



ARTILLERY AMMUNITION



MARSHALL ENTERPRISES LLC

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ARTILLERY AMMUNITION



SHELL 155MM

HE ERFB BT

Rapid and accurate firing at long ranges to attack the ground targets by 155 mm Artillery Gun.

TECHNICAL SPECIFICATION

Maximum Range	: 30 km
Max. Chamber Pressure	: 345 \pm 8 MPa
Mass of Shell without Fuze	: 42.84 to 45.34 kg
Length of Shell without Fuze	: 843 mm
Shelf Life	: 10 years
Operating Temperature	: -20 °C to +60 °C

PACKAGING DETAILS

Packed in 12 nos. in 01 wooden pallet named unit load.
Length x Width x Height: 1130 mm x 990 mm x 580 mm

HAZARD CLASSIFICATION

Compatibility	: D
Hazard Division	: 1.1



ARTILLERY AMMUNITION



SHELL 155MM HE ERFB BBT

Rapid and accurate firing at long ranges to attack the ground targets by 155 mm Artillery Gun.

TECHNICAL SPECIFICATION

Maximum Range	: 38.4 km
Max. Chamber Pressure	: 345 \pm 8 MPa
Mass of Shell without Fuze	: 45.27 to 47.77 kg
Length of Shell without Fuze	: 861 mm
Shelf Life	: 10 years
Operating Temperature	: -20 °C to +60 °C
PACKAGING DETAILS	
Packed in 12 nos. in 01 wooden pallet named unit load.	
Length x Width x Height : 1128mm x 960mm x 562 mm	
HAZARD CLASSIFICATION	
Compatibility	: D
Hazard Division	: 1.1

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SHELL 155MM HE M107

Often used for training / practice, in addition to its normal role as anti-personnel, ammunition.



TECHNICAL SPECIFICATION

Maximum Range	: 18 km
Max. Chamber Pressure	: 386 MPa
Mass of Shell without Fuze	: 42.91 kg
Length of Shell without Fuze	: 604 mm
Shelf Life	: 15 years
Operating Temperature	: -20 °C to +60 °C

PACKAGING DETAILS

Packed in 12 nos. in 01 wooden pallet named unit load.
 Length x Width x Height : 880mm x 1060mm x 575 mm

HAZARD CLASSIFICATION

Compatibility	: D
Hazard Division	: 1.1

SHELL 155MM HE M77 B

Rapid and accurate firing at long ranges to attack the ground targets by 155 mm Artillery Gun.



TECHNICAL SPECIFICATION

Maximum Range	: 24 km
Max. Chamber Pressure	: 440 MPa
Mass of Shell without Fuze	: 41.7 kg
Length of Shell without Fuze	: 728 mm
Shelf Life	: 15 years
Operating Temperature	: -20 °C to +60 °C

PACKAGING DETAILS

Packed in 12 nos. in 01 wooden pallet named unit load.
 Length x Width x Height : 900 mm x 1060 mm x 556 mm

HAZARD CLASSIFICATION

Compatibility	: D
Hazard Division	: 1.1

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SHELL 155MM ILLUMINATING ERFB

Designed to support night warfare. The illumination provided by this ammunition is sufficient for identification and engagement of all types of moving and non-moving objects.



TECHNICAL SPECIFICATION

Maximum Range	: 25.58 km
Luminosity	: 750,000 Cd (Min)
Time of Burning	: 90 sec. (Min)
Mass of Shell with Fuze	: 42.84 to 45.34 kg
Length of Shell without Fuze	: 843mm
Shelf Life	: 10 years
Operating Temperature	: -20 °C to +60 °C

PACKAGING DETAILS

Packed in 12 nos. in 01 wooden pallet named unit load.
Length x Width x Height : 1128 mm x 990 mm x 562 mm

HAZARD CLASSIFICATION

Compatibility	: G
Hazard Division	: 1.3

SHELL 155MM SCREENING SMOKE ERFB

The shells are normally used to mask the movement or redeployment of own forces from enemy observation, thereby neutralizing direct enemy fire.



TECHNICAL SPECIFICATION

Maximum Range	: 24 km
Smoke Emission	: 90 sec (Min)
Descent Rate of Canister	: 5m/s
Mass of Shell without Fuze	: 43.5 kg nominal
Length of Shell without Fuze	: 878 mm
Shelf Life	: 10 years
Operating Temperature	: -20 °C to +60 °C

PACKAGING DETAILS

Packed in 12 nos. in 01 wooden pallet named unit load.
Length x Width x Height : 1128 mm x 990 mm x 562 mm

HAZARD CLASSIFICATION

Compatibility	: G
Hazard Division	: 1.2



ARTILLERY AMMUNITION 155MM PACKAGING INFORMATION

SR. NO.	DESCRIPTION	CALIBER	PACKAGING	DIMENSIONS of Pallet (mm)	PALLET WEIGHT (kg)	UN Code	Hazard Classification	No. of Shells per 20' Container
1	Shell 155 mm ERFB BT	155 mm	12 Nos. in one wooden pallet	1130 x 990 x 580	600	UN0463	1.1D`	240
2	Shell 155 mm ERFB BT	155 mm	12 Nos. in one wooden pallet	1128 x 960 x 562	600	UN0463	1.1D	240
3	Shell 155 mm M 107	155 mm	12 Nos. in one wooden pallet	880 x 1060 x 575	600	UN168	1.1D	288
4	Shell 155 mm Illg	155 mm	12 Nos. in one wooden pallet	1128 x 960 x 562	600	UN0254	1.3G	240
5	Shell 155 mm SMK	155 mm	12 Nos. in one wooden pallet	1128 x 960 x 562	600	UN0016	1.2G	240
6	BMCS - M91	Propellant for 155 mm	125 Nos. in one wooden pallet	1100 x 1050 x 1065	415	UN0242	1.3C	2,500
7	BMCS - M92	Propellant for 155 mm	125 Nos. in one wooden pallet	1100 x 1050 x 1065	540	UN0242	1.3C	2,500
8	Primer M 19 A	Propellant for 155 mm	560 Nos. in one plastic box, 18 Plastic boxes (10,080 Nos.) in a wooden pallet	1200 x 1000 x 822	500	UN0353	1.4G	1,60,000

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ARTILLERY AMMUNITION

FUZE PD ELECTRONIC

The Fuze is compatible to fire with 155mm Ammunition. It has two modes of operation i.e. Point Detonation Super Quick and Point Detonation Delay as per requirement.



TECHNICAL SPECIFICATION

Mass	: 1000 gms
Length	: 151 mm
Diameter	: 61 mm
Shelf Life	: 15 years
Operating Temperature	: -30 °C to +55 °C
The Fuze is safe for use in the muzzle velocity range of 180 to 1000 m/s and can withstand chamber pressure up to 397 ± 8 MPa	

FUZE PD M557P1

The Point Detonating M557P1 is an impact fuze used in the High Explosive projectiles of 155mm Howitzer. This Fuze complies fully with all NATO military specifications and test methods.



TECHNICAL SPECIFICATION

Mass	: 950 g
Length (Overall)	: 151 mm
Length (Visible)	: 96.4 mm
Thread	: 25.4 mm
Temperature Limits	
Operation	: -62oC to +71oC
Storage	: -54oC to +71oC
PACKAGING	
8 / 12 Fuzes per box, 2 metal boxes per wooden box	

ARTILLERY AMMUNITION

BI-MODULAR CHARGE SYSTEM

It is a state of the art replacement for conventional propellant charges.

BMCS M91

SINGLE BASE PROPELLANT

Low Zone (consisting of 1 to 2 low zone modules, for smaller ranges and training purpose)

BMCS M92

TRIPLE BASE PROPELLANT

High Zone (consisting of 3 to 5 high zone modules for 39 Cal, or 3 to 6 for 45Cal & 52 Cal)



TECHNICAL SPECIFICATION	BMCS M-91 (Single Base Propellant)	BMCS M-92 (Triple Base Propellant)
Maximum Range	12 km	40 km
Mass	1.9 kg	2.8 kg
Length	167mm (nominal)	167mm (nominal)
Muzzle Velocity	455 m/sec	878 m/sec
Shelf Life	15 year	15 years
Operating Temperature	-10 °C to +60 °C	-10 °C to +60 °C
PACKAGING DETAILS		
Each module is sealed in a multi-layered barrier bag with a protective packing piece. The barrier bags are partially vacuumed and hermetically sealed then packed in cylinder (with five modules) then put in palletised Unit (with 25 cylinder). Length x Width x Height: 1100 mm x 1050 mm x 1078 mm		
HAZARD CLASSIFICATION		
Compatibility	: C	
Hazard Division	: 1.3	



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DOUBLE BASE PROPELLANT

The product is used with 155 mm ammunition.

CHARGE 8



CHARGE 9



TECHNICAL SPECIFICATION	CHARGE 8	CHARGE 9
Length	735 ± 5 mm	740 ± 5 mm
OD	6.4 ± 0.30 m	12.1 ± 0.2 m
Hole Dia	3.30 ± 0.30 m	1.28 ± 0.04 m
Web	1.55 ± 0.05 m	2.02 ± 0.03 m
Cal Value	700 ± 25 Cal/gm	800 ± 25 Cal/gm
BALLISTICS	CHARGE 8	CHARGE 9
V of A	685 m/s at 21°C	827 m/s at 32°C
SD	3.2 m/s	3.5 m/s
ACP Mean	241 Mpa	309 Mpa
Range	19km	27 km

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CHARGE M4A2

Sb Propellant Charge M4A2 In White Bag, Cylindrical and Perforated Propellant Grain Used in 155 mm Bofors Howitzer Gun



PRESSURE	
P mean	218 Mpa
P average	153 to 190 Mpa
MUZZLE VELOCITY	
Zone	MV
3	274 m/s
4	347 m/s
5	403 m/s
6	482 m/s
7	569 m/s

PRIMER M191 A2

The Primer is composed of a finished metal alloy cartridge which contains various components sealed within. In the rear end of the primer there is plunger while a sealing disc, percussion cap and Gun powder charge (GPC-20) are placed within the inner case.



TECHNICAL SPECIFICATION	
Body of Projectile	: Brass
General Chemical Composition	: Combination of Potassium Nitrate, Charcoal & Sulphur
Cap F-26	: Combination of Lead Styphnate, Tetrazene, Barium Nitrate, Lead Dioxide & Antimony
Trisulphide	
Base Substance	: Potassium Nitrate
PACKAGING DETAILS	
It is packed in Plastic box viz. M31A containing 560 nos. each & 18 such plastic boxes packed in a box.	
Length x Width x Height : 1200 mm x 1000 mm x 822 mm	
HAZARD CLASSIFICATION	
Compatibility	: G
Hazard Division	: 1.4

ARTILLERY AMMUNITION



SHELL 130 MM HE

The 130 mm, gun M-46 is a long range medium gun and is capable of direct as well as

indirect laying fire. The gun is designed to :

- i) Destroy/neutralise hostile artillery including self propelled artillery.
- ii) Fight the enemy heavy tanks.
- iii) Destroy enemy pill boxes and strong field works.
- iv) Fire at enemy rear areas and concentration areas

TECHNICAL SPECIFICATION	
i) Weight of filled shell	31.50 to 32.60 kgs
ii) Filling type standard	TNT (3.43 kgs)
iii) Muzzle velocity	
a) For full variable charge	810 to 930 m/s
b) For reduced variable charge	525 to 705 m/s
vi) Maximum Range	
a) For full variable charge	22 to 27 km
b) For reduced variable charge	13 to 19 km
HAZARD CLASSIFICATION :	
Compatibility group	E
Hazard division	1.2

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FUZE DA - B429

Fuze B429 is a percussion type of nose fuze having direct, delay and Graze action. This fuze is used for Shell 130 mm HE Filled. The fuze can be set externally to 'I' and 'D' mode corresponding to '0' and '3' markings on fuze body respectively with the help of selector mechanism incorporated in fuze body.

TECHNICAL SPECIFICATION	
Mass of filled fuze	438 g
CE stemming density	1.40 to 1.60 g/cc
CE pellet density	1.53 to 1.61 g/cc
Mass of CE stemming	0.4 to 0.5 g
Mass of CE pellet	12.5 g

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SHELL 105 MM HEER (BB)



It is a high explosive extended range (HEER) Shell. Better fragmentation is achieved by introducing high quality steel alloy (AISI-9260) and thinning the body of the shell. The optimised ballistic shape of the shell improve the ballistic coefficient (Reduced drag) & provide better accuracy. The Base Bleed Unit (BBU) at base reduces the drag and gives additional thrust to carry the shell further.

TECHNICAL SPECIFICATION

Mass of filled Shell	15.765 kg
Muzzle Velocity	731 m/sec
Maximum Range	20.4 km
Length of Shell (plugged)	611 mm

HAZARD CLASSIFICATION

Compatibility	F
Hazard Division	1.2
Fire Fighting Division	2

PACKAGING DETAILS

One Wooden / Steel Box holding two Shells in laminated container

Length x Width x Height : 671 mm x 312 mm x 185 mm

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SHELL 105 MM HE



The ammunition is employed to demolish army concentrations, fortifications, bunkers and many other defence installations. This is suitable for use both in the plains as well as mountains.

TECHNICAL SPECIFICATION

Mass of the filled shell	16.97 kgs max
Muzzle velocity	591m/sec (normal charge) 710 m/sec (super charge)
Maximum range	17.6 km (Variable range can be achieved by using different types of cartg cases such as normal charge & super charge).
Shelf life	30 years

HAZARD CLASSIFICATION

Compatibility Group	F
Hazard Division	1.2
Fire Fighting Classification	2

PACKING DETAILS

One Wooden / Steel Box holding two Shells in laminated container
Length x Width x Height : 671 mm x 312 mm x 185 mm

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SHELL 105 MM ILLG



This ammunition provides intense illumination for identification and engagement of all types of stationary and moving objects.

The shell is fired with time mechanical fuze, present to ensure ejection at the desired height and range. The illuminant canister supported with parachute and spin break system provides intense illumination on the ground covering an area of 600 mtrs. radius.

TECHNICAL SPECIFICATION

Estimated mass	15.88 ± 0.1 Kgs
Net explosive content	800 gm (Approx)
Length	450 mm (Approx)
Diameter	104+0.2mm(Approx)
Maximum range	17 Kms
Height of burst	400 mtrs (Approx)
Time of burning	25 sec (min)
Luminosity	700,000 candela
Duration of illumination	30 sec (min)
Fuze	213P MK5 (M2)
Rate of descent	10 m/sec (max)
Shelf life	10 years.

HAZARD CLASSIFICATION

Compatibility Group	G
Hazard Division	1.2
Fire Fighting Classification	2

PACKING DETAILS

One Wooden / Steel Box holding two Shells in laminated container

Length x Width x Height : 671 mm x 312 mm x 185 mm

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SHELL 105 MM

BE SMOKE (SCREENING & COLOR)

The BE Smoke is used for screening and counter surveillance purpose in the combat field. It produces un form thick opaque screen over a wide area to facilitate tactical deployment of troops and shielding from direct enemy attack.

BE colour smoke is similar emission type smoke ammunition producing un form dense colour smoke in ed, orange and blue colours for signalling purposes.



TECHNICAL SPECIFICATION	
FOR COLOUR	
Estimated mass	15.970 Kgs
Net explosive content	Red - 450 gm (approx) Orange - 450 gm (approx) Blue - 410 gm (approx)
Length	450 mm (approx)
Diameter	104.5 + 0.2 mm (approx)
Time of burning (including built up time)	45 sec (min)
Fuze	213 T & P MK5 (M2)
Range	17 km (Max)
Shelf Life	10 years
FOR BE SMOKE	
Mass of filled bomb	17 Kgs
Length	450 mm (approx)
Diameter	104.5 + 0.2 mm (approx)
Duration of smoke	Over 45 sec
Range	11 Km
Smoke	Dense white
Shelf Life	10 years
HAZARD CLASSIFICATION	
Compatibility group	G
Hazard Division	1.2
Fire Fighting Classification	2
PACKING DETAILS	
One Wooden / Steel Box holding two Shells in laminated container	
Length x Width x Height : 671 mm x 312 mm x 185 mm	

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FUZE PERCUSSION

DA NO.117



Fuze 117 is a direct action and graze fuze. It is used in a variety of equipment, with HE, bursting smoke and chemical shells. It functions at low angle of impact and is rapid in action.

TECHNICAL SPECIFICATION

Mass of Filled Fuze	1.188 Kg \pm 10 gms.
Length of fuze	124.689 mm to 126.848 mm

PACKING DETAILS

Container 47B is used for packing of Fuze
Box M104 is used to hold 20 fuzes

HAZARD CLASSIFICATION

Compatibility Group	B
Hazard Division	1.2
Fire Fighting Classification	2

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FUZE 213 MK5

M1 & M2



Fuze 213 MK5 (M-1) & (M-2)

These are high precision mechanical time and impact fuzes which offer a choice of air burst at a desired point above the target or detonation on impact. Time setting is 0-80 seconds in steps of 0.5 seconds. Reliable and versatile the fuzes are compatible to all guns and howitzers from 75 mm to 152 mm calibers. M1 is used with HE shells whereas M-2 is employed with cargo shells/smokes base ejection type shells.

M3 & M4



Fuze 213 MK5 (M-3) & (M-4)

Very accurate mechanical time and direct action fuzes, specially suited for accurate laying of smoke screens, battle field illumination and release of cargo at the precise point over the target.

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CARTG. 105 MM

SUPER CHARGE & NORMAL CHARGE



Cartg 105 mm SC & NC is loosely assembled with the shell in the chamber of the gun to release required pressure to project the ammunition at a muzzle velocity sufficient to perform effectively at the target.

TECHNICAL SPECIFICATION SUPER CHARGE

Max mass of the cartg case	3.2 Kgs
Total weight of the propellant	3135 g
Muzzle velocity	712 m/sec
Maximum pressure	390 Mpa

TECHNICAL SPECIFICATION NORMAL CHARGE

Max mass of the cartg case	3.2 Kgs
Total weight of the propellant	2332 g
Muzzle velocity	591 m/sec
Maximum pressure	390 Mpa

HAZARD CLASSIFICATION

Compatibility	E
Hazard division	1.2
Fire Fighting classification	2

PACKING DETAILS

One Wooden / Steel Box holding four Cartgs. in laminated container

Length x Width x Height : 663 mm x 650 mm x 248 mm

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