation and safety devices

The best solutions are offered thanks to the use of the more advanced technologies in terms of:

- Optimization and control of the terminal effectiveness
- Safety level
- Cost/efficiency ratio
- Payload/efficiency ratio
- Compliance with the best international standards

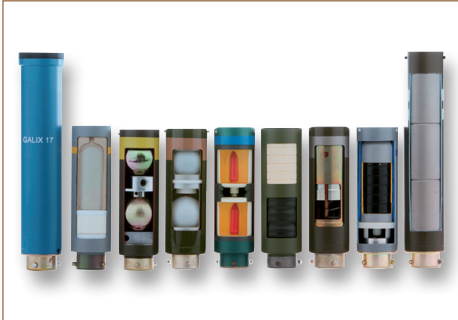
### STATUS

In service

# GALIX



## SELF-DEFENSE SYSTEM FOR ARMoured VEHICLES



### MISSION

The GALIX system treats all known threats, and therefore offers optimum defensive action to enhance the survivability of armoured vehicles:

- If identified by the enemy, by avoiding engagement (broad band IR-visible smoke grenade)
- If engaged by an IR-guided missile, by avoiding being hit (IR decoy ammunition)
- If approached by enemy troops, by preventing an attack (self-defence ammunition)
- If engaged in a peacekeeping operation (crowd dispersal ammunition)

The GALIX system is modular and the nature of the ammunition, the number of launcher tubes and their positioning can therefore be determined as a function of vehicle geometry and mission.

### TECHNICAL DATA

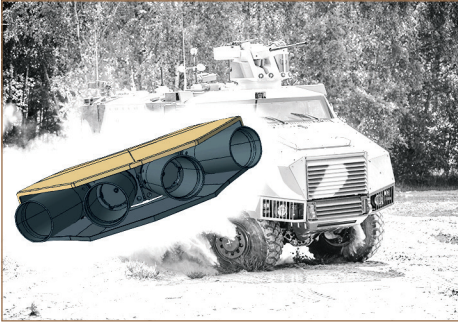
MUNITION	STATUS
GALIX 4 - Self-defence grenade	In service
GALIX 6 - IR decoy	In service
GALIX 13 - Broad band IR-visible smoke grenade	In service
GALIX 15 - PR tear gas grenade (close range)	Under development/qualification
GALIX 16 - P tester	In service
GALIX 17 - Training smoke grenade	In service
GALIX 18 - Training self-defence grenade	Under development/qualification
GALIX 19 - Warning grenade	In service
GALIX 29 - Blast grenade effect	Under development/qualification
GALIX 46 - Crowd dispersal grenade	In service
Launch Tube	In service
Firing control unit	In service

### STATUS

In service

# SYDEX®

## NEW GENERATION OF SELF-DEFENCE SYSTEM FOR ARMoured VEHICLES



### MISSION

Compared to the current softkill systems, SYDEX® offers additional capabilities thanks to an embedded Smart Firing Control System (SFCS). This new generation of softkill system increases the performance and survivability of the armoured vehicles thanks to its improved digital data link with the vehicle aiming at the optimization of the response to any threats to be dealt with. Furthermore, SYDEX® is able to fire a future generation of programmable ammunition, especially fitted for the “less than lethal” purpose.

### TECHNICAL DATA

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Compatibility with current softkill standard ammunition

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Smart Firing Control System (SFCS) optimizing the response to any threat

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Ammunition type and status electronic recognition

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Programmable ammunition setter

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Launch tube and vehicle interconnection by a digital bus

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Compatibility with “less than lethal” ammunition meeting advanced operational use control requirements

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### STATUS

Under development

# BRENUS



## REACTIVE ADDED PROTECTION KIT FOR MBTs AND LIGHT ARMoured VEHICLES



### MISSION

The BRENUS add on ERA enables MBTs and light armoured vehicles protection to be upgraded to the highest level against missiles, anti-tank rockets and top attack grenades. BRENUS provides protection against HE shells, and only weighs one ninth of the equivalent protection in steel.

It is remarkably insensitive to accidental battlefield incidents and attacks.

### TECHNICAL DATA

BRENUS reactive modules provide acceptable protection against shaped charges, equivalent to 400mm of steel armour.

Its modular design facilitates installation on all vehicles, as a function of mission requirements. BRENUS reactive modules have been officially acknowledged as MURAT (low hazard ammunition) by French Ministry of Defense.

BSG2 bricks and U12 boxes provide protection against HE shells, while increasing resistance against attack by medium calibre weapons. BSG3 bricks provide protection against top attack grenades.

Added protection kits have been developed for the AMX-30B2, M48, M60 and T-72 MBTs and for the M113, BMP-3 and CV90 light armoured vehicles.

### STATUS

Qualified

# 40mm EOD Charge

M1157



## USE

For safe and contact free disabling and disposal of visible mines and UXOs. Can also be used for those covered with soil, or underwater.

## DESCRIPTION

The charge consists of a plastic body mounted on a disposal non-ferrous spike. A copper liner with a composition A3 explosive charge is assembled in the body. The charge is initiated, using all types of standard ignition devices, such as flash, electrical or shock tube detonators, (not supplied), via the mounting hole on the

rear of the body. A non-ferrous tripod is available as an option.

## TRAINING

Didactic materials, such as cutaways and inert training models, are available.

## TECHNICAL DATA

Type	EOD Charge
Total weight (without tripod)	105g
Length	105mm
Cone diameter	40mm
Explosive	Composition A3
Explosive mass	80g
Liner	Copper
Body	Plastic

## PACKAGING

8 charges and spikes per plastic box. 10 plastic boxes per plywood box. 2 plywood boxes per pallet.

Non-ferrous tripods are available as an option- alternative packaging available on request - Markings according to NATO standards.

## STATUS

In service

# 80mm EOD Charge

**M1158**



## USE

For safe and contact free disabling and disposal of visible mines and UXOs. Can also be used for those covered with soil, or underwater.

## DESCRIPTION

The charge consists of an aluminium body mounted on a non-ferrous tripod. A copper liner with a composition A3 explosive charge is assembled in the body. The charge is initiated, using all types of standard ignition devices, such as flash, electrical or shock tube detonators (not supplied), via the mounting hole on the rear of

the body. The body has an aiming device which is used to ensure that the charge is correctly aimed at the target.

## TRAINING

Didactic materials, such as cutaways and inert training models, are available.

## TECHNICAL DATA

<b>Type</b>	EOD Charge
<b>Total weight (without tripod)</b>	1.7kg
<b>Length</b>	190mm
<b>Cone diameter</b>	80mm
<b>Explosive</b>	Composition A3
<b>Explosive mass</b>	700g
<b>Liner</b>	Copper
<b>Body</b>	Aluminium

## PACKAGING

2 charges and tripods per plastic box. 10 plastic boxes per plywood box. 2 plywood boxes per pallet.

Non-ferrous tripods are available as an option- alternative packaging available on request - Markings according to NATO standards.

## STATUS

In service

# Demilitarization



The Ammunition Business Group also offers dismantling engineering support compliant with pyrotechnic and environmental regulations, in accordance with the particular nature of the stocks of pyrotechnic components and/or conventional ammunition to be destroyed or recycled. If necessary, these services are provided with technical assistance as well as training.

Simmel Difesa, leader in producing Ammunition and Propellants, with the aim to complete the range of activities made available the Demilitarization Plant located in Anagni, near to Simmel Difesa Ammunition Plant.



The Plant is able to process a huge amount of ammunition and explosives materials, starting from small calibers (9 mm, 5.56 mm, 7.62 mm, 12.7mm) to the biggest (203 mm artillery projectile), as well as hand grenades, air-drop and mortar bombs, land- and underwater mines, complete rockets and missiles, rockets and missiles components, sub-munitions. The Plant is able to dispose the resulting by-products.

## Operations phases

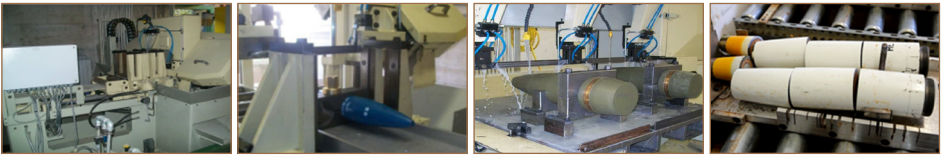
Equipment \ Ammunition	Small Ammo up to 20 mm	Grenades	Mortar Bombs	Rocket Launcher	Pyrotechnic & Generator	Tank from 30 mm to 125 mm	Artillery from 75/24 to 155 mm	Mines all types	White Phosphorus PWP-Smokes Ammunition
Tools, vices, tables, pneumatic handling machine	X	X	X	X	X	X	X	X	X
Disassembly machine				X		X	X		
Defusing machine		X	X	X		X	X	X	
Saws		X	X	X	X	X	X	X	X
Waterjet		X	X	X	X	X	X	X	X
Wash out		X	X	X		X	X	X	
Rotary oven	X	X	X	X	X	X	X	X	X
Tunnel Oven		X	X	X		X	X	X	
Flash oven	X	X	X	X	X	X	X	X	X
Static Oven					X				X
Smoke treatment Facility	X	X	X	X	X	X	X	X	X

# Demilitarization

## Operations phases

- Ammunition Unpacking
- Disassembling and primers Removal and Inertization
- Projectiles, Bombs, Grenades Defusing
- Supplementary Charge Disassembling
- Ammunition Cut by submerged saws
- Ammunition Unloading of large calibres up to 203 mm
- Ammunition Inertization by Rotative Oven
- Ammunition and explosive Inertization by Tunnel

## Small, Medium and Large calibre Cutting Machine



## Points of Strength

- Experience in the demil technique
- Knowledge of ammunition
- Plant with the most advanced security system and the most modern machines and equipment
- Sinergy between demil and manufacturing of explosives for civil use recovering explosives coming out of ammunition
- Sensitivity to the environment and safety



# Services



In addition to its comprehensive product catalogue, the Ammunition Business Group offers an extended range of services able to meet a large customer demand through the whole life cycle of its products.

**Technology transfers:** The Ammunition Business Group can propose transfer of skills, engineering knowledge, technologies, methods of manufacturing and facilities to provide manufacturing capabilities from the component up to the ammunition. If necessary, these transfers are provided with a technical support related to the design of infrastructures and

equipment as well as training.

**Demilitarization:** The Ammunition Business Group also offers dismantling engineering support compliant with pyrotechnic and environmental regulations, in accordance with the particular nature of the stocks of pyrotechnic components and/ or conventional ammunition to be destroyed or recycled. If necessary, these services are provided with technical assistance as well as training.

**Ammunition storage facilities:** Storage of ammunition must satisfy strict rules. Failure to observe these rules can lead to dramatic accidents with many consequences (loss of life, legal prosecution, loss of operational capacity, etc.). The Ammunition Business Group can support the engineering tasks related to any ammunition storage facility while guaranteeing the best practice and full compliance with safety and environmental standards.

**Monitoring of ammunition stockpiles:** Most of the conventional ammunition life cycle is spent in the storage phase. The ammunition surveillance is one of the key points to insure the operational readiness of armed forces. The Ammunition Business Group as designer of any type of ammunition is able to support its customers for the monitoring of the ammunition stockpiles from the inspection to the dedicated facilities.





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