2020

VAL TECHNOLOGIES



CATALOGUE OF DEFENCE INDUSTRY PRODUCTS

VAL TECHNOLOGIES LTD.

VAL TECHNOLOGIES

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EXPERTISE

- DEFENCE INDUSTRY PRODUCTS TRADING
- DEFECTATION OF ARMORED VEHICLES
- MODERNIZATION OF ARMORED VEHICLES

ABOUT US

Val Technologies Ltd. is a Bulgarian company specialized in production, trade, repair, import and export of defense-related products.

The company's focus is in the field of armored vehicles, artillery armament and fire control systems, military and chemical engineering techniques. It develops projects of repairs organization, determines the amount of activities necessary to recover the technical resource of the machines, defects, stationary and polygon tests, gives an opinion on the quality of the repair and makes recommendations for removing identified inconsistencies. It supplies all types of spare parts for armored, automotive, aircraft and naval equipment, supplies and installs equipment for individual projects.

The company is fully authorized by the Bulgarian authorities to conduct trading activities with arms and defense related products in compliance with the national and the EU legal framework. It possesses all licenses for export, import and transfer of weapons and military products. Val Technologies Ltd. has wide network of business contacts that enables the company to supply in due time vast portfolio of military goods and technology.

EXPERIENCE

The company employs highly qualified specialists with military education and long experience in the armored vehicles equipment, who have gone through all levels of the logistic structures in the Ministry of Defense of the Republic of Bulgaria and experts in armored vehicles repairing. The company General Manager develops the Product 1300 catalog (BMP-23), and has been responsible for the organization of military tests and the implementation of products in the Bulgarian Army.

EXPERTISE

❑ DEFENCE INDUSTRY PRODUCTS TRADING

- Vehicle equipment (BMP-1, BMP-2, BTR-80, BRDM-2, Tank T-72, Tank T-55, etc.)
- Spare parts (BMP-1, BMP-2, BMP-3, BTR-80, BRDM-2, Tank T-55, Tank T-72, Tank PT-76, BTR-50 PU, , engines for ships and aircraft, etc.)
- Armament, equipment and ammunition

❑ DEFECTATION OF ARMORED VEHICLES

- Defectation before repair
- Determination of the amount of repair work to restore the technical state of the technics
- Making recommendations and offering counseling for the organization of the repairs
- Defectation after repair
- Determination of the technical parameters of the different systems and aggregates that have been repaired
- Performing a repair quality analysis and making recommendations for removing inconsistencies

❑ MODERNIZATION OF ARMORED VEHICLES

I. Developing a tactic-technical assignment about the modernization:

- Tank T-72 to level T-72B3
- BMP-1 and BMP-2
- BTR-60 and BTR-70 to level BTR-80
- Upon request

II. Carrying out a study and offering alternatives for the volume of modernization

III. Evaluating of the assessment of the experimental sample and making recommendations for correcting identified inconsistencies

IV. Preparing a program and methodology for testing the experimental sample

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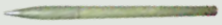
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ASSAULT RIFLE M70

Assault rifle M70 is designed based on the Kalashnikov principle, but with some alterations of the basic AK design (milled receivers, threaded barrels, gas cutoffs for grenade launching etc). It is still very popular, because it has confirmed its reliability in all environments.



Basic tactical and tehnical characteristics:

Caliber	Barrel length	Rate of fire
7,62 x 39 mm	415 mm	620 ± 60 rds/min

Models:

M70 **B1**

(image on top)



Length	920 mm	915/672 mm
Weight:	4,17 kg	3,97 kg

Complete set:

- Assault rifle M70 B1
- 4 spare magazines
- Sling
- Blank ammunition attachment
- Rifle grenade
- Accessories
- Handling and maintenance manuals

Optionally, the set includes:

+ Picatinny rail, enables the assembly of optical-electronic devices



+ BGP 40 mm M70



ASSAULT RIFLE M92

Assault rifle M92, developed based on assault rifle M70, is customized for usage in closed and limited space: rooms, vehicles, armored and unarmored combat vehicles etc.



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Basic tactical and tehnical characteristics:

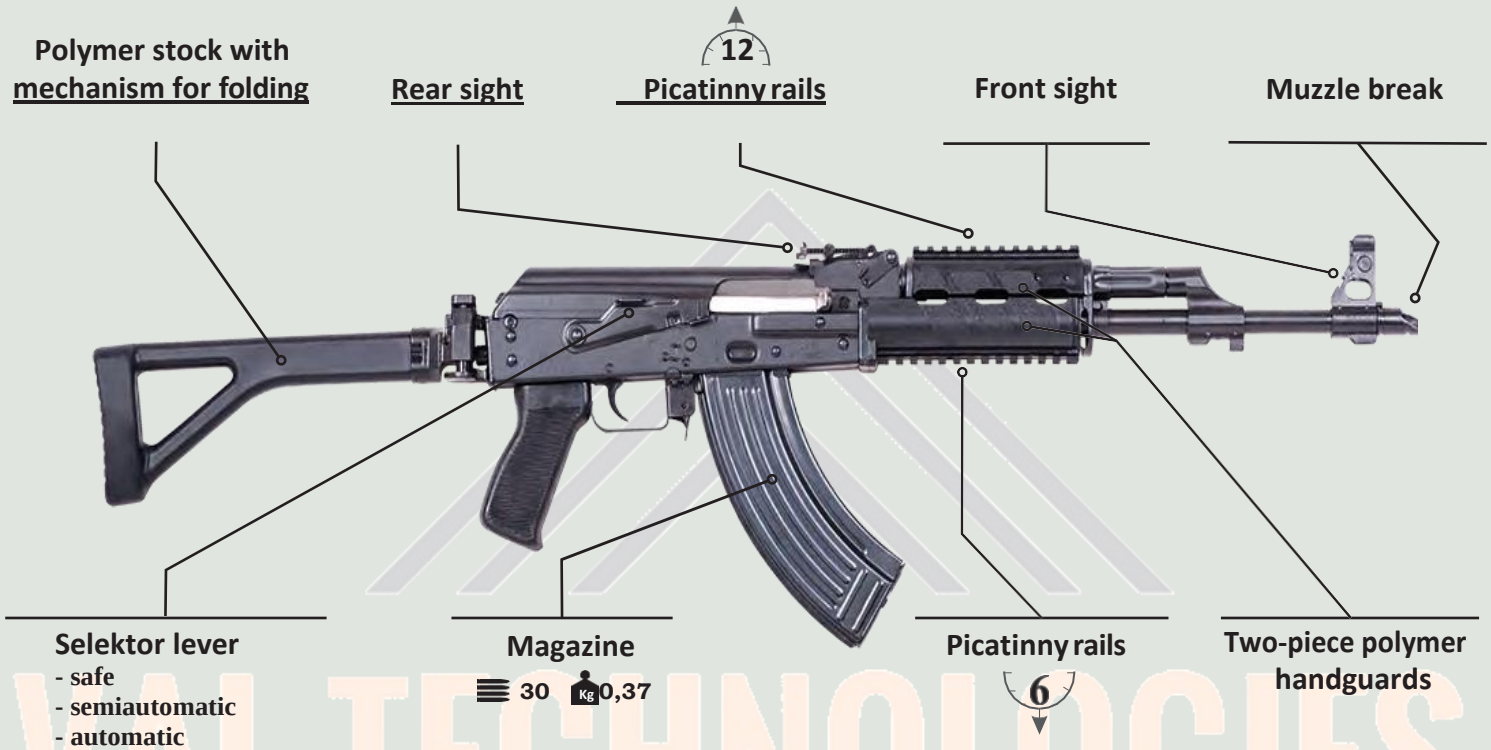
Caliber	Barrel length	Length		Weight:	Rate of fire
		Total lenght	Folded stock		
7,62 x 39 mm	254 mm	795 mm	550 mm	3,57 kg	620 ± 60 rds/min

Complete set:

- Assault rifle
- 4 spare magazines
- Sling
- Accessories
- Handling and maintenance manual

ASSAULT RIFLE M05

Assault rifle M05 belongs to a group of new models of assault rifles caliber 7.62x39 mm. All excellent characteristics of assault rifles M70 are kept in this model and many upgraded characteristics are the result of modern tactic demands.



Basic tactical and tehnical characteristics:

Caliber	Barrel length	Length		Rate of fire
		Total lenght	Folded stock	
7,62 x 39 mm	415 mm	934 mm	689 mm	620 ± 60 rds/min

Models:

M05 E1

basic model (*image on top*)
no possibility of attaching optical sight mount to the receiver

4,05

M05 E2

carrier for Picatinny rail on the left side of the receiver

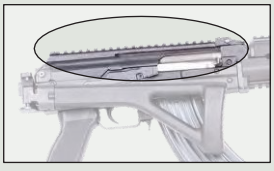
4,15



M05 E3

Picatinny rail on the top of the dust cover

4,25



Complete set:

- Assault rifle
- 4 spare magazines
- Sling
- Accessories
- Handling and maintenance manual

Optionally, the set includes:

+ Picatinny rails



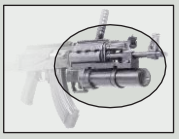
+ BGP 40mm



+ Polymermagazine



+ BGP40x46 mm



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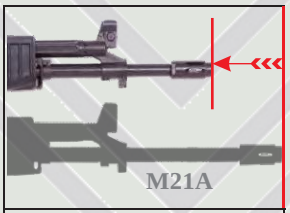
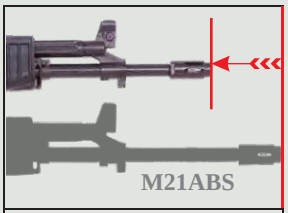
ASSAULT RIFLE M21

Assault rifle M21 belongs to a group of new models assault rifles from based on assault rifle M05 in caliber 5,56 x 45 mm.



Models and basic tactical and tehnical characteristics:

	M21 A	M21 S	M21 ABS	M21 SBS
	The base fixed on the left side of the receiver for Picatinny rails or various types of optical and electronic devices	Barrel length is shorter for - 85 mm	Two-piece handguards with Picatinny rails and Picatinny rail on the top of the dust cover	Barrel length is shorter for - 85 mm
				
Total lenght/ Folded stock	1000/750 mm	915/666 mm	1000/750 mm	915/666 mm
Barrel length:	460 mm	375mm	460 mm	375 mm
Weight:	4,15 kg	4,07 kg	4,3 kg	4,2 kg

Complete set:

- Assault rifle
- 4 spare magazines
- Sling
- Accessories
- Handling and maintenance manual

Optionally, the set includes:

+ Picatinny rail for models M21 A and S 

+ BGP 40mm for all models 

+ Handle for BS models 

+ Polymer magazine for all models 

+ BGP 40x46mm for BS models 

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SNIPER RIFLE M76

Semi-automatic sniper rifle M76 is developed in the mid-1970s. With the caliber 7,92×57mm Mauser and exception of the gas regulator, disassembly and operation are similar to that of the M70 family of weapons.



Basic tactical and tehnical characteristics:

Caliber	Number of grooves	Barrel length	Length	Weight without OS	Maximum effective range
7,92 x 57 mm	4	550 mm	1135 mm	4,6 kg	1000 m

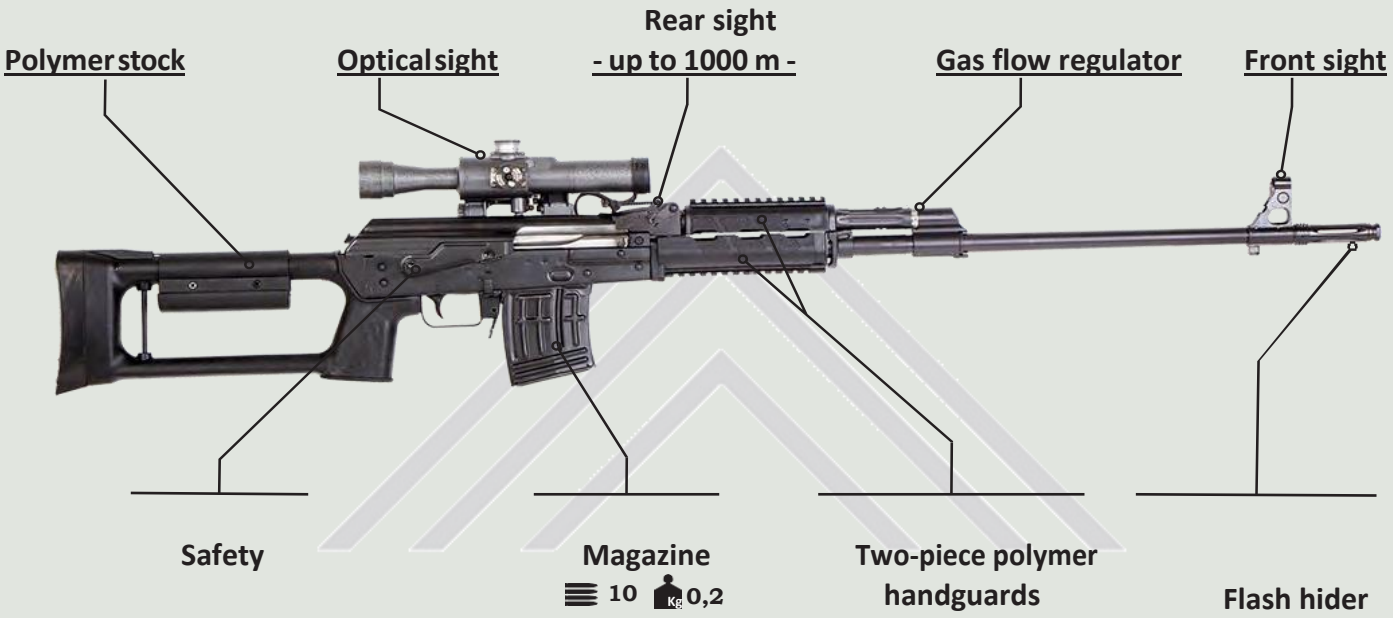
- Rifle sights: telescopic sight ZRAK ON-M76 4×5°10' with bullet drop compensation markings and the radioactive illumination warning, mechanically adjustable iron sights with a sliding tangent rear sight which can be adjusted from 100 m to 1.000 m, rifle telescopic scope M93 6x32 and night telescopic sight 5x80.
- Optionally, it uses also Suppressor (give suffocation - 10 dB with standard ammunition and -20 dB with special ammunition)

Complete set:



SNIPER RIFLE M91

Semi-automatic sniper rifle M91 is designed based on the Kalashnikov system. The basic request of police and army forces - exceptional precision at large distances - is fulfilled and confirmed in extreme conditions.



Basic tactical and tehnical characteristics:

Caliber	Number of grooves	Twist rate	Barrel length	Weapon length	Weight with OS	Maximum effective range
7,62 x 54R mm	4	240 mm	620 mm	1200 mm	5,5 kg	1000 m
7,62 x 51 mm	6	254 mm				

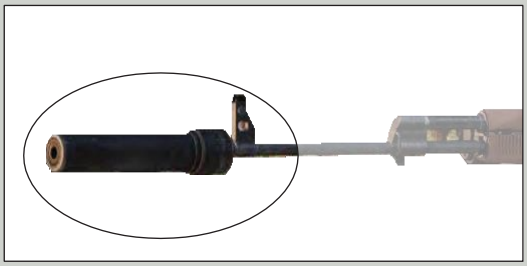
- The rifle has two safety systems: 1. mechanical safety with two positions: safe / fire 2. safety system that prevents firing before the bolt is locked.
- Gas flow regulator enables using the weapon in extreme conditions and also when the weapon is very dirty.
- The base fixed on the left side of the receiver enables assembling various types of optical and electronic devices.
- Silencer can be quickly and easily assembled to the rifle; it reduces the noise level by at least 12dB and gives wrong impression about the position of the sound source.

Complete set:

- Sniper rifle M91
- 4 spare magazines
- Sling
- Optical sight
- Cleaning kit
- Bag
- Handling and maintenance instruction manuals

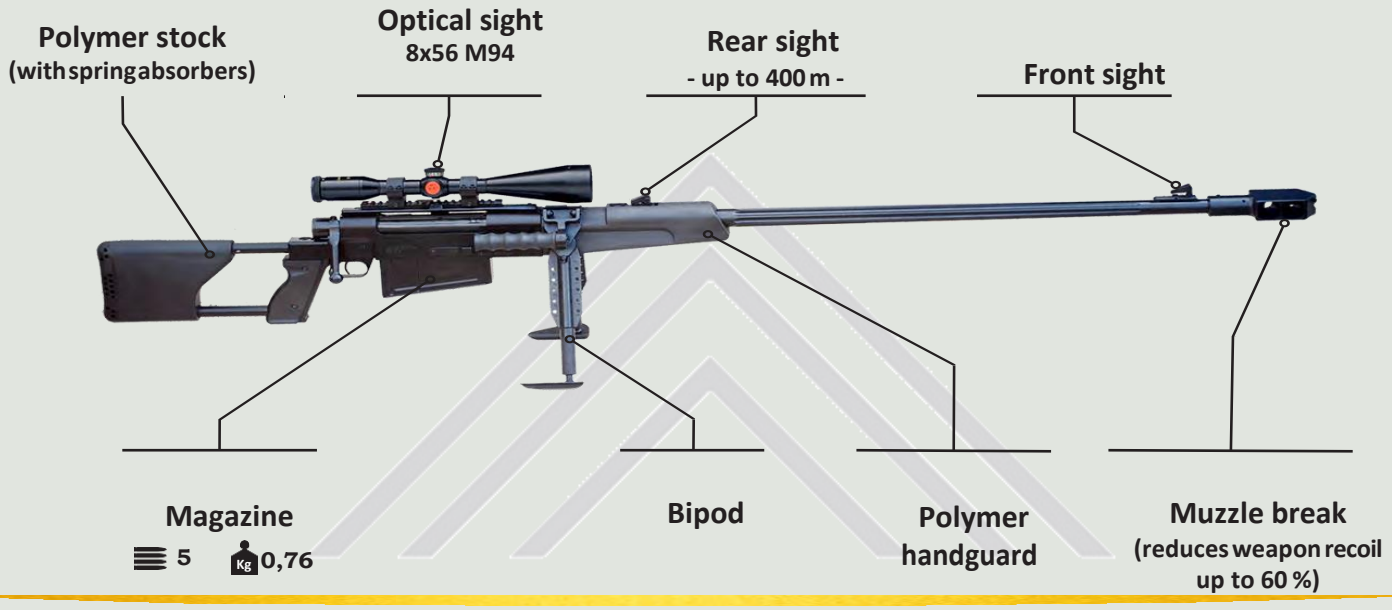
Optionally, the set includes:

+ Silencer



LONG RANGE RIFLE M93

Long range rifle M93 is designed based on the Mauser action system, which is proven to be a precise and reliable system of bolt-action guns. Its purpose is ellimination of varyious types of targets at large distances, up to 1800 m, in all conditions and environments.



Basic tactical and tehnical characteristics:

Caliber	Number of grooves	Twist rate	Barrel length	Weapon length	Weight with OS	Maximum effective range
12,7 x 108 mm	8	381 mm	1007 mm	1670 mm	16,7 kg	1800 m
12.7 x 99 mm (.50 Browing)			837 mm	1500 mm	16,3 kg	

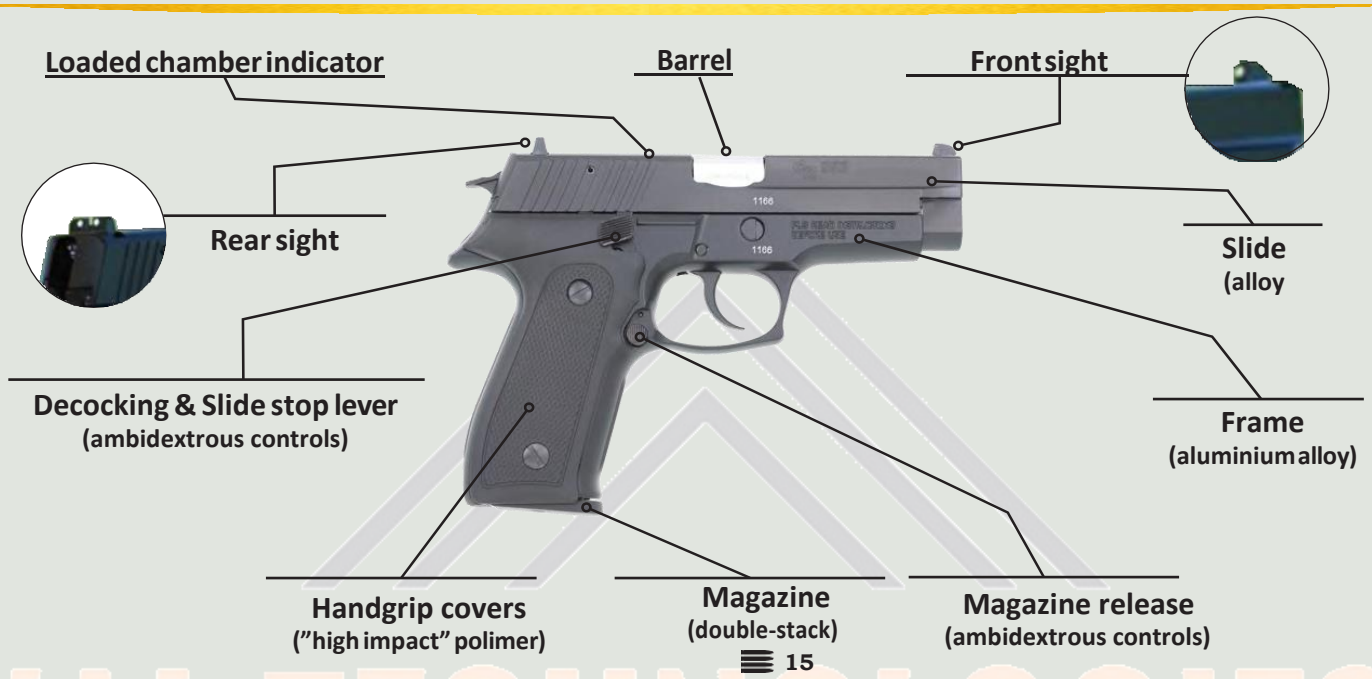
- Long range rifle M93 is designed with two calibers: 12,7x108 mm and 12,7x99 mm (.50 Browing).
- Cold forged heavy barrel with chrome plated interior provides exceptional precision at large distances. Flutes on the barrel exterior make the cooling easier and provide precision in hard conditions.
- Handguard and stock are made of polymer, reinforced with glass fibres. Stock has absorbers that reduce the recoil efect on the shooter.

Complete set:

- Long range rifle M93
- Optical sight
- Tools
- Accessories
- Carrying case / holster
- Bag for spare tools and accessories
- Ammunition bag
- Ear protection
- Handling and maintenance manuals

P I S T O L CZ 999

Pistol CZ999 is a modern weapon used as a service gun or a personal defense gun. Due to its excellent design solutions, ergonomics and state-of-the art technology in production, this weapon stands out with its precision, accuracy and functionality.



Models and basic tactical and tehnical characteristics:

CZ 999 Compact

Total lenght	188 mm
Barrel length:	98 mm
Weight:	0,9 kg



(image on top)

CZ 999

Total lenght	198 mm
Barrel length:	108 mm
Weight:	0,94 kg

Caliber:	9 mm PARA

- The pistol is a semi-automatic weapon, functioning on the short recoil of the barrel principle.
- Locking is achieved by vertical oscillation of the barrel that comes into the hole on the slide.
- The pistol functions as a single action or a double action gun.
- The pistol has ambidextrous controls - it can be operated by right or left hand.
- Standard finish includes phosphatizing and painting of aluminum parts, while the steel parts are blued.

Complete set:



Pistol with magazin

Spare magazine

Cleaning kit

Handling and maintenance instruction manual

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MACHINE GUN M84

Machine gun M84 is designed based on the Kalashnikov system, with the gas flow regulator and gas tube placed under the barrel.





Light machine gun M84



Basic tactical and tehnical characteristics:

Caliber	Number of grooves	Twist rate	Barrel length	Weight with tripod	Weight tripod base	Maximum effective range	Rate of fire
7,62x54Rmm	4	603 mm	1190 mm	13,3 kg	5 kg	1000 m	700 - 800 rds/min

Complete set:

- Light machine gun M84
- Belt for 250 cartridges
- Box for the 250 cartridges belt
- Belt for 100 cartridges
- Box for the 100 cartridges belt
- Sling
- Blank ammunition attachment
- Spare parts
- Tools and accessories
- Sling for tripod base
- Sling for ammunition box
- Handling and maintenance manuals
- Packing case

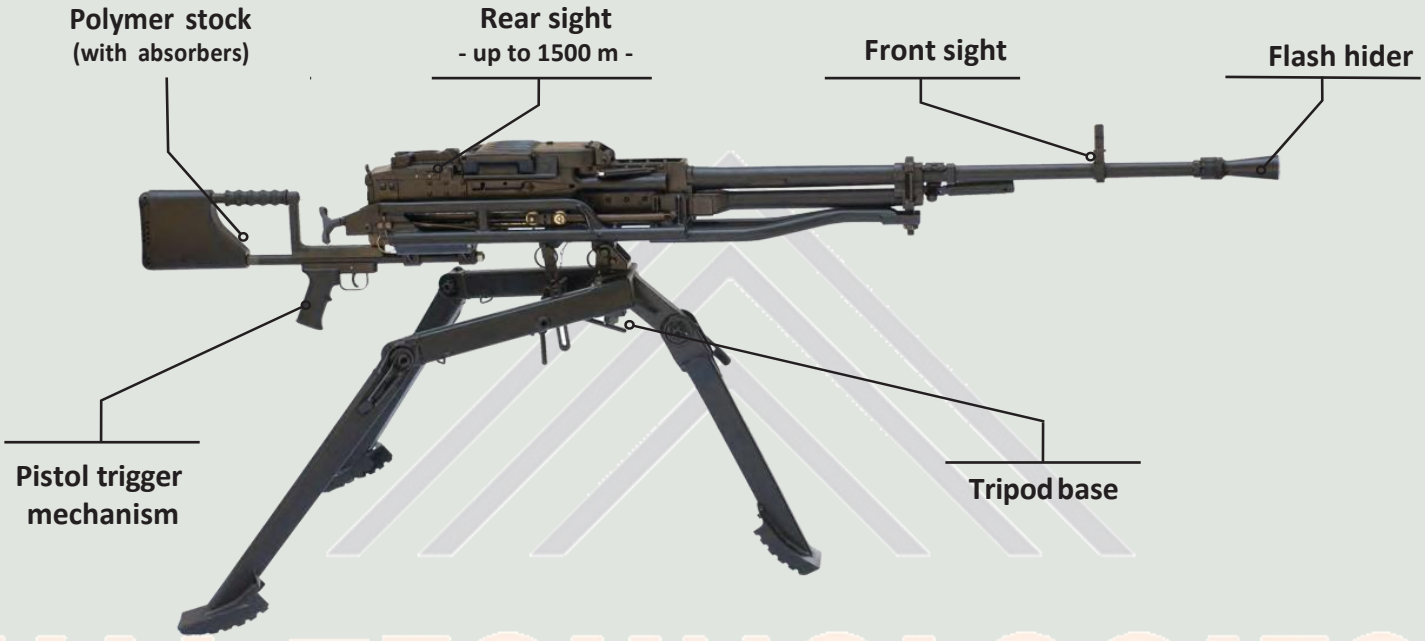
Optionally, the set includes:

+ Optical sight with mount
+ Spare barrel
+ Belt filler



MACHINE GUN M02

Machine gun M02 Coyote is formed by mounting the machine gun M87 to the cradle connected with the tripod. Machine gun M87 is licensed product based on the Soviet machine gun NSV.



Basic tactical and tehnical characteristics:

Caliber	Number of grooves	Twist rate	Barrel length	Weight with tripod	Weight tripod base	Maximum effective range	Rate of fire
12,7x108mm	8	1100 mm	1970mm	48,8 kg	24 kg	1500 m	700 rds/min

- Optionally, is is posible to mount an optical sight, which with pistol trigger mechanism and stock with spring absorber allows precise fire on long distance.
- Machine gun is designed with two calibers: 12,7x108 mm and 12,7x99 mm (.50 Browing).
- Machine gun is fed from a belt placed in the ammunition box with the capacity of 60 rounds. After firing, cartridge cases are ejected forward, which incrases the safety of the shooter and the crew around him.

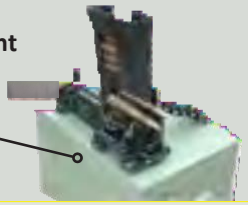
Complete set:

- Machine gun M02
- Spare barrel
- 36 short belts for 10 cartridges
- 3 ammunition boxes
- Spare parts
- Tools and Accessories
- Handling and maintenance manuals
- Wooden packing case

Optionally, the set includes:

+ Optical sight with mount

+ Belt filler



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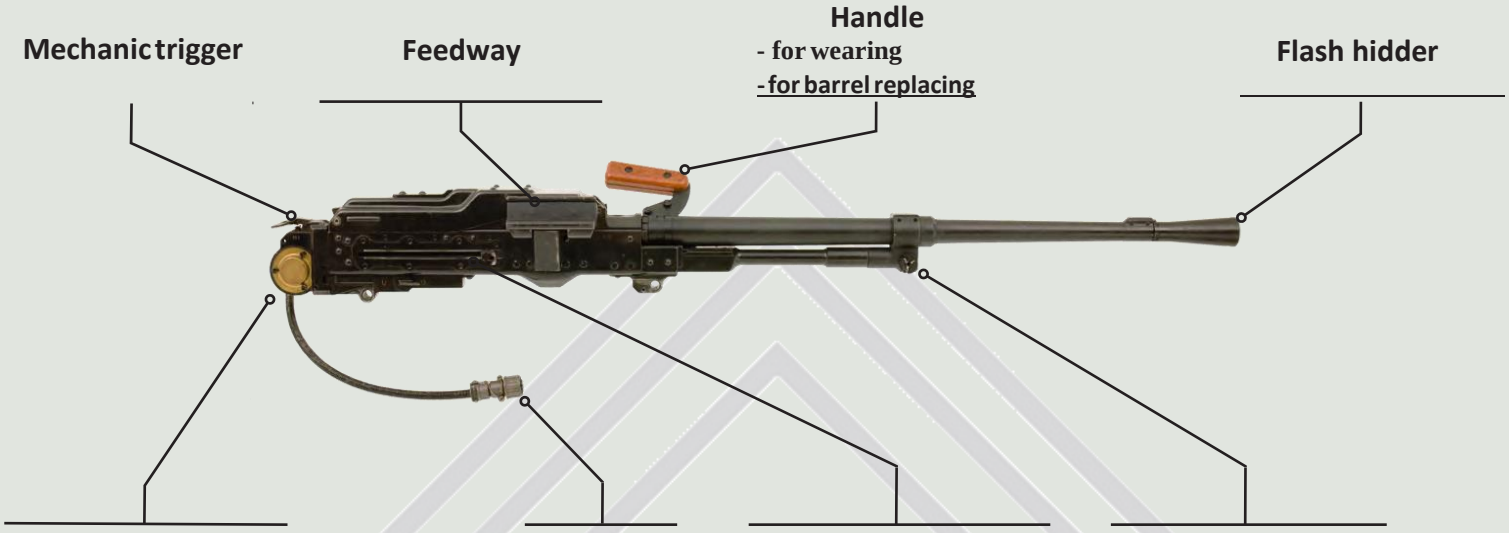
MACHINE GUN M86

Machine gun M86 is a licensed gun based on the Soviet machine gun 7,62 mm PKT (Пулемёт Калашникова Танковый). The machine gun is designed for equipping tanks, armored vehicles, helicopters, armored boats and other war materiel.



Basic tactical and technical characteristics:

Caliber	Number of grooves	Barrel length	Weapon length	Weight	Rounds in belt	Maximum effective range	Rate of fire
7,62x54R mm	4	780 mm	1100 mm	11,6 kg	250 rds	1000 m	700 - 800 rds/min

Complete set:

- Machine gun M86
- Belt for 250 rounds
- Ammunition box for belt (250 rds)
- Spare parts
- Tools
- Accessories
- Handling and maintenance manuals
- Wooden packing case

Optionally, the set includes:

+ Spare barrel
+ Belt filler



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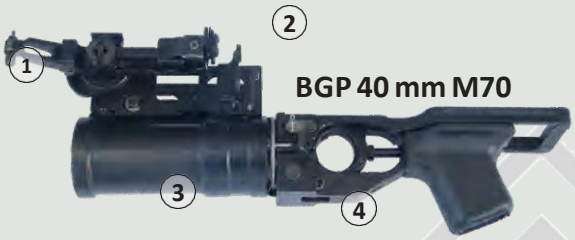
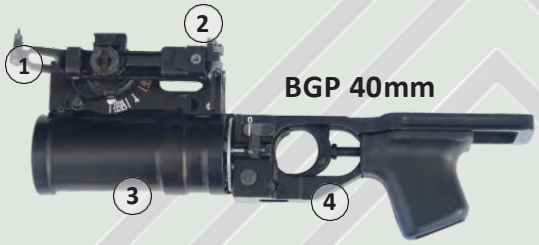
UNDERBARREL GRENADE LAUNCHER BGP 40 mm

Grenade launcher is a weapon that with great precision creates the explosion effect of a hand granade at distances characteric for a thromblone mine.

1 - Front sight 2 - Rear sight 3 - Barrel 4 - Mechanic trigger







Basic tactical and technical characteristics:

Caliber	Number of grooves	Barrel length	Weapon length	Weight	Sight division for direct aiming	Sight division for indirect aiming
40 mm	4	120 mm	323 mm	1,5 kg	50 - 400 m	250 - 350 m

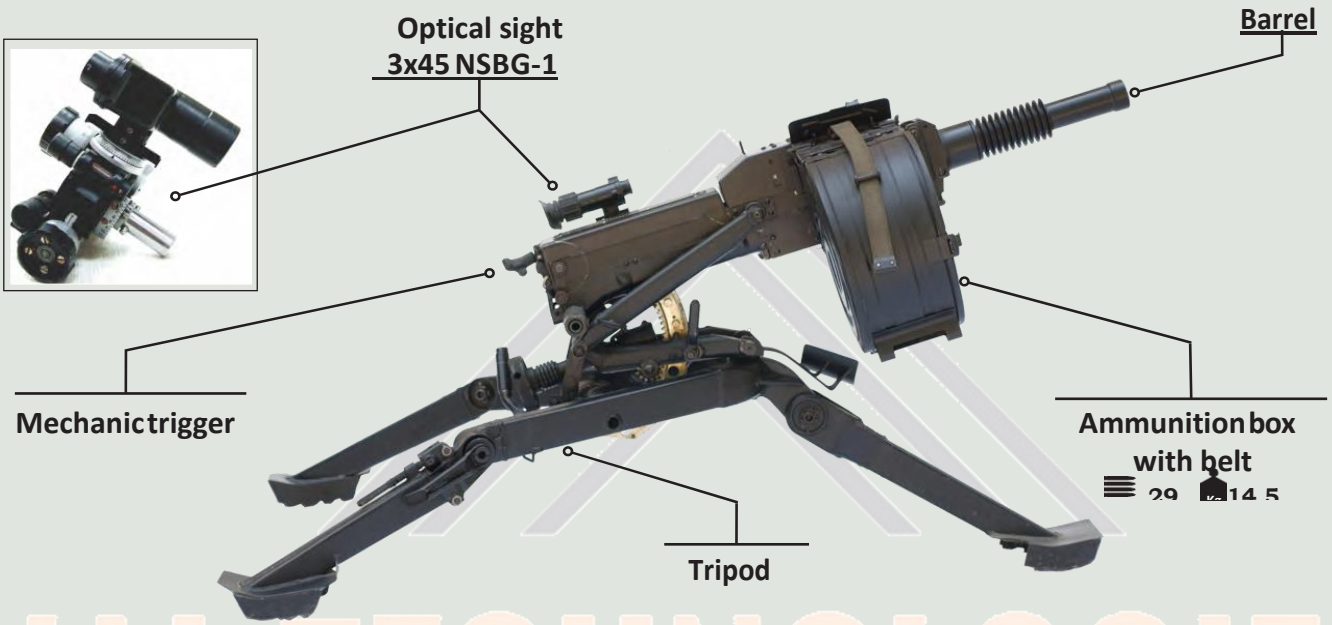
- Model BGP 40 mm M 70 is mounted to assault rifles M70 B1 and M 70 AB2. Model PBG 40 mm is mounted to assault rifles M70 B3, M70 AB3 and all models of M21. Model PBG 40 x 46 mm is mounted to all assault rifles with 12 o'clock and 6 o'clock Picatinny rails on the handguards.
- BGP functions only when it is mounted to an assault rifle; it cannot function on its own.
- This is a muzzle loaded weapon.
- Front and rear iron sight are used for direct aiming and plummet is used for indirect aiming.
- It can fire grenades with anti-personnel, anti-tank, incendiary, smoke and training projectiles.

Complete set:

- Underbarrel grenade launcher
- Holster
- Bag for grenades
- Barrel cleaning brush
- Rubber buffer for assault rifles with folding stock
- Buffer sling
- Handling and maintenance manuals

AUTOMATIC GRENADE LAUNCHER M93

Automatic grenade launcher M93 is an infantry weapon designed for annihilation of covered and uncovered live forces, as well as for destruction of light armored combat means.



Basic tactical and technical characteristics:

Caliber	Barrel length	Weapon length	Weight with tripod	Weight of tripod	Maximum effective range	Muzzle velocity
30 mm	300 mm	865 mm	38 kg	14 kg	1700 m	185 m/s

- M93 can only fire bursts, with the rate of fire from 50 to 400 grenades per minute.
- The weapon is fed from a 30rd belt with 29 grenades, placed in the ammunition box.
- The launcher can fire grenades with anti-personnel, anti-tank, incendiary, smoke and training projectiles.
- The design of the tripod enables quick change of combat position. Depending on tactical requirements and at the customer's request, the automatic grenade launcher can be mounted to various types of combat vehicles.

Complete set:

- Automatic grenade launcher M93
- Tripod
- Aiming device NSBG-1
- 6 ammunition belts
- 3 ammunition boxes
- Tripod sling
- Carrying bag
- Spare parts, tools and accessories
- Handling and maintenance manuals
- Wooden packing case

Optionally, the set includes:

+ Belt filler

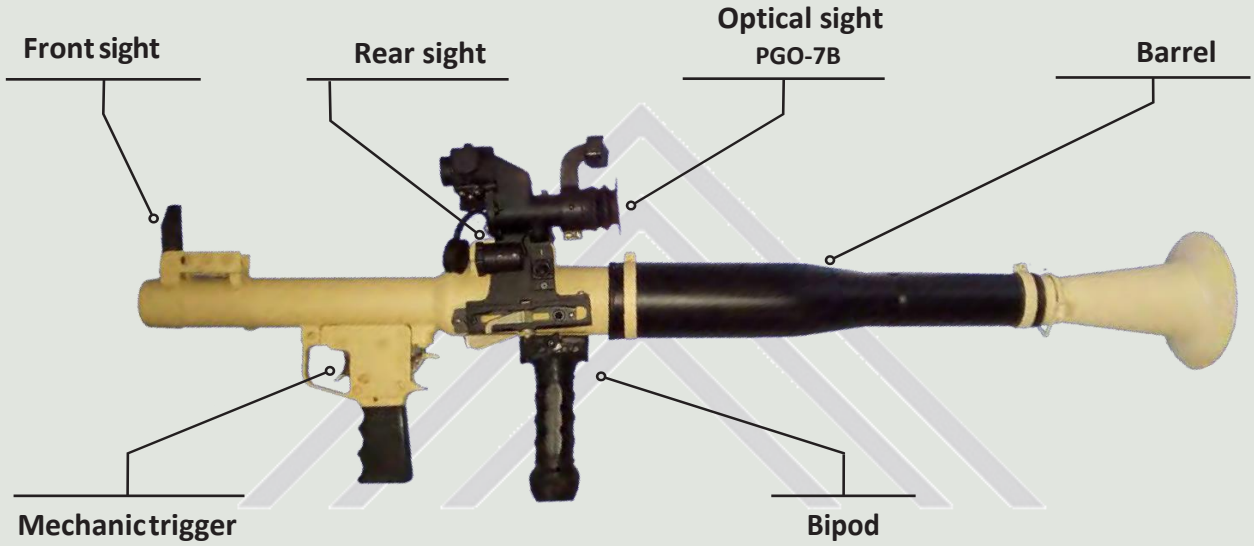


+ Rectification sight



ROCKET PROPELLED GRENADE LAUNCHER RBR7

RBR7 is a modern of version Soviet grenade launcher RPG7, the most used anti-armor weapon in the world. It is designed for usage against hostile armoured vehicles, mechanized troops and against enemy personnel in open space, in tranches and in light field-type shelters.



Basic tactical and technical characteristics:

Caliber	Lenght	Weight without grenade	Maximum effective range	Muzzle velocity	Maximum velocity	Rate of fire
40 mm	960 mm	7 kg	500*-2000**m	70 - 152 m/s	300 m/s	4 - 6 rds/min

- RBR 7 uses standard ammunition of all world manufacturers.
- Effective range of antitank grenade with HEAT warhead is 500* m.
  Characteristics of the HEAT grenade:
  - armour penetration : 760 mm
  - brick penetration: 2000 mm
  - concrete penetration:1500 mm.
- Effective range of the grenade fragmentations is 2000** m.
- RBR 7 can fire inside of the buildings, if the walls and other obstacles are at least 2 m away.

Complete set:

- Barrel
- Optical sight
- Cleaning kit
- Tools and accessories
- Handling and maintenance manuals

ROCKET PROPELLED GRENADE LAUNCHER RPG-22

RPG-22 is a disposable, single shot rocket launcher pre-loaded with fin-stabilized rocket. It is an improved version of the earlier RPG-18 weapon.



PG-22 anti-tank HEAT grenade



1 - Sling
2 - Rear cover
3 - Main barrel tube (container)
4 - Firing mechanism
5 - Rear sight
6 - Telescoping barrel extension
7 - Front sight
8 - Front cover

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Basic tactical and technical characteristics:

Caliber	Lenght transport/ combat	Weight granade	Weight	Direct fire range	Maximum effective range	Muzzle velocity	Deployment time
72,3 mm	785/850 mm	1,48 kg	2,7 kg	150 m	250 m	133 m/s	8 - 10 s

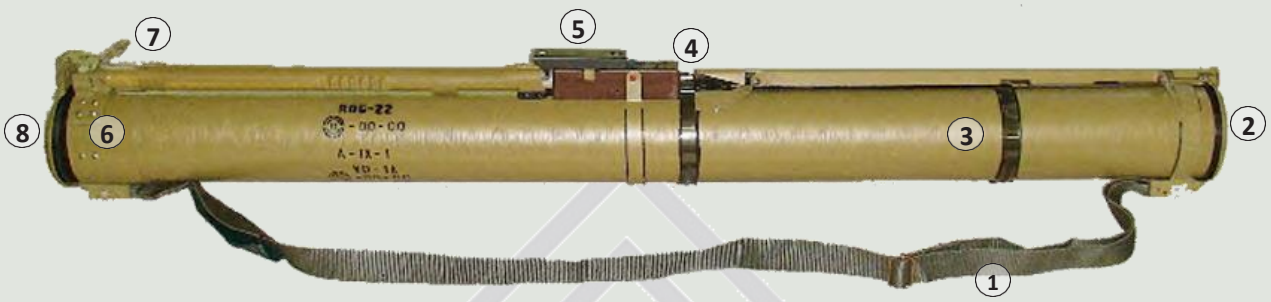
- The shaped charge (HEAT) warhead is loaded with 360 g of explosive charge, resulting in armor penetration of up to 400 mm of homogenous steel armor brick penetration - 1000 mm and concrete penetration - 1500 mm.
- RPG22 smoothbore barrel / container is made of two parts, a main tube and a telescoping forward extension, which slides over the barrel, both made of fiberglass.
- The grenade is placed in the barrel tube, and its solid-fuel motor burns out completely within the barrel.
- Since the barrel is open at the rear to avoid recoil, there is a dangerous backblast area behind the firing weapon, at least 15 meters (45 ft) long.

Complete set:

- 8 launchers in a case
- Wooden packing case:
  * dimensions: 860 x 688 x 364 mm
  * gross weight: 48 kg

ROCKET PROPELLED GRENADE LAUNCHER ROG-22

ROG-22 rocket fragmentation grenade is an individual disposable weapon and it is intended for defeating the enemy manpower located in the open, in trenches, in field-type shelters, stone, brick and concrete structures, light armored and unarmored vehicles or shelters.



OG-22 fragmentation grenade



1 - Sling
2 - Rear cover
3 - Main barrel tube (container)
4 - Firing mechanism
5 - Rear sight
6 - Telescoping barrel extension
7 - Front sight
8 - Front cover

VAL TECHNOLOGIES

Basic tactical and technical characteristics:

Caliber	Weight granade	Weight	Direct fire range	Maximum effective range	Fragmentation effect	Muzzle velocity	Deployment time
72,3 mm	2,628 kg	4,2 kg	90 m	350 m	864pcs 0,9 g fragments	76 m/s	8 - 10 s

- OG 22 fragmentation grenade destroys the targets by means of performed fragments filled with powerful high explosive.
- ROG22 smoothbore barrel / container is made of two parts, a main tube and a telescoping forward extension, which slides over the barrel, both made of fiberglass.
- The grenade is placed in the barrel tube, and its solid-fuel motor burns out completely within the barrel.
- Since the barrel is open at the rear to avoid recoil, there is a dangerous backblast area behind the firing weapon, at least 15 meters (45 ft) long.

Complete set:

- 6 launchers in a case
- Wooden packing case:
  * dimensions: 1020 x 528 x 346 mm
  * gross weight: 56 kg

ROCKET PROPELLED GRENADE LAUNCHER DRTG-73

DRTG-73 rocket grenade launcher is a disposable individual weapon and is intended for destroying armored mechanized troops (including ERA-equipped vehicles) as well as enemy manpower in field and urban type fortifications.



TG-73 tandem grenade



1 - Sling
2 - Rear cover
3 - Main barrel tube (container)
4 - Firing mechanism
5 - Rear sight
6 - Telescoping barrel extension
7 - Front sight
8 - Front cover

VAL TECHNOLOGIES

Basic tactical and technical characteristics:

Launcher calibre	Caliber main warhead	Caliber precursor warhead	Armor penetration	Muzzle velocity	Direct fire range	Deployment time
73 mm	72,3 mm	40 mm	400 mm (+ ERA)	120 m/s	130 m	8 - 10 s

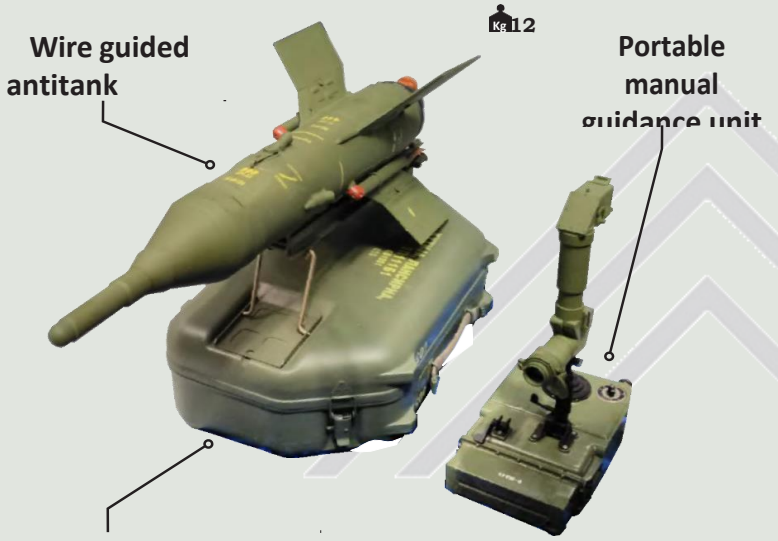
- DRTG-73 smoothbore barrel / container is made of two parts, a main tube and a telescoping forward extension, which slides over the barrel, both made of fiberglass.
- The grenade is placed in the barrel tube, and its solid-fuel motor burns out completely within the barrel.
- Since the barrel is open at the rear to avoid recoil, there is a dangerous backblast area behind the firing weapon, at least 15 meters (45 ft) long.

Complete set:

- 8 launchers in a case
- Wooden packing case:
  * dimensions: 860 x 688 x 346 mm

ANTITANK SYSTEM «MALYUTKA»

Antitank system MALYUTKA is formed of wire guided antitank missile installed on a manual (MCLOS) or semiautomatic (SACLOS) guidance . The missile can be launched from the portable launching box or from special launcher adapted for combat vehicles and helicopters.





System adapted for combat vehicles and helicopters



Basic tactical and technical missile characteristics:

	Weight	Caliber/ wingspan	Lenght	Fly speed	Minimal/ maximal range	Penetrating capability up to	Specifics
9M14M	10,9 kg	120 / 393 mm	860 mm	120 m/s	500 - 3000 m	400 mm	control: only manual
9M14MP1	11 kg	120 / 460 mm	865 mm	120 m/s	500 - 3000 m	460 mm	increased penetration
9M14MP1B1	11 kg	120 / 460 mm	890 mm	120 m/s	500 - 3000 m	580 mm	increased penetration
MALYUTKA 2M	13,4 kg	120 / 460 mm	1097 mm	110 m/s	500 - 2800m	800 mm	increased penetration
MALYUTKA 2T	13,8 kg	120 / 460 mm	1264 mm	110 m/s	500 - 2800m	ERA + 800 mm	double (tandem) HEAT warhead
MALYUTKA 2F	13,5 kg	90 / 460 mm	968 mm	110 m/s	500 - 2800m	8 kg TNT	fragmentation warhead

Complete set:

Guiding desk



- Control panel
- Launching knob
- Control lamp
- Switch
- Joystick
- Telescopic sight holder
- Optical sight 9Sh16 8 x 22°

or

Wooden box with one missile



VAL TECHNOLOGIES

ANTITANK SYSTEM 9K111

9K111 system is formed of wire guided antitank missile installed on semiautomatic guidance. It is designed for destroying visual moving and stationary armored targets, as well as other targets on the ground.

9M111 -2 FAGOT



9M111-M FAKTORIA



9K111
SEMIAUTOMATIC GUIDANCE



1 - Tripod 2 - Portable launching units 3 - Containers with missile 4 - Optical sight

Basic tactical and technical characteristics:

	Caliber	Missile weight	Armory penetration	Minimum effective range	Maximum effective range	Average flight speed	Fire rate	Guidance system
9M111-2	120 mm	13 kg	400 mm	70 m	2000 m	186 m/s	3 msl/min	semi-automatic/ wire-guided
9M111-M		12,9 kg	460 mm	75 m	2500 m	180 m/s		

- The missiles are launched from portable launching units. For guiding the missile, the task of the gunner is to keep the sight of the launching unit at the target.
- The missile included in the 9K111 system is an effective weapon for all seasons, any type of climatic and weather conditions, including the conditions of dry and wet tropical climate and mountain areas with temperature range from -50° C to +50° C
- It can be launched at dawn and in twilight, and during the night with artificial illumination of the area with the help of standard military illumination facilities.
- Two missiles in containers are placed in one bag. They are water-tight, with good floatability, and are good for river crossing.

Complete set:

9M111-2 FAGOT

- 8 launchers in a case
- Wooden packing case:
  * dimensions: 1260 x 478 x 322 mm
  * gross weight: 57 kg

9M111-M FAKTORIA

- 8 launchers in a case
- Wooden packing case:
  * dimensions: 1260 x 478 x 322 mm
  * gross weight: 57,5 kg

VAL TECHNOLOGIES

ANTITANK SYSTEM 9K113 KONKURS

9M113 KONKURS is designed for destroying visual moving and stationary armored targets, as well as other targets on the ground. The system is an effective weapon for all conditions and environments.



9K111
SEMIAUTOMATIC GUIDANCE



1 - Tripod 2 - Portable launching units 3 - Containers with missile 4 - Optical sight

VAI TECHNOLOGIES

Basic tactical and technical characteristics:

Caliber	Missile weight	Armory penetration	Minimum effective range	Maximum effective range	Average flight speed	Fire rate	Guidance system
135 mm	25,1 kg	600 mm	75 m	4000 m	208 m/s	3 rds/min	Semi-automatic/ wire-guided

- The missiles are launched from portable launching units 9m111. For guiding the missile, the task of the gunner is to keep the sight of the launching unit at the target.
- It is designed for destroying visible moving and stationary armored targets, as well as other targets on the ground.
- It can be launched at dawn and in twilight, and during the night with artificial illumination of the area with the help of standard military illumination facilities.

Complete set:

- 1 missile in a case
- Wooden packing case:
  * dimensions: 1390 x 272 x 353 mm
  * gross weight: 47,9 kg

ANTITANK SYSTEM 9K115 METIS

The missile included in the 9K115 system is an effective weapon in all seasons, in any type of climate and weather conditions, including the conditions of dry and wet tropical climate and mountain regions.

9M115 anti-tank missile





1 - Tripod
2 - Portable launching units 3 - Containers with missile 4 - Optical sight

Basic tactical and technical characteristics:

Caliber	Missile weight	Armory penetration	Minimum effective range	Maximum effective range	Average flight speed	Fire rate	Guidance system
93 mm	6 kg	460 mm	150 m	250 m	180 m/s	4 rds/min	Semi-automatic/ wire-guided

- The missiles are launched from portable launching units. For guiding the missile, the task of the gunner is to keep the sight of the launching unit at the target.
- It is designed for destroying visible moving and stationary armored targets, as well as other targets on the ground.
- It can be launched at dawn and in twilight, and during the night with artificial illumination of the area with the help of standard military illumination facilities.
- Two missiles in containers are placed in one bag. They are water-tight, with good floatability, and are good for river crossing.

Complete set:

- 8 launchers in a case
- Wooden packing case:
  * dimensions: 930 x 380 x 436 mm
  * gross weight: 45 kg

ROCKET THERMOBARIC GRENADE 107 mm FIREBALL

107 mm rocket thermobaric grenade „Fireball" is fitted with a warhead with thermobaric action. Thermobaric weapon is a type of explosive that uses oxygen from the surrounding air to generate a high-temperature explosion and blast wave with longer duration.



FIREBALL thermobaric grenade



1 - Sling
2 - Rear cover
3 - Barrel tube (container)
4 - Firing mechanism
5 - Optical sight
6 - Front cover 7
- Handle

Basic tactical and technical characteristics:

Caliber	Container length	Grenade and container weight	Direct fire range	Maximum range	Guidance system
107 mm	900 mm	14,5 kg	600 m	1800 m	launcher

- The 107 mm rocket thermobaric grenade „Fireball" is fitted with a warhead with thermobaric action and a FMP-1 fuze, which is armed upon grenade launching.
- Upon reaching the target the fuze initiates the dispersing composition which disperses the thermobaric mixture followed by the latter's detonation transformation.
- The warhead must provide an overpressure of not less than 0,2 bar (kg/cm2) at a distance of 10 m from the point of burst in open terrain.

Complete set:

- 1 launchers in a case
- Fuze FMP-1

AIRCRAFT GUN 20/3 M55

The standard towed version of the M55 is designed for infantry use. The M55 consists of three license-produced cannons (Hispano-Suiza HS.804 20 mm L/70) held in place on a single mount and a towed carriage for transportation.



Model M55A4M1 mounted on a

Basic tactical and technical characteristics:

Caliber	Lenght transport position	Weight transport/ combat	Effective range on air/ horizontal	Maximum range horizontal/ vertical	Muzzle velocity	Rate of fire (one cannon)	Elevation/ horizontal field
20 mm	4,3 m	970/1150 kg	1200/2000 m	5500/4000 m	835-880 m/s	11 rds/s	-5° do +83°/ 360°

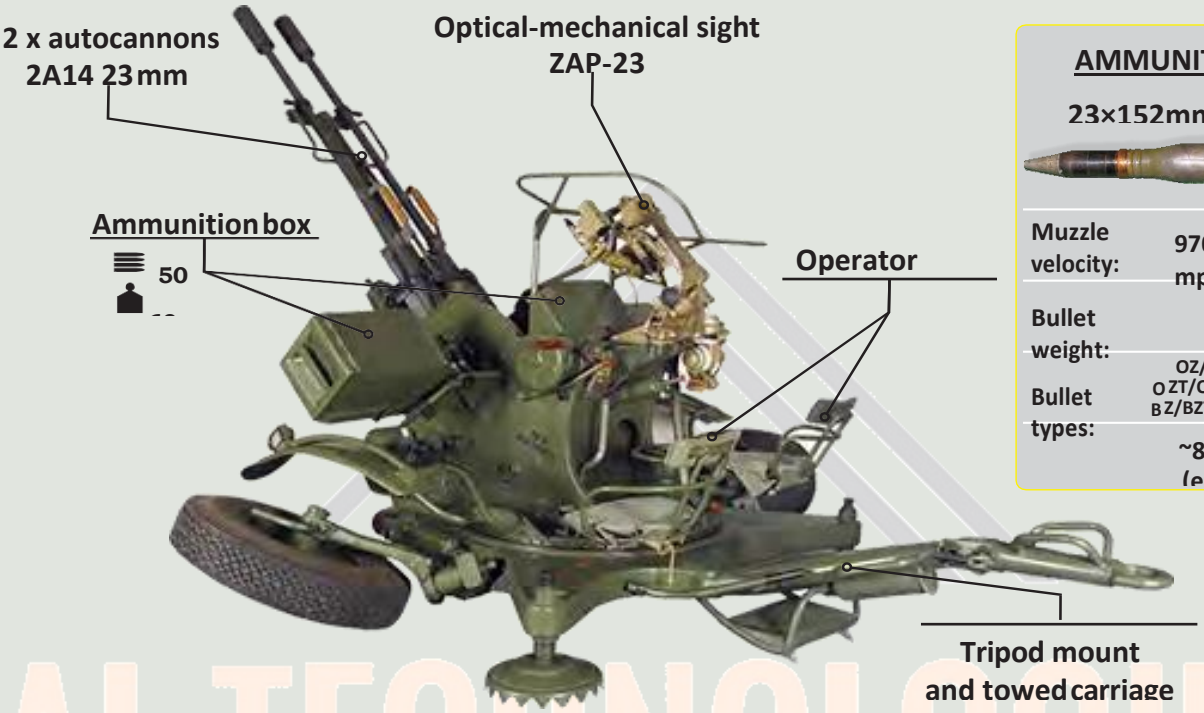
- Carriage clearance is 230-380 mm (depending on the model). Maximum speed on asphalt road is 70 km/h.
- Ammunition cal. 20x110 mm: M60 armour-piercing grenade pointer/marker, TZO M57 explosive torch cartridge and exercise grenade (M79 and M77)

M55A2B1	- Weapon control is manual with two handrails. Gunner aims with optical-mechanical sight (PANS-20/3) and opens fire with a pedal.
M55A3B1	- The hydraulic directional drive of the gun which is driven by a small gasoline engine «Wankel» to the right of the gunner's seat. Gunner uses joystick for gun control.
M55A4B1	- Engine is placed under the gunner's seat. New optical sight J-171 is installed. A splinter-proof shield is installed in front of the optical sight and the gunner,
M55A4M1	- A modified A4 B1 system upgraded with the Galileo J171 ballistic computer, mounted on a turret installed in the top roof of a BOV armoured personnel carrier.
M71/08	- This version is installed on ships. Cannons and ammunition box (mounted beneath the the cannon bottom) are positioned so that the mount and the cartridge collector protect against water.

VAL TECHNOLOGIES

AIRCRAFT GUN ZU 23/2

ZU 23/2 is designed to engage towards low-flying targets and armored vehicles. The main purpose of this weapon is direct defense of troops and strategic locations against air assault usually conducted by helicopters and low-flying airplanes.



AMMUNITION

23×152mm

Muzzle velocity:	970-980 mps
Bullet weight:	
Bullet types:	OZ/OFZ (HEI), OZT/OFZT (HEI-T), BZ/BZT (API/API-T)
	~88916,64J (estimated)

Basic tactical and technical characteristics:

Caliber	Lenght	Weight	Barrel length	Rate of fire cyclic/practical	Effective range on air/ horizontal	Elevation/ horizontal field	Number of operators
23 mm	4,57 m	950 kg	2.008 m	2000/400 rds/m	2500/2000 m	-10° do +90°/ 360°	6

- ZU 23/2 can be prepared for firing from the march position in 30 seconds and in emergency can be fired from the travelling position.
- The weapon is aimed and fired manually, with the help of the optical-mechanical sight which uses manually entered target data to provide limited automatic aiming. It also has a straight-tube telescope T-3 for use against ground targets such as infantry as well as unarmored or lightly armored vehicles.
- Normally, once each barrel has fired 100 rounds it becomes too hot and is therefore replaced with a spare barrel. Each weapon is normally provided with two replacement barrels as part of its standard equipment.

Some modifications:

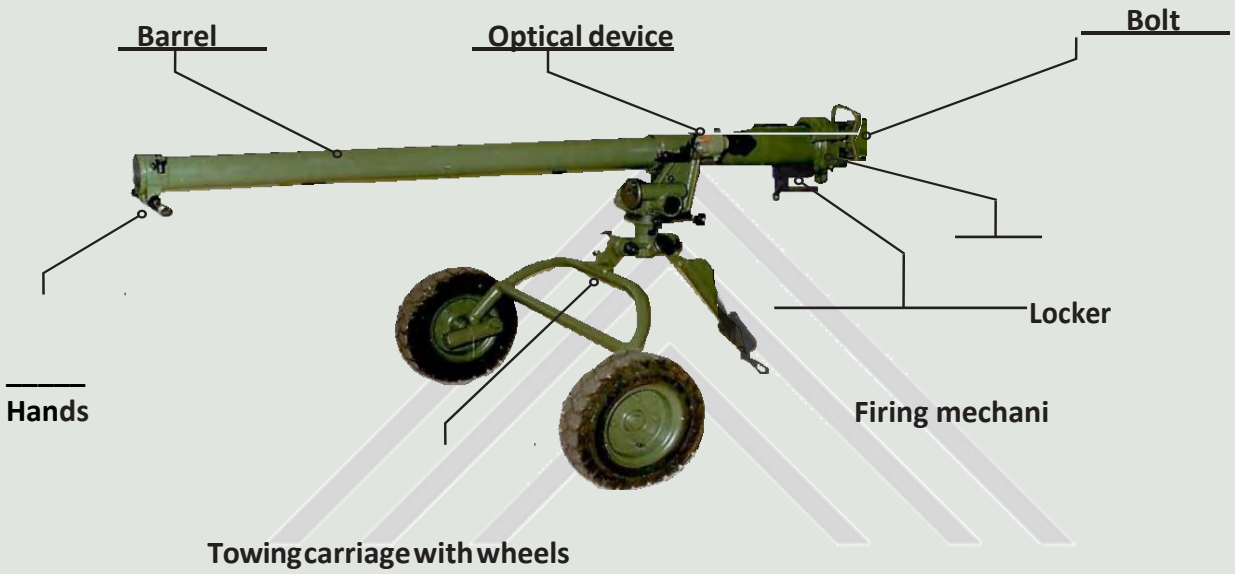

with Strela-2M SA and new sight


mounted on a truck


ZUS 23/4 mounted on armored vehicle

RECOILLESS GUN M60

Recoilless gun M60 was developed in the 1960s, primarily as an infantry anti-tank weapon. It can not break through modern armors, but is still very much present primarily because of its high precision.



Basic tactical and technical characteristics:

Caliber	Weight transport/ combat	Traverse	Elevation	Effective firing range	Maximum firing range	Optical device	Number of operators
81,8 mm	123 / 120 kg	360°	-20° do + 35°	500 m	4500 m	NS M60 or NS M74	5

- M60 ammunition types: HEAT (M60P2R - penetration 220 mm), reactive-HEAT (M72 - penetration 300 mm), reactive-HEAT (M91 - penetration 400 mm) and fragmentation warhead for anti-personnel warfare (M93).
- Direct fire is limited to 1500 meters against stationary targets and 1000 meters against moving targets.
- It has a possibility for mounting passive sighting device PN 5x80.
- Model M60A has wheels stuffed with "spongy matter" and mounted absorber on towing carriage.

Complete set:

- Recoilless gun M60
- Optical device
- Spare parts
- Tools
- Accessories
- Handling and maintenance manuals

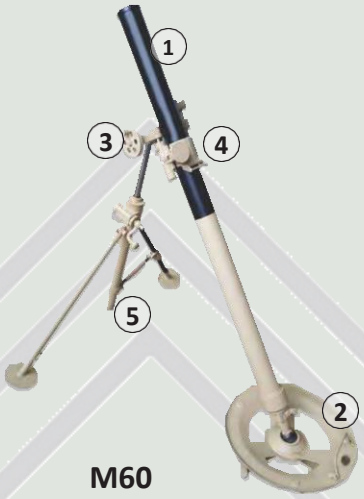
MORTAR 60mm

Mortar caliber 60 mm is designed to provide a lighter-weight alternative to company-level fire support on short ranges.

1 - Barrel **2 - Base plate** **3 - Sight bracket** **4 - Barrel collar** **5 - Bipod**



M57



M60



M60C Commando

Basic tactical and technical characteristics:

	Caliber	Lenght of barrel with breech piece	Weight in combat position	Elevation	Horizontal field of action	Maximum barrel pressure	Maximum/ minimum range	Sight device	Number of operators
M57	60,75 mm	725 mm	18,5 kg	45° - 85°	without shifting of bipod L 3° - D 3° with shifting of bipod 360°	422 bar	2537 / 74 m	NSB-3;NSB-1	3
M60		1366 mm	13,5 kg	45° - 85°		650 bar	5200 / 120 m	NSB-1	3
M60C		780 mm	9 kg	-5° - 85°		250 bar	1600 / 85 m	mehanička	2

- The basic characteristics of light mortars with 60 mm caliber: fire power, portability, short time for the transition to the combat position and high precision.
- Base plate design allows: acting from hard surfaces, shallow burial on soft soil and easy movement after the end of the fire.
- The firing pin is fixed in the base cap of the tube, and the grenade is fired automatically when it is dropped down the barrel.

Complete set:

- Barrel
- Base plate
- Bipod
- Backing frames for: barrel, bipod, base plate and ammunition boxes
- Spare parts
- Tools and accessories
- Handling and maintenance manuals
- Wooden packing case

M O R T A R 82mm

Mortar caliber 82 mm is a medium-weight mortar. It is a smooth-bore, muzzle-loading, high-angle-of-fire weapon used for long-range indirect fire support to light infantry, air assault, and airborne units across the entire front of a battalion zone of influence.

Sight device NSB-3





Basic tactical and technical characteristics:

	Caliber	Lenght of barrel with breech piece	Weight in combat position	Elevation	Horizontal field of action	Maximum barrel pressure	Maximum/ minimum range	Sight device	Number of operators
M69A	82,14 mm	1374 mm	45 kg	45° - 85°	without shifting of bipod L 3° - D 3° with shifting of bipod 360°	640 bar	6500* / 85 m	NSB-3	4
BR-2-57	81,4 mm	1324 mm				610 bar	4900 / 88 m		

* Modern ammunition developed for mortar 81mm enables action fire over 6000 m distance.

- Mortar 82 mm is transported by motor vehicles. On short distances, in combat conditions, it is transported by operators (manually or with backing frames)

Complete set:

- Barrel
- Base plate
- Bipod
- Aiming stakes
- Backing frames for: barrel, bipod, base plate and ammunition boxes
- Spare parts
- Tools and accessories
- Handling and maintenance manuals
- Wooden packing case



M O R T A R 120 mm

Mortar 120 mm is a light-weight weapon for infantry close support, designed for annihilation of manpower and destroying the firing points by short fire. It is particularly effective on intersected and hilly terrains, where the enemy may be hidden by a rear slope.

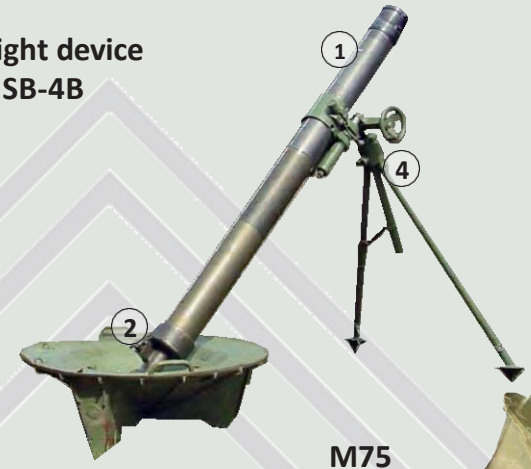
1 - Barrel 2 - Base plate 3 - Trailer 4 - Bipod with barrel collar



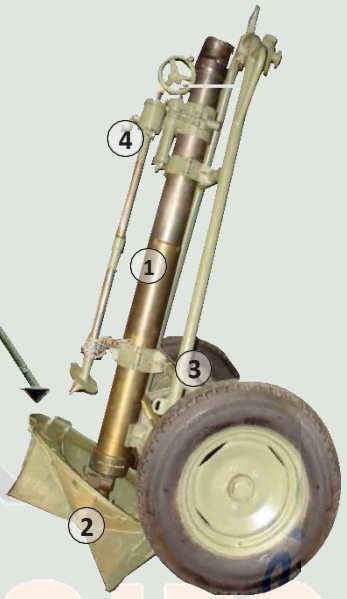
M74



Sight device NSB-4B



M75



Basic tactical and technical characteristics:

	Caliber	Lenght of barrel with breech piece	Weight in combat position	Elevation	Horizontal field of action	Maximum barrel pressure	Maximum/ minimum range	Sight device	Number of operators
M74	120 mm	1692 mm	207 / 110 kg	45° - 85°	without shifting of bipod L 3° - D 3° with shifting of bipod 360°	835 bar	6500 297 m *9400 —	NSB-4B	4+1
M75		1690 mm	261 / 168 kg						

* Modern ammunition developed for mortar 81mm enables action fire distance over 9000 m.

- Mortar 120 mm is transported by vehicles, witch increases the operators number by1 - a driver. In combat, he has a role of ammunition assistant. In combat conditions, on short distances, the mortar is transported by operators (manually or by backing frames).

Complete set:

- Barrel
- Base plate
- Bipod
- Aiming stakes
- Backing frames for: barrel, bipod, base plate and ammunition boxes
- Spare parts
- Tools and accessories
- Handling and maintenance manuals
- Wooden packing case

VAL TECHNOLOGIES

EXPLOSIVES and AMMUNITIONS

HAND GRENADE

Hand grenades are designed for defensive and offensive actions in close combat. They act through shock wave and steel balls. After activation, they can explode in water, in snow, and in mud.

1 - Body **2 - Explosive charge** **3 - Fuse** **4 - Detonator** **5 - Safety ring with pin** **6 - Lever**



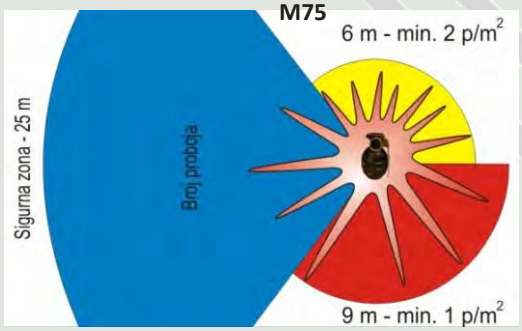
M75

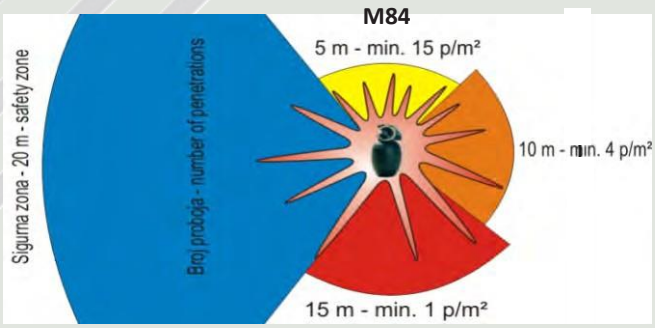


M84

Basic tactical and technical characteristics:

	Weight	Dimesions	Explosive charge	Body	Steel balls radius	Pulling force of safety element	Safety angle of declination of fuze lever	Time dalay	Use in temperature range
M75	355 g	ø 57 x 89 mm	36 g	plastic with steel balls	ø 2,5-2,9 mm	7-18 kg	min 35°	3 - 4,4 s	-30° C to +60° C
M84	480 g	ø 60 x 115 mm	95 g		ø 2 -2,3 mm	11,2 kg	min 50°	3 - 5,7 s	





Complete set:

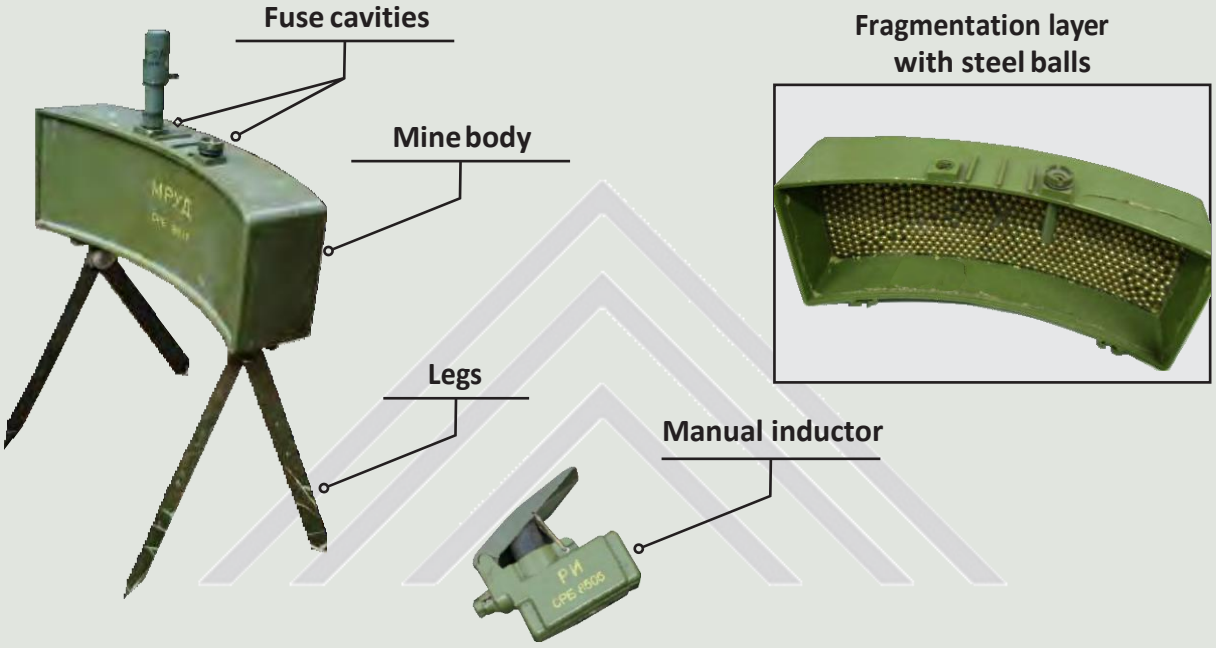
- 1 hand grenade in plastic box
- 30 plastic box in wooden packing case
- Wooden case:
  * dimensions: 130 x 380 x 630 mm
  * gross weight: 20 kg

Plastic box



ANTI-PERSONNEL MINE MRUD

MRUD (Mina Rasprskavajuća Usmerenog Dejstva) is a plastic bodied, convex rectangular directional type of anti-personnel mine designed to wound or kill by fragmentation. The body of the MRUD is waterproof and it can explode in all conditions and environments.



Basic tactical and technical characteristics:

Weight	Explosive charge	Dimension	Effect	Fragmentation layer	Field effect/ (horizontal/ vertical) Range	Use in temperature range
1,5 kg	900 g TNT	230x89x50 mm	Fragmentation	steel balls 650 pcs ø 5,5 mm	∢60° / 3° up to 50 m	od -30° C do +50° C

- The mine can be remotely detonated using a manual inductor or another electrical power source connected to electric detonator EK-40-69 with wire (up to 30 meters away).
- The fuse cavities also accept any booby trap fuse with an M10 x 1 mm:
  - UMP-1 (mechanical pull)
  - UMP-2 (mechanical pull)
  - UMNOP - multi-function fuse (mechanical pull/pressure)

* It can be detonated with other explosive charge (mine, granade etc.)

Complete set:

- 10 mines set in wooden packing case

Mine set:

- mine body
- 2 pair of legs
- manual inductor (RI)
- 2 electric detonator (EK-40-69)
- miners wire (lenght 30 m)
- controle device



ANTI-TANK MINES

TMA-4



TMRP-6



CHARACTERISTICS

Description	ANTIMAGNETIC ANTI-TANK MINE	ANTI-TANK DESTRUCTIVE PIERCING MINE
Dimensions	Ø285x110mm	Ø 290 x 132 mm
Weight	6,3 kg	7,2 kg
Explosive charge	5,5 kg Cast TNT	5,1 kg Cast TNT
Way of initiation	Through a fuze	Through a fuze
Fuze arming (time)		1 or 4 minutes
Stepping on area	Ø200 mm (314 cm²)	214 cm²
Way of fuze activation	through a fuze	through a lever / by stepping on a mine plate
Activation force (daN)	100 - 200 daN	through a lever 1,3 - 1,7 daN / by stepping 150 -350 daN
Piercing action		40 mm steel plate from the distance of 800 mm
Functions in temperature range	- 30°C to - 60°C	- 30°C to - 60°C
Airtightness (waterproof)	to 0,2 bars	to 0,2 bars
Way of setting	manually / by mine-layer	- manually - by mine-layer PMR-3b
Stability in mine field .	6 months in the most unfavorable conditions	6 months in the most unfavorable conditions
Resistance to air impact wave	to 3 bars	to 3 daN/cm²

PACKING

Way of packing	4 mines in a barel	4 mines in a wooden box
Package dimensions	Ø330x370mm (0.032 m	330x650x330mm
Gross weight	28 kg	43 kg
Storage time	20 years	15 years

AMMUNITION 9x19 mm



CHARACTERISTICS

Bullet lenght	29,69mm
Bullet weight	~12,53g
Projectile lenght	15,8 mm
Projectile weight	~0,8g
Propellant charge	~0,4g
Muzzle velocity	370±10 m/s
Accuracy Rs	max 3,8 cm at 50 m

- **Projectil material:** Jacket – Tombac CuZn10, Core – Leadantimony
- **Proppelling charge:** Smokeless, single base, flake powder

PACKING

PACKAGE 2

- 50 rounds in cardboard box
- 20 cardboard boxes (1000 rounds) in metal box M2A1
- 2 metal boxes (2000 rounds) in wire bound wooden box

AMMUNITION 5,56x45 mm

M193 (Ball)	M196 (Tracer)	M855 (Ball)	M856 (Tracer)
			

CHARACTERISTICS

	M193 (Ball)	M196 (Tracer)	M855 (Ball)	M856 (Tracer)
Bullet lenght	57,4mm	57,4mm	57,4mm	57,4mm
Bullet weight	~11,5g	~11,5g	~11,9g	~11,8g
Projectile weight	3,56g	3,5g	4g	3,92g
Projectile lenght	19,7 mm	23,2 mm	23,4 mm	28,45 mm
Propellant charge	~ 1,64g	~1,69 g	~1,6 g	~1,36 g
Muzzle velocity	965±12 m/s	950±12 m/s	920±12 m/s	917±12 m/s
Accuracy Rs	max 5,08 cm	max 12,7 cm at 183 m	max 25 cm	max 37,8 cm at 549 m
Tracer burning time		6 to 9 to max 457 m		7 to 10 to min 900 m

- **Penetration (M855/SS109)**: the bullet of the sample cartridges shall demonstrate complete penetration of 3.429 mm thickness AISI 1010 to 1020 steel plate target with hardness between min. RB55 and max. Rb70 positioned at 0° ± 5° obliquity and located 600 meters from the weapon.

PACKING

PACKAGE 1

- 20 rounds in cardboard box
- 50 cardboard boxes in metal box M2A1
- 2 metal boxes (2000 rounds) in wire bound wooden box

PACKAGE 2

- 20 rounds in cardboard box
- 10 cardboard boxes (200 rnd) in PVC bag
- 10 PVC (2000 rounds) bags in wooden case

PACKAGE 3

- 200 rounds in metal link belt (M27)
- 4 metal link belts in metal box M2A1 (800 rounds)
- 2 metal boxes wire bound wooden box (1600 rounds)

AMMUNITION 7,62x39 mm

M67 (Ball)	M78 (Tracer)	AP (Armor piecing)	API (AP incendiary)
			

CHARACTERISTICS

Bullet lenght	55,8mm	55,8mm	55,8mm	55,8mm
Bullet weight	17,4g	17,1g	17,4g	17g
Projectile weight	8 g	7,7 g	8 g	7,55 g
Projectile lenght	23,9 mm	27,8 mm	25,3 mm	26,4mm
Propellant charge	~1,67 g	~1,62 g	~1,7 g	~1,7 g
Muzzle velocity	733±8m/s	706±8m/s	733±8m/s	733±8m/s
Accuracy Rs *(PM M72)*	<15cm at 300m	<30cm at 300m	<20cm at 300m	<20cm at 300m
Tracer burning time		115 to 800m		

- **Penetration (API M82, AP)**: the bullet of the sample cartridges shall demonstrate complete penetration of 6 mm thick nickel-chromium steel plate target located 100 meters from the weapon.
- I**ncendiary (API)**: at 100 m, the incendiary composition of bullets shall ignite paper soaked in petrol located behind the armor plate.

PACKING

PACKAGE 1

- 15 rounds in cardboard box
- 10 cardboard boxes in PVC bag
- 12 PVC bags (1800 rounds) in wooden case

PACKAGE 2

- 15 rounds in cardboard box
- 54 cardboard boxes in metal box M2A1
- 2 metal boxes M2A1 in wire bound wooden box (1620 rounds)

AMMUNITION 7,62x51 mm

M80 (Ball)	M62 (Tracer)	M61 (Armor piercing)	API (Armore piercing incendiary)	APT (Armore piercing tracer)	M118 (Sniper)
					

CHARACTERISTICS

Projectile weight	9,67 g	9,46 g	9,75 g	8,75 g	9,75 g	10,9 g
Projectile lenght	29,46 mm	34,29 mm	32,2mm	32,2mm	32,2mm	31,9mm
Propellant charge	~2,85 g	~2,8 g	~2,82 g	~2,82 g	~2,82 g	~2,7 g
Muzzle velocity	828±9,1 m/s	817±9,1 m/s	838±9,1 m/s	838±9,1 m/s	917±9,1 m/s	777±9,14 m/s
Accuracy Rs	max A:12,7 B:19,1 cm at 549 m	max 38,1 cm at 549m	max 19,1 cm at 549 m	max 19,1 cm at 549 m	max 38,1 cm at 549 m	max 8,89 cm at 548 m
Tracer burning time		90 to min 777 m			92 to min 777 m	

- **Penetration (AP M61; API, APT):** The bullet of the sample cartridgees shall demonstrate complete penetration of 6 mm thick nickel-chromium steel plate target located 100 meters from the weapon..
- **Incendiary (API):** At 100 m, the incendiary composition of bullets shall ignite paper soaked in petrol located behind the armorplate.
- **Accuracy :** A* : for ammunition scheduled for packaging in cartons or clip
  B* : for ammunition scheduled for packaging in links.

PACKING

PACKAGE 1
- 20 rounds in cardboard box
- 10 cardboard boxes (200 rounds) in PVC bag
- 5 PVC bags in wooden case

PACKAGE 2
- 250 rounds in metal link belt M13 (4Ball:1Tracer)
- 1 metal link belt in metal box M19A1
- 4 metal boxes (1000 rounds) in wire bound wooden box

PACKAGE 3
- 250 rounds in metal link belt M13
- 2 metal link belts in metal box M2A1
- 2 metal boxes M2A1 (1000 rounds) in wire bound wooden box

PACKAGE 4
- 20 rounds in cardboard box
- 28 cardboard boxes (560 rounds) in metal box M2A1
- 2 metal boxes (1120 rounds) in wire bound wooden box

AMMUNITION 7,62x54R mm

M84 (Ball)	M87 (Tracer)	M90 (Armor piecing)	Sniper
			

CHARACTERISTICS

Bullet lenght	77,16 mm	77,16 mm	77,16 mm	77,16 mm
Bullet weight	~24,4 g	~23,2 g	~23,8 g	~100 pcs
Projectile weight	11 g	9,65 g	10,3 g	11,8 g
Projectile lenght	30,5 mm	36,6 mm	36 mm	32,9 mm
Muzzle velocity	785 ± 10 m/s	810 ± 10 m/s	830 ± 10 m/s	785 ± 10 m/s
Accuracy Rs	max 18 cm at 300m	max 36 cm at 300m	max 20 cm at 300m	max 12,6 cm at 300m
Tracer burning time		1000 m		

- **Penetration:** the bullet core or bullet of the cartridge shall completely perforate 10 mm of armor plate placed at 200 m from muzzle of the weapon.

- **Incendiary:** at 100 m, the incendiary composition of bullets shall ignite paper soaked in petrol located behind the armor plate.

PACKING

PACKAGE 1

- 15 rounds in cardboard box
- 28 cardboard boxes (420 rounds) in metal box M2A1
- 2 metal boxes M2A1 (840 rounds) in wire bound wooden box

PACKAGE 2

- 15 rounds in cardboard box
- 10 cardboard boxes (150 rounds) in PVC bag
- 8 PVC bags (1200 rounds) in wooden case

AMMUNITION 7,9x57 mm

	M49 (Ball)	M70 (Tracer)
		

CHARACTERISTICS

Bullet lenght	80,6mm	80,6mm
Bullet weight	~27,2g	~26,8g
Projectile lenght	34 mm	38,8mm
Projectile weight	12,85 g	12,55 g
Muzzle velocity	720±10m/s	705 ± 10 m/s
Accuracy Rs	max 9 cm at 300 m	max 15 cm at 300 m
Proppelling charge (NCD powder)	3 g	2,9 g
Tracer burning time		min 13,7-115 m max 900 m

- **Projectile material:** (M49)Jacket – Tombac, Core – Lead antimony; (M70) Jacket – Tombac, Core – Lead antimony, Tracer – Tracer compos, Foil - Tombac

PACKING

PACKAGE 1

- 15 rounds in cardboard box
- 28 cardboard boxes (420 rounds) in metal box M2A1
- 2 metal boxes M2A1 (840 rounds) in wire bound woodenbox

PACKAGE 2

- 15 rounds in cardboard box
- 10 cardboard boxes (150 rounds) in PVC bag
- 8 PVC bags (1200 rounds) in wooden case

AMMUNITION 12,7x99 mm

M33 (BAL)	M17 (TRACER)	M8 (API)	M20 (APIT)	M2 (AP)	M02 (APEI)
					

CHARACTERISTICS

Bullet lenght	138,43 mm	138,43 mm	138,43 mm	138,43 mm	138,43 mm	138,43 mm
Bullet weight	~113,99 g	~111,3g	~114,2 g	~111,4g	~113,9 g	~114,2 g
Projectile lenght	58.67mm	58,67 mm	58,67 mm	58,67 mm	58,67 mm	58,67 mm
Projectile weight	~42,31 g	~40,05 g	~42,8 g	~40,2 g	~42,5 g	~42,8 g
Propellant weight	15,1 g	14,9 g	15,1 g	14,9 g	15,1 g	15,1 g
Muzzle velocity	887±9.1 m/s	887±9.1 m/s	887±9.1 m/s	887±9.1 m/s	887±9.1 m/s	887±9.1 m/s
Accuracy Rs	max 30,48 cm at 549 m	max 30,48 cm at 549 m	max 30,48 cm at 549 m	max 30,48 cm at 549 m	max 30,48 cm at 549 m	max 30,48 cm at 549 m
Tracer burning		from 92 to 1463 m		from 92 to 1463 m		
PACKAGE	1 and 2					1, 2 and 3
WEAPON	12,7 BROWNING, machine-gun M2 HB M85 and other compatible weapons					

- **Penetration (M8, M2, M20):** The bullet core or bullet of the cartridge shall completely perforate 20 mm of armor plate placed at 100 m from the muzzle of the weapon**. Incendiary flash (M8 API):** The incendiary composition of bullets shall ignite produce an incandescent flash when fired against an Al- target at 160 m..
- **M02 APEI - Penetration:** penetrate steel plate at least 10.6 mm hardness 321–375 BRINEL, under 45° angle at 100 m. **Incendiary flash**: After fired against a target of DURAL plate 2 mm thick, under 0° angle, from 200 m distance the bullet must create an incendiary spark in distance smaller than 600 mm behind the plate. **Explosive effects :** After fired against a target of DURAL plate 2 mm thick, under 0° angle from 200 m distance the bullet must penetrate a steel plate 1.25 mm thick, placed in a distance 1,2 m behind the target with at least 10 frag..

PACKING

PACKAGE 1

- 140 rounds in metal box M2A1
- 2 metal boxes (280 rounds) in wire bound wooden box

PACKAGE 2

- 100 rounds in metal link belt M9
- 1 metal link belt in metal box M2A1
- 2 metal boxes (200 rounds) in wooden crate

PACKAGE 3

- 80 rounds in metal link belt M15A2
- 1 metal link belt in metal box M2A1
- 2 metal boxes (160 rounds) in wire bound wooden box

SPECIAL AMMUNITION 12,7x99 mm

M33 SNIPER	SOLID BALL	SOLID AP	SOLID API
			

CHARACTERISTICS

Bullet lenght	138,43 mm	138,43 mm	138,43 mm	138,43 mm
Bullet weight	100 pcs ± 2g	100 pcs ± 2g	100 pcs ± 2g	100 pcs ± 2g
Projectile weight	~ 41,82 g	~ 46 g	~ 47,1 g	~ 52,6 g
Projectile lenght	57,78 mm	59,31 mm	59,31 mm	67,03 mm
Muzzle velocity	887 ± 9,1 m/s	887 ± 9,1 m/s	887 ± 9,1 m/s	845 ± 9,1 m/s
Accuracy Rs	< 19 cm at 548,4 m (600 yards)	< 25,4 cm at 914m (1000 yards)	< 25,4 cm at 914m (1000 yards)	< 21,59 cm at 914m (1000 yards)

- **Penetration:** the bullet core or bullet of the cartridge shall completely perforate 20 mm of armor plate (hardness 302-341 HB) placed at 500 m from the muzzle of the weapon.
- I**ncendiary (API)**: at 500 m, the incendiary composition of bullets shall ignite paper soaked in petrol located behind the armor plate (80%).

PACKING

PACKAGE 1

- 140 rounds in metal box M2A1
- 2 metal boxes (280 rounds) in wire bound wooden box

PACKAGE 2

- 10 rounds in cartoon box
- 5 cartoon boxes (50 rounds) in Al folium
- 2 Al folium (100 rounds) in cartoon box

AMMUNITION 12,7x108 mm

PZZ-B32 (API)	BZT-44 (API-T)	BALL	AP	TRACER	Sniper
					

CHARACTERISTICS

Bullet lenght	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Bullet weight	~131,1 g	~126,6 g	~133,1 g	~133,1 g	~129 g	~134,1 g
Projectile lenght	64 mm	64,5 mm	64,6 mm	64,5 mm	64,5 mm	64 mm
Projectile weight	~48 g	~44 g	~48 g	~48 g	~44 g	~49 g
Propellant weight	16,5 g	16,5 g	16,5 g	16,5 g	16,5 g	17 g
Muzzle velocity	810 - 825 m/s	810 - 825 m/s	810 - 825 m/s	810 - 825 m/s	810 - 825 m/s	810 - 825 m/s
Accuracy Rs	max 20 cm at 300 m	max 20 cm at 300 m	max 20 cm at 300 m	max 20 cm at 300 m	max 20 cm at 300 m	max 15 cm at 300 m
Tracer burning		to 1000 m			to 1000 m	
WEAPON	DShK, DShKM, NSVT and other compatible weapons					

Penetration: The bullet of the sample cartridge shall demonstrate complete penetration of armour-plate (HPA-10) in sia at 100 meters from the weapon:
- bullet B-32 and AP: 20 mm
- bullet BZT-44: 15 mm

PACKING

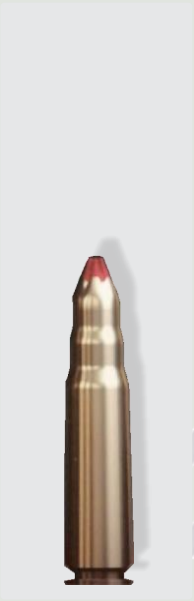
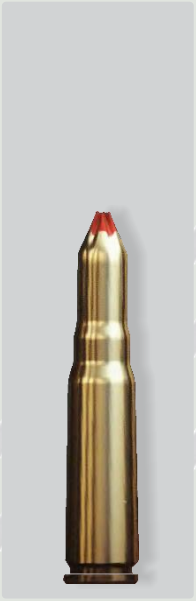
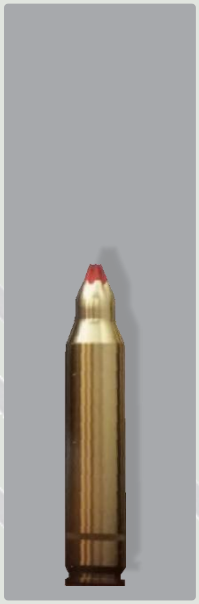
PACKAGE 1

- 104 rounds in sheet metal box
- 2 sheet metal boxes (208 rounds) in wire bound wooden box

PACKAGE 2

- 60 rounds in a DShK belt
- 1 DShK belt in a box
- 3 boxes (180 rounds) in wooden box

AMMUNITION BLANCK

7,62x39 M68	7,62x39 IC for rifle grenade	7,62x51 M82	5,56x45 M200	5,56x45 M200A1	12,7x99 M1A1
					

CHARACTERISTICS

Grenade caliber	49,3mm	55,8mm	64,50 mm	48,2mm	53,70 mm	99,46 mm
Roundweight	~9,2g	~8,55g	~11,8g	~ 6,9 g	~6,74g	~6,74g
Averagecyclicrate	~475rds/min		450-600rds/min	450-950rds/min	450-950 rds/min	400-600 rds/min
PACKAGE	package 1 package 2	package 3	package 4 package 5 package 6	package 4 package 7 package 8	package 4 package 7 package 8	package 9

PACKING

PACKAGE 1

- 15 rounds in cardboard box
- 10 cardboard boxes (150 rounds) in PVC bag
- 12 PVC bags (1800 rounds) in wooden case

PACKAGE 2

- 15 rounds in cardboard box
- 54 cardboard boxes in metal box M2A1
- 2 metal boxes M2A1 (1620 rounds) in wire bound wooden box

PACKAGE 3

- 15 rounds in cardboard box
- 10 cardboard boxes (150 rounds) in PVC foil

PACKAGE 4

- 20 rounds in cardboard box
- 10 cardboard boxes (200 rounds) in PVC bag
- 10 PVC (2000 rounds) bags in wooden case

PACKAGE 5

- 250 rounds in metal link belt M13
- 2 metal link belts in a metal box M2A1
- 2 metal boxes (1000 rounds) in wooden box

PACKAGE 6

- 250 rounds in metal link belt M13
- 1 metal link belts in a metal box M19A1
- 4 metal boxes (1000 rounds) in wooden box

PACKAGE 7

- 200 rounds in metal link belt (M27)
- 4 metal link belts in metal box M2A1
- 2 metal boxes (1600 rounds) in wooden box

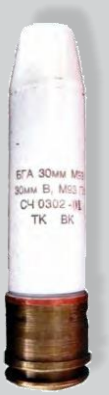
PACKAGE 8

- 20 rounds in cardboard box
- 50 cardboard boxes in metal box M2A1
- 2 metal boxes (2000 rounds) in wooden box

PACKAGE 9

- 100 rounds in metal link belt M9
- 1 metal link belt in a metal box M2A1
- 2 metal boxes (200 rounds) in wooden box

GRENADES 30 mm

	HE M93 P1	TP M93P1	PM M93 P1
			

CHARACTERISTICS

Grenade caliber	30 mm	30 mm	30 mm
Round weight	360 g	360 g	360 g
Grenade weight	273 g	273 g	273 g
Explosive weight	42 g		
Round lenght	132 mm	132 mm	132 mm
Muzzle velocity Fuze	185 m/s	185	185
arming distance Fuze	10+60 m		m/s
self-destruct time	27 s		10+60 m
Maximum range	1700 m		27 s
Lethal radius	6 m		
		-30° to 50°C	-30° to 50°C

WEAPON SYSTEM	AGL-30 mm; BGA-30 mm; AGS-17; KBA-117 or other similar weapons

PACKING

Rounds in Al-bag	48
Al-bag in wooden case	2
Dimension of case	495 x 375 x 221 mm
Case weight	44 kg

GRENADES 40 mm

	HE M03	HE M06	HEDP M04	PRACTICE M03	SMOKE M04	ILLUMINATING M04
						

CHARACTERISTICS

	HE M03	HE M06	HEDP M04	PRACTICE M03	SMOKE M04	ILLUMINATING M04
Grenade caliber	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Round weight	225 g	225 g	240 g	230 g	232 g	220 g
Explosive weight	48 g	48 g	42 g			
Round lenght	106 mm	106 mm	102 mm	106 mm	110 mm	127 mm
Muzzle velocity	78 m/s	78 m/s	78 m/s	78 m/s	76 m/s	76 m/s
Fuze arming distance	15-50 m	15-40 m	8-30 m			
Fuze self-destruct time	12-20 s	12-20 s			Delay time: 3-6 s	Delay time: 2,5-3,5 s
Fire range	400 m	400 m	400	400	50-400	182+-30 m
Lethal radius			5 m		Smoke time: 30 s	Burning time: 20 s
Penetration			60 mm			Light intensity: 80 000 cd
Operating temperature	-30° to 50°C	-30° to 50°C	-30° to 50°C	-30° to 50°C	-30° to 50°C	-30° to 50°C

WEAPON	under barrel grenade launchers 40 mm GP-25 and GP-30, BGP-40

PACKING

	HE M03	HE M06	HEDP M04	PRACTICE M03	SMOKE M04	ILLUMINATING M04
Rounds in bag	1					
Bags in wooden case	162					
Dimension of case	540x400x348 mm					
Case weight	49 kg	51 kg	51,5 kg	50 kg	50 kg	43 kg

GRENADES 40 mm for RPG-7 and RBR-7

	PG-7VL	PG-7VM PRACTICE	PG-7VM	PG-7VT	PG-7V THERMOBARIC	KO-7V	OFG-7V	OG-7V
								
CHARACTERISTICS								
Grenade launcher caliber	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Warhead caliber	93 mm	70,5 mm	70,5 mm	93 mm	70,5 mm	57 mm	50 mm	40 mm
Round weight	2,6 kg	1,975 kg	1,975 kg	3,29 kg	4,27 kg	2,97 kg	2,95 kg	1,76 kg
Precusor warhead calibre				50 mm				
Number/weight fragments						270 / 2 g	360 / 2 g	>850 / 0,9 g
Grenade weight	2,2 kg	1,6 kg	1,6 kg	2,9 kg	3,88 kg	2,58 kg	2,56 kg	1,38 kg
Propellant charge weight	0,39 kg	0,375 kg	0,375 kg	0,39 kg	0,39 kg	0,39 kg	0,39 kg	0,39 kg
Muzzle velocity	112 m/s	140 m/s	140 m/s	90 m/s	75 m/s	98 m/s	99 m/s	152 m/s
Direct fire range	250 m	300 m	300 m	200 m	220 m	250 m	250 m	170 m
Sighting range	300 m	500 m	500 m	250m	max. range 1500 m	max. range 2000 m	max. range 2000 m	max. range 1000 m
Armor penetration	500 mm		300 mm	500 mm *after ERA*		260 mm		
Safe operational temperature range	-40° to 50°C	-40° to 50°C	-40° to 50°C	-40° to 50°C	-40° to 50°C	-40° to 50°C	-40° to 50°C	-40° to 50°C
Rate of fire	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min	4 - 6 rds/min
WEAPON SYSTEM	portable anti-tank grenade launcher equipped with combined optical-mechanical sight							
PACKING								
Dimensions (mm)	899x498x294	851x432x273	851x432x273	1136x474x307	899x498x294	880x450x270	880x450x270	833x454x262
Rounds in a case	6	6	6	6	6	6	6	18
Gross weight	38 kg	32 kg	32 kg	50 kg	52kg	36 kg	36 kg	50 kg

GRENADES 73 mm

PG-9V



WEAPON SYSTEM

SPG-9V heavy anti-tank grenade launcher

OG-9VM



WEAPON SYSTEM

BSPG-9V heavy anti-tank grenade launcher

PG-15V



WEAPON SYSTEM

2A28 gun mounted on BMP-1

VAL TECHNOLOGIES

Basic tactical and technical characteristics:

	Caliber	Round weight	Grenade weight	Propellant charge weight	Muzzle velocity	Direct fire range	Sighting range	Armour penetration
PG-9V	73 mm	4,385 kg	2,615 kg	1,77 kg	435	800 m	1300 m	300 mm
OG-9VM		5,48 kg	3,68 kg	1,8 kg	m/s 316		maximum range 4500 m	fragmentation
PG-15V		3,49 kg	2,615 kg	0,875 m	m/s	800	1300 m	300 mm

- **PG-9V** and **PG-15V** anti-tank HEAT grenades designed for destroying hostile armoured vehicles, mechanized troops and manpower in field-type shelters.
- **OG-9**VM fragmentation grenade designed for destroying enemy troops in the open, in trenches, field-type shelters or brick fortifications.
- For all grenades safe operational temperature range is for -40º to 50º C. Rate of fire is 4 -6 rds/min.

Complete set:

PG-9V

- 6 rounds in a case
- Wooden packing case:
  * dimensions: 1082x520x298 mm
  * gross weight: 58 kg

OG-9VM

- 6 rounds in a case
- Wooden packing case:
  * dimensions: 1082x520x298 mm
  * gross weight: 60 kg

PG-15V

- 6 rounds in a case
- Wooden packing case:
  * dimensions: 1082x520x298 mm
  * gross weight: 51 kg

MORTAR SHELLS 60 mm

HE M73



- explosive charge is trotyl (TNT)
- explosive charge weight: 220 g
- fuse safety: 8 m (at lowest muzzle velocity)
- killing range radius: 10 m

SMOKE M73



- smoke charge weight: 190 g
- fuse safety: 8 m (at lowest muzzle velocity)

ILLUMINATING M67



- illuminating candle 200 g
- illuminating power: 180.000 Cd
- illuminating duration: 35 s
- mine parachute descent: 2,5 m/s

Basic tactical and technical characteristics:

	Caliber	Length with fuse	Weight with fuse	Fuse
HE M73	60 mm	291 mm	1,35 kg	UT M68 P1 impact fuse
Smoke M73		286 mm	1,35 kg	UT M68 P1 impact, superquick action
Illumination M67		330 mm	3,05 kg	TP M67 pyrotechnical time

Ballistic data:

60mm Mortar M57, barrel length 720mm

Maximum range (0+4)	Minimum range (0)	Maximum pressure in barrel
2550 m	94 m	414 bar
2550 m	94 m	414 bar
2450 m	400 m	414 bar

- Ignition cartridge M80 (waterproof).
- Shell is completed with ignition cartridge and 4 increment charges (0+4). Shell Illumination M67 completed with waterproof increment charges.
- High safety during transportation, handling and parachuting.
- Reliable function of shell is obtained within temperature range of -30°C to 50°C.

Complete set:

HE M73

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x400x200 mm
  * gross weight: 29 kg
  * volume: 0,042 m²

SMOKE M73

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x400x200 mm
  * gross weight: 29 kg
  * volume: 0,042 m²

ILLUMINATING M67

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x400x200 mm
  * gross weight: 27 kg
  * volume: 0,042 m²

MORTAR SHELLS 81/82 mm

HE M72/M74



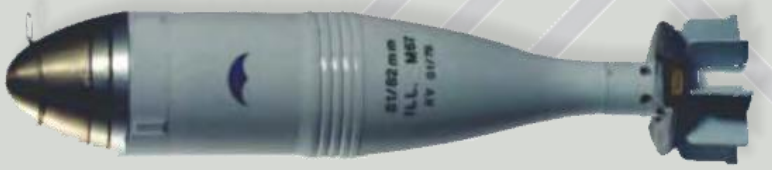
- explosive charge is trotyl (TNT)
- explosive charge weight: 680 g
- fuse safety: 8 m (at lowest muzzle velocity)
- killing range radius: 14 m

SMOKE M72/M74



- smoke charge weight: 550 g
- fuse safety: 8 m (at lowest muzzle velocity)

ILLUMINATING M67



- illuminating candle 400 g
- illuminating power: 500.000 Cd
- illuminating duration: 40 s
- mine parachute descent: 2,5 m/s

Basic tactical and technical characteristics:

	Caliber	Length with fuse	Weight with fuse	Fuse
HE M72/M74	81/82 mm	375 mm	3,05 kg	UT M68 P1 impact fuze
Smoke M72/74		375 mm	3,05 kg	UT M68 P1 impact, superquick action
Illumination M67		410 mm	2,95 kg	TP M67 pyrotechnical time

Ballistic data:

81/82mm Mortar M69 B-D, barrel length 1450mm

Maximum range (0+6) (M67 0+4)	Minimum range (0)	Maximum pressure in barrel
5070 m	91 m	647 bar
5070 m	91 m	647 bar
(0+4) 3650 m	*(0+1)* 250 m	422 bar

- Shell M72/M74 is completed with ignition cartridge and 6 increment charges (0+6). Shell Illumination M67 with ignition cartridge and 6 waterproofs increment charges (0+4)
- High safety during transportation, handling and parachuting.
- Reliable function of shell is obtained within temperature range of -30°C to 50°C

Complete set:

HE M72/M74

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x440x160 mm
  * gross weight: 29 kg
  * volume: 0,038 m²

SMOKE M72/74

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x440x160 mm
  * gross weight: 29 kg
  * volume: 0,038 m²

ILLUMINATING M67

- 1 complete shell per carton
- 12 cartons per wooden case
- Wooden packing case:
  * dimensions: 520x400x200 mm
  * gross weight: 27 kg
  * volume: 0,042 m²

MORTAR SHELLS 120 mm

HE M62P8



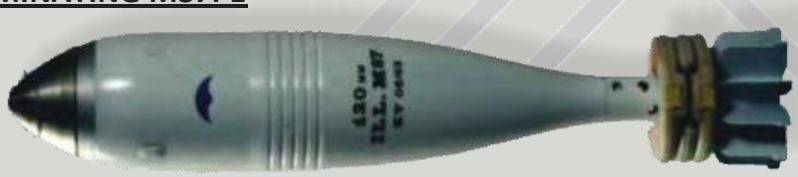
- explosive charge is hexolite (RDX/TNT) or trotyl (TNT)
- explosive charge weight: 2,45 kg
- fuse safety: 50 m (at lowest muzzle velocity)
- killing range radius: 20 m

SMOKE M64P2



- smoke charge weight: 2,45 kg
- fuse safety: 8 m (at lowest muzzle velocity)

ILLUMINATING M87P1



- illuminating candle 1,2 kg
- illuminating power: 1.000.000 Cd
- illuminating duration : 60 s
- mine parachute descent: 3 m/s

Basic tactical and technical characteristics:

	Caliber	Length with fuse	Weight with fuse	Fuse
HE M62P8	120 mm	606 mm	12,6 kg	UTU M93P1 SQ/D impact fuze
Smoke M64P2		600 mm	12,6 kg	UT M68 P1 impact, superquick action
Illumination M87P1		670 mm	10,7 kg	TP M67 pyrotechnical time

Ballistic data:

120mm Mortar M57, barrel length 1500mm

Maximum range (0+6) (M67 0+4)	Minimum range (0+1)	Maximum pressure in barrel
6500 m	255 m	961 bar
6500 m	255 m	961 bar
(0+5) 6000 m	*(0+1)* 400 m	620 bar

- Shells HE M62P8 and Smoke M64P2 are completed with ignition cartridge and 6 increment charges M74 (0+6), and shell Illumination M87P1with ignition cartridge and 5 waterproof increment charges M74 (0+5).
- High safety during transportation, handling and parachuting.
- Reliable function of shell is obtained within temperature range of -30°C to 50°C.

Complete set:

HE M62P8

- 1 complete shell per carton
- 2 cartons per wooden case
- Wooden packing case:
  * dimensions: 710x350x180 mm
  * gross weight: 38 kg
  * volume: 0,045 m²

SMOKE M64P2

- 1 complete shell per carton
- 2 cartons per wooden case
- Wooden packing case:
  * dimensions: 710x350x180 mm
  * gross weight: 38 kg
  * volume: 0,045 m²

ILLUMINATING M87P1

- 1 complete shell per carton
- 2 cartons per wooden case
- Wooden packing case:
  * dimensions: 780x350x180 mm
  * gross weight: 35 kg
  * volume: 0,049 m²

VAL TECHNOLOGIES

ARTILLERY MUNITIONS HE -FRAG

	100 mm	122 mm	130 mm	152 mm
				

CHARACTERISTICS

Type of charge	Full	Reduced	Full	Reduced	Full	Reduced	Full	Reduced
Type	HE-FRAG		HE-FRAG		HE-FRAG		HE-FRAG	
Grenade weight (fused)	30,27 kg	26,74 kg	21,76 kg		33,4 kg		43,56 kg	
Charge weight			7,83 kg	6,44 kg	25,7 kg	18,5 kg	16,36 kg	12,01 kg
Muzzle velocity	900 m/s	600 m/s	690 m/s	565 m/s	930 m/s	705 m/s	655 m/s	511 m/s
Range			15,3 km	12,5 km			17,42 km	13,4 km
Safe operational temperature range	-40° to 50°C		-40° to 50°C		-40° to 50°C		-40° to 50°C	

WEAPON SYSTEM	BS-3 field gun (M1944) D-10T, D-10S, D-10T2S tank guns, SAU-100 self-propelled gun	D-30 howitzer 2S1 self-propelled howitzer	M-46 gun	ML-20 howitzer-gun D-20 howitzer-gun 2S3 (2S3M) self-propelled howitzer.

PACKING

Dimensions case	1205 x 430 x 253 mm		1210 x 435 x 258 mm		960 x 488 x 280 mm		835 x 488 x 280 mm	
Rounds in a case	2		2		1		1	
Gross weight	87 kg	80 kg	83 kg	80 kg	86 kg	79 kg	83 kg	79 kg

ARTILLERY MUNITIONS HE / SMOKE

76 mm



105 mm



122 mm



CHARACTERISTICS

NATO designation	HE SHELL M70	SMOKE SHELL M60	HE SHELL M1A1	SMOKE SHELL M60	HE SHELL TF-462A1	HE SHELL TF-462A1
Projectile weight	6,2 kg	6,2kg	15,1 kg	15 kg	21,8 kg	
Explosive weight	0,61 kg	0,43 kg	2,15 kg	1,85 kg	3,6 kg	
Propelling charge weight	1,32 kg		1,31 kg		reduced charge 2,47 kg	full charge 3,8 kg
Cartridge case weight	1.55 kg		2,68 kg		3,66 kg	
Explosive type	TNT	WP	TNT	WP	TNT	
Projectile length	347 mm		496 mm		561 mm	
Cartridge case length	385 mm		372 mm		447 mm	
Muzzle velocity	398 m/s		491 m/s	491,472 m/s	565 m/s	690 m/s
Maximum range	8,75 km		11,62 km		12,84 km	15,3 km
Fuse type	UTIU, M68 P1		UTIU, M72 B1 UTIU, M02 UTIU, M03	UTIU, M72 B1	UTIU, M72 B1 UTIU, M02 UTIU, M03	
Fuse action	impact, superquick and delay action		impact, superquick and delay action		impact, superquick and delay action	
WEAPON SYSTEM	GUN 76 MM M48B1		SEMI FIXED HOWITZERS 105mm M56, M18/61, M2A1 AND M4		HOWITZER 122mm D30, D30J AND SP 2S1	

PACKING

Dimensions	690 x 440 x 215 mm	950 x 310 x 200 mm	980 x 500 x 230 mm
Roundsinacase	3	2	2
Gross weight / volume	39 kg / 0,06 m³	55 kg / 0,05 m³	80 kg / 0,1 m³

ARTILLERY MUNITIONS ILLUMINATING/PRACTICE

122 mm



152 mm



CHARACTERISTICS

Type of charge	Full	Reduced	Full	Reduced
Type	ILLUMINATING PRACTICE		ILLUMINATING	
Grenade weight (fused)	21,3 kg		41,95 kg	
Charge weight	7,835 kg	6,435 kg	16,36 kg	12,01 kg
Illumination intensity	>1.000.000 cd		>1.000.000 cd	
Muzzle velocity	690 m/s	565 m/s	652 m/s	509 m/s
Range	15,3 km	12,5 km	16,65 km	13,17 km
Rate of descent	7,5 - 9,5 m/s		7,5 - 9,5 m/s	
Burning time	i50 s		i50 s	
Safe operational temperature range	-40° to 50°C		-40° to 50°C	
WEAPON SYSTEM	D-30 howitzer 2S1 self-propelled howitzer		D-20 howitzer 2S3 self-propelled howitzer and its modifications	

PACKING

Dimensions	1210 x 435 x 258 mm		835 x 488 x 280 mm	
Rounds in a case	2		1	
Gross weight	83 kg	80 kg	82 kg	78 kg

ARTILLERY MUNITIONS Cal. 155 mm



WPM09



M03



BB M03



M107

CHARACTERISTICS

Projectile designation		ERFB SMOKE (WP) M09	HE ERFB M03	HE ERFB BB M03	HE M107
Projectile weight		~54,5 kg	~45,5 kg	~47,6 kg	~43,047 kg
Explosive weight		~8.7 kg (white phosphorus)	~8.7 kg (TNT)	~8.7 kg (TNT)	~6.72 kg (TNT)
Projectile length		938 mm	938mm	938mm	681mm
Propelling charge weight	zone 8	~8,5 kg	~8,5 kg		~8,5 kg
	zone 9	~12,9 kg	~12,9 kg		
	zone 10	~15,2 kg	~15,6 kg	~15,6 kg	
Muzzle velocity	zone 8	~680 m/s	~680 m/s		~690
	zone 9	~820 m/s	~820 m/s		
	zone 10	~900	~900	~925	
Maximum range	zone 8		m/s		18,4km
	zone 9	26,6 km	26,6 km		
	zone	32,2 km	32,2 km	41,1km	
Fuse type		UTIU, M02	UTIU, M02	UTIU, M02	UTIU, M02-P1
WEAPONS		STH 155 mm NORA B52 M03			

PACKING

separately packing of projectiles, propelling charges MC (zone 8, zone 9, zone 10) and fuzes	*Projectiles*	*Propelling charges MC (zone 8, zone 9, zone10)*	*Fuze*
Description	8 projectiles on a palette	charge and primer in plastic container 20 plastic containers on a palette	8 fuzes in a metal box, 80 metal boxes on a palette
Dimensions	760 x 360 x 1050 mm	1150 x 1020 x 1057 mm	1222 x 800 x 895,5 mm
Gross weight / volume	421 kg / 0,28 m³	440 kg / 1,24 m³	646 kg / 0,875 m³

MUNITIONS FOR TANK GUNS cal. 125 mm



M88



M88P1



M86P2

CHARACTERISTICS

NATO designation	APFSDS-T M88	HEAT-T M88P1	HE-FRAG M86P2
Complete cartridge weight	~20 kg	~29 kg	~33 kg
Projectile weight	~10 kg	~19 kg	~23 kg
Subcaliber bullet weight	~5,67 kg		
Base propelling charge weight	~2 kg	~10 kg	~10 kg
Explosive weight		~2 kg	~3,28 kg
Complete cartridge length	999 mm	1086 mm	1082 mm
Projectile length	591 mm	678 mm	674 mm
Muzzle velocity	~1785 m/s	~905 m/s	~850 m/s
Maximum range	4 km	4 km	12,2 km
Penetration depth	275 cm	400 cm	
Penetrator	core of tungsten carbide alloy		
Tracer burning	2 s	4 s	
Fuse type		UT-PE M87P1	UTIU M85P1
Fuse action		mechanical/piezoelectrical	PD/delay
WEAPONS	CANNONS ON TANKS T-72 AND M84		

PACKING

Dimensions	858 x 440 x 295 mm	858 x 440 x 295 mm	858 x 539 x 272 mm
Rounds in a case	1	1	1
Gross weight / volume	55 kg / 0,1 m³	55 kg / 0,1 m³	60 kg / 0,1 m³

ROCKETS FOR MULTI-TUBE LAUNCHER

GRAD M21 OF





GRAD MB21

PLAMEN-A M63





PLAMEN-C

PLAMEN-D M87



Basic tactical and technical characteristics:

	Caliber	Weight	Length	Warhead weight	Maximum range	Minimum range	Maximum velocity
GRAD M21 OF	122 mm	66,18 kg	2875 mm	19,1 kg	21 km	5 km	690 m/s
PLAMEN-A M63	128 mm	23,1 kg	837 mm	2,61 kg	8,6 km		
PLAMEN-D M87		25,5 kg	670 mm	3,3 kg	12,625 km		

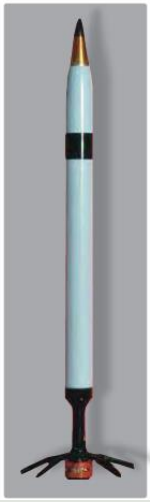
- Crew can fire the rockets from the cab or from a trigger at the end of a cable. All 40 rockets can be fire away in as little as 20 - 40 seconds, but can also be fired individually or in small groups in several-second intervals.
- "Plamen C" fires two types of missiles: PLAMEN-A M63 and PLAMEN-D M87 with extended range.
- GRAD 122 mm MB21 area of effect: against manpower - 708m², against combat equipment - 225 m²
- PLAMEN 128 mm radius of effect is 30 m.

Complete set:

GRAD M21 OF

- 1 rocket in wooden case
- Wooden packing case:
  * dimensions: 2807x280x252 mm
  * gross weight: 100 kg

AIRCRAFT ROCKET

	S-5KO	S-8KOM	BR-1-57 Fuse UTI-1	BR-2-57 Fuse UTI-2	BR-20-57P1 Fuse UTI-2	S-8 ORIGINAL	S-8 EDePro
							
Rocket caliber	57 mm	80 mm	57 mm	57 mm	57 mm	80 mm	80 mm
Type	HEAT FRAG	HEAT	FRAG	HEAT	HEAT	HEAT	HEAT
Rocket weight	4,5 kg	11,3 kg	3,9 kg	3,64 kg	4,5 kg	11,2 kg	11,2 kg
Rocket lenght	0,987 m	1,57 m	0,882 m	0,835 m	1,2 m	1,54 m	2,4 m
Warhead weight	1,36 kg	3,6 kg (0,9kg expl.)	0,815 kg (0,285 kg expl.)	1,1 kg (0,29 kg expl.)	(0,32 kg expl.)	3,6 kg (0,9 kg expl.)	3,6 kg (0,9 kg expl.)
Number/weight fragments	220 / 2 g	400 / 3 g			200		
Muzzle velocity	45 m/s	55-75 m/s	37-56 m/s	67-90 m/s	37-90 m/s		
Maximuminherentvelocity	586 m/s	600 m/s	673 m/s	563-620 m/s	563-673 m/s	600 m/s	600 m/s
Motor burning time	1,1 s	1,8 /s	0,5-0,92 /s	0,46-0,92 /s	0,46-0,92 /s	1,3 /s	1,1 /s
Burning range	300 m		250-360 m	198-289 m	198-360 m		
Armor penetration	172 mm	400 mm		100-150 mm	160-200 mm	400 mm	420 mm
Safeoperational	-60° to 50°C	-60° to 60°C	-50° to 60°C	-60° to 50°C	-60° to 50°C	-60° to 60°C	-60° to 60°C
Radiuskillingrange					18-20 m		
WEAPON SYSTEM	UB-16, UB-32 niversalauncher pods and their modifications	aircraft: B8, B8M, B8M1,B80, B8S7 helicopter: B8V20A B8V7launchers	honeycomb launchers L-57	honeycomb launchers L-57	honeycomb launchers L-57	aircraft: B8, B8M B8M1,B80, B8S7 helicopter: B8V20A, B8V7launchers	aircraft: B8, B8M, B8M1,B80, B8S7 helicopter: B8V20A, B8V7launchers
PACKING							
Dimensions(mm)	1160x368x29	1785x317x3	2				
Rounds in a case	8	4	8	8	12		
Grossweight	53 kg	68 kg			67 kg		

AIR BOMBS

Air Bomb is intended for annihilation and disabling of live force and technical devices such as: light armor combat and non-combat vehicles, artillery, rocket, radar devices and installations, landed aircraft etc.

FAB-100 M80 HE



FAB-250 M79 HE



RAB-250M91



CHARACTERISTICS

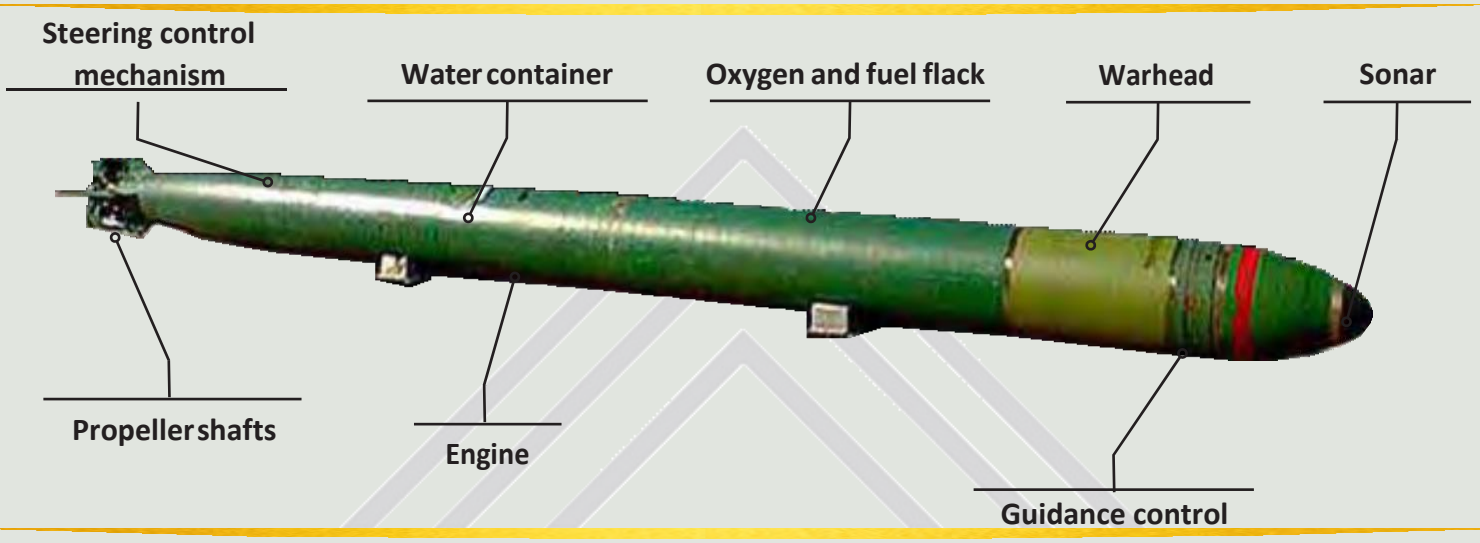
Description	free fall	with UKB-100 M80 Retarder System	free fall	with UKB-250 M80 Retarder System	free fall
Bomb weight	119,5 kg	130,5 kg	244 kg	295,5 kg	252 kg
Explosive weight	39 kg TNT		105 kg TNT		70 kg TNT
Tail unit weight					14,5 kg
Diameter of the body	230 mm		325 mm		320 mm
Bomb length	1490 mm	1617 mm	2016 mm	2200 mm	2085 mm
Max. aircraft speed	900 km/h		900 km/h		900 km/h
Min. safe distance (aircraft - detonation site)	500 m		500 m		500 m
Hook spacing	250 mm or 355,6 mm (standard NATO 14-inch)		250 mm or 355,6 mm (standard NATO 14-inch)		250 mm or 355,6 mm (standard NATO 14-inch)
Number fuze / Fuze type	2 / AUV-E or AUFK M91	2 / AUFK M91	2 / AUV-E or AUFK M91	2 / AUFK M91	1 / UPB M91
Safe operational temperature range	-40° to +50° C		-40° to +50° C		-40° to +50° C
Number of steel balls Ø12mm					

PACKING

Bombs	3 in a crate		1 inside protective rings		1 inside protective rings
Fins	12 in a crate		9 in a crate		9 in a crate
UKB		3 in wooden box		2 in wooden box	

TORPEDO 53-65 KE

Self homing torpedo, is guided to the trail of the target ship and is used for destroying ships at sea. The torpedo uses oxygen for propulsion and has great speed and range and does not leave trail when it is moving. There are two forms of the torpedo: battle and training one.



Basic tactical and technical characteristics:

	Caliber	Lenght	Weight ready for firing	Weight of explosive charge	Weight of warhead	Cylindrical continuation	
						Length	Weight with water
53-65 KE	533,4 mm	7945 mm	2070 kg	290 kg	518+/-10kg	1100 mm	273 kg
Training tor.			1930 kg				

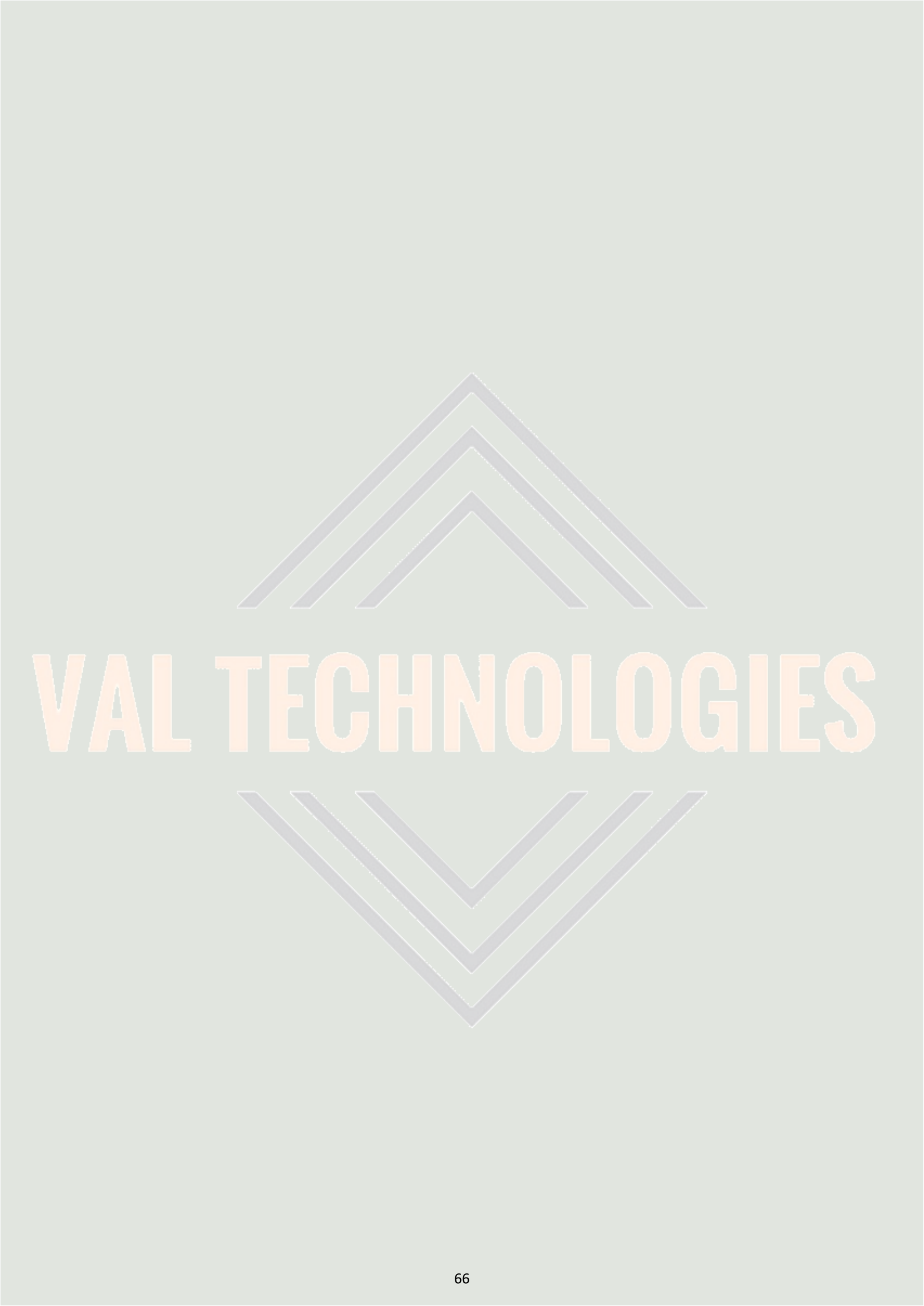
	Depth of cruising	Range of fire	Speed	Sonar system	Influence exploder	Engine caracteristics	Propeler
53-65 KE	4 - 12 m	19000 m	83 km/h	acoustic to the target ship's trail	active electromagnetic	turbine, one stage, 25 000 rpm, 430 hp	1670 rpm
Training tor.	2 - 14 m	11000 m	80 km/h				

	Oxygen		Fuel petroleum	Air		Water	
	Ammout	Pressure		Volume	Pressure	Water flack	compensation container
53-65 KE	630 l	210 kg/cm²	65 l	2 x 8,5 l	200 kg/cm²	6,7 l	11,5 l
Trening tor.	437 l		45 l	1 x 8,5 l			

- The torpedo is launched from the ships and submarines from the depth of 100 m. After launching it makes a sudden drop of 15-20 m, so it is necessary that the depth of the sea below the ship of the submarine is not less than 40m.

- The depth to which the submarine is allowed to dive with battle torpedo is 200 m and with training torpedo 120 m. The speed of the torpedo during launching is not limited.

- GAZ of the ship should not be less than 2m, if otherwise the self homing of the torpedo cannot be performed. The angle of the first crossing the trail of the ship is allowed to be in ranges 20-160


VAL TECHNOLOGIES