



**VAZOVSKI  
MASHINOSTROITELNI  
ZAVODI**

Sopot - Bulgaria



**VAZOVSKI  
MASHINOSTROITELNI  
ZAVODI  
EAD - SOPOT**



# ABOUT US

**"Vazovski Mashinostroitelni Zavodi" Sopot** was inaugurated by the Bulgarian Tsar Boris III in 1936.

**"VMZ" EAD** is the biggest state enterprise from the military and industrial complex in Bulgaria more than 83 years of history and is a leader in the production of various caliber ammunition, and in addition is the only manufacturer in the world for some of them.

Company turnover for the last two years is over 500 million euro, while profit before taxes – 180 million euro.

More than 40 million euro have been invested in the company in order to implement new technologies and innovations in the production.

VMZ-Sopot has 4200 employees, 6500 employees working for subcontractor-companies, amounting to a production personnel of 10 700 people.

Thanks to the intellectual potential of its engineering staff and high qualification of its executive personnel, high technologies have been implemented in the production, item performance characteristics are improved, and while part of the items are accepted into service in the Bulgarian army others are in the process of being accepted into service.

VMZ-Sopot's production is well-known around the world and is being exported to over 30 countries across five continents.

The company has a full license for ammunition export, import, transfer and brokerage activity, and apart from being recognized manufacturer is also a reliable commercial partner.

**"VMZ" EAD** has implemented a quality control system, certified in accordance with the requirements of the international standard ISO 9001:2008 and NATO standard AQAP 2110.

The company will go down in history as first and only enterprise to be awarded the highest national insignia of honor.



# COMPANY STRUCTURE

**"VMZ" EAD has the following designated plants and facilities:**

- **Machining plant** - specialized in the production of mechanical parts, all types of metal working, chemical coatings. Equipped with modern technological installations.

- **Assembly plant** - designated for assembly of ready products and all types of fuzes completing the manufactured ammunition. Performance of pressing, screw-extrusion of explosives, assembly and packing of ready products.

- **Open proof ground** - it is used for all types of item qualification tests, practice and demonstration firing and testing of armaments and military equipment. The proving ground is furnished with precise modern equipment to capture high-velocity processes.

- **Tooling and non-standard equipment plant** - it manufactures non-standard cutting and measuring tools as well as non-standard machines and installations.

- **Technical offices and departments** - they develop and introduce into production new items and modernize the existing ones.

**A new Innovations Department has been established composed of many young specialists.**

**The department improves old items and develops new products in order to diversify the company's production list.**

**The company's purpose is to emphasize on this department and develop at least ten innovations each year.**





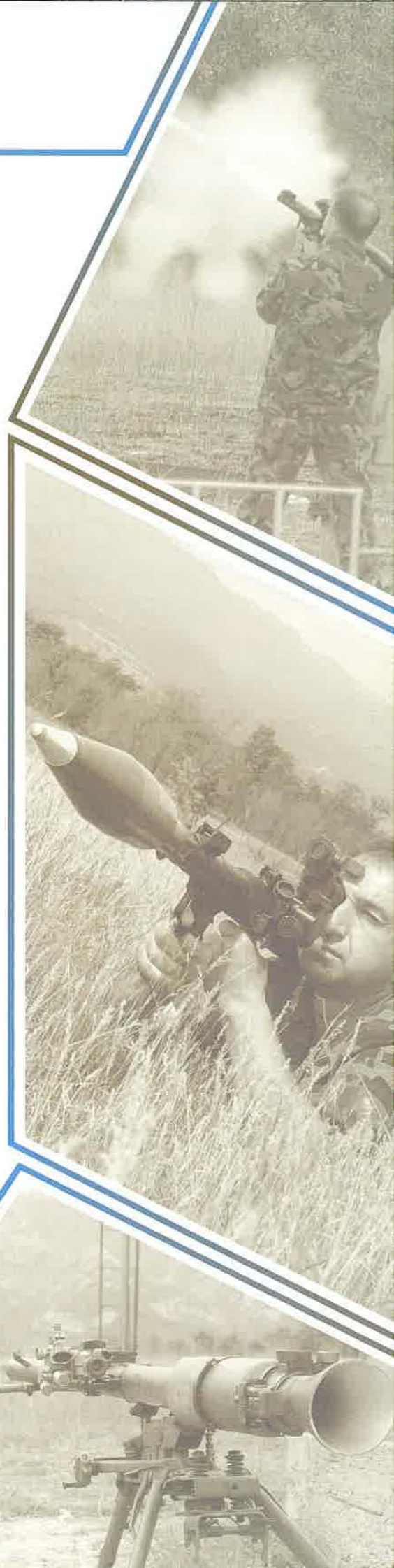
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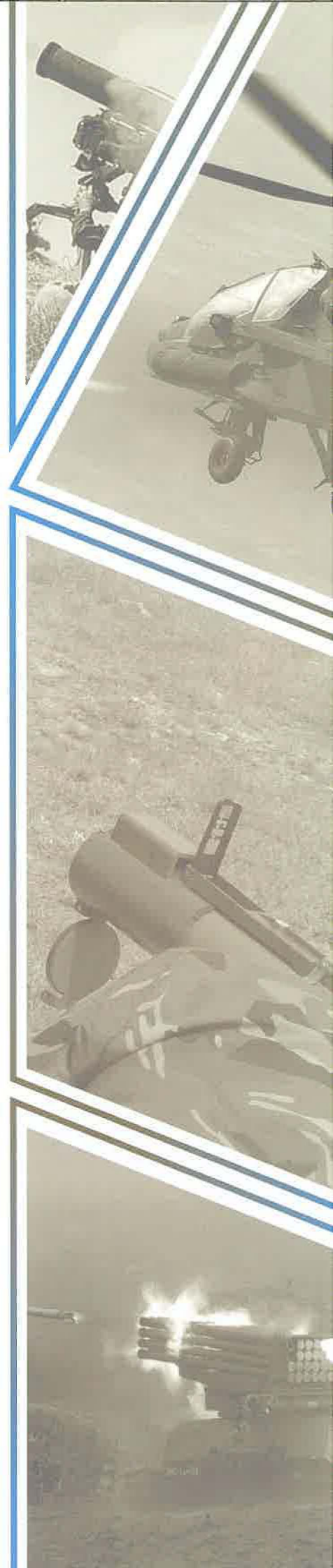
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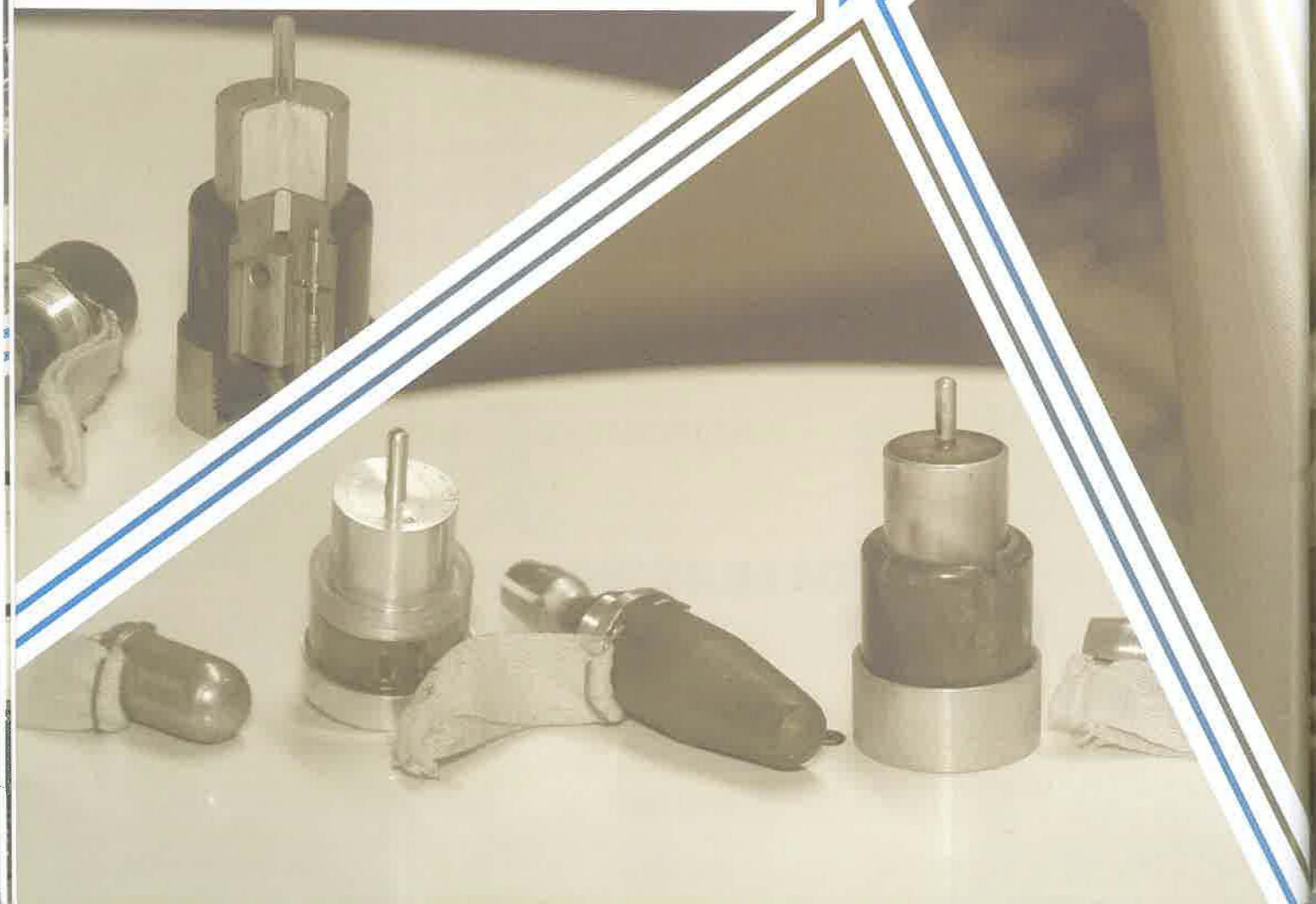
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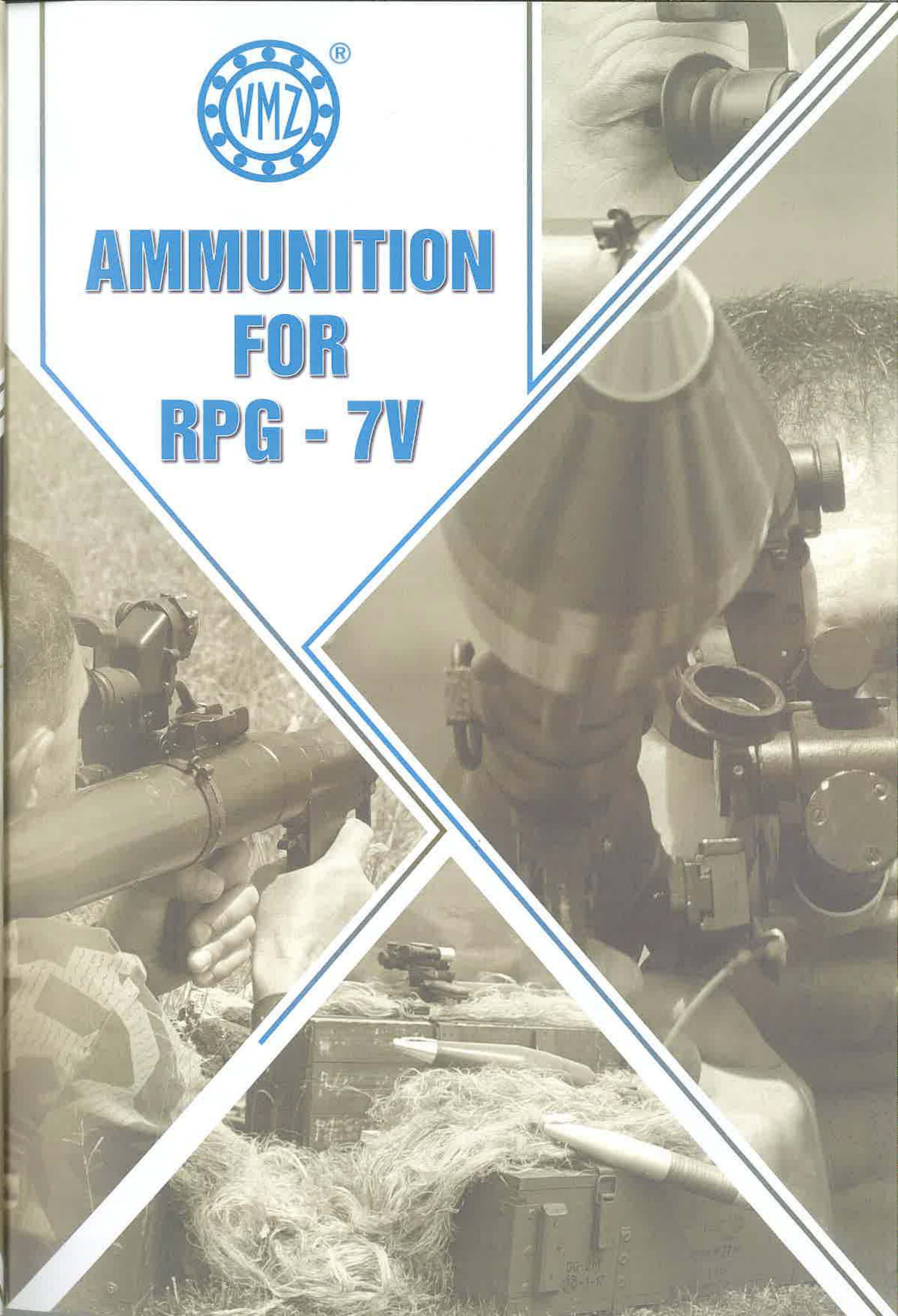
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# **AMMUNITION FOR RPG - 7V**





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## WARRIOR RPG-7 LIGHT ANTI-TANK GRENADE LAUNCHER

## WARRIOR RPG-7

The 40 mm WARRIOR RPG-7 is a mighty , reliable recoilless weapon - man-portable, shoulder-fired, antitank rocket-propelled grenade launcher, designed to defeat tanks, self-propelled artillery units and other armored vehicles, as well as manpower in open and in armored shelters (range with different rounds and sights from 50 to 3000m).

### TECHICAL DATA

Caliber, mm	40
Dimensions (Length), mm	950
Weight (unloaded) with sighting device, kg	6.45
Angle of elevation (degrees):	up to 30 for PGDN-7VIR only
Operation system:	Recoilless
Firing rate, rounds/minute	4-6
System life, rounds	500
Portable combat set, rounds	5

### AMMUNITIONS

Works with all types of anti-tank, fragmentation, thermobaric and tandem type 40mm rounds for this type of grenade-launcher

### SIGHTS

**Optical Sight PRGO-7V3** or (up to 500m)

**Optical Sight PGO-7W4** (Via mechanical drum scale this is the only one sight that allows aimed shooting with in distance up to 3000m) or

**Digital Day/Night Sight PGDN-7VIR** (field observation and aiming at both day and night) or

**Thermal vision sight PGDN-7TV** (field observation and aiming at both day and night)

### PACKING

**Wooden case with 9 weapons incl. sights**

Dimensions, mm 1240x640x435

1 wooden case incl. 9 weapon and sights

Gross weight of case incl. 9 weapons and sights, kg 100

**Wooden case with 9 individual SPTA SET, 1 SPTA per 9 pcs RPG-7**

Dimensions, mm 1240x650x440

Gross weight of case incl. SPTA SET, kg 49

Optionally, the grenade launcher can be equipped with:  
collapsible bipod / attachment rail "Picatinny" type  
upon request.







## PG-7VM ROUND WITH PG-7M ANTI-TANK GRENADE

NSN: 1310-50-0001571



It is designed for use against hostile armoured vehicles, mechanized troops and manpower in field-type and urban-type shelters.

### CHARACTERISTICS

Grenade caliber, mm	40
Warhead caliber, mm	70,5
Round weight, kg	1,975
Grenade weight, kg	1,600
Propellant charge weight, kg	0,375
Muzzle velocity, m/s	140
Direct fire range, m	300
Sighting range, m	500
Armor penetration, mm	300
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	851x432x273
6 rounds in a case	
Gross weight, kg	28





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## PG-7VM HOLLOW-CHARGE PRACTICE ROUND

NSN: 1310-50-0003366



PG-7VM practice round with hollow-charge is live round with practice warhead and is used for training of personnel and live fire against targets where it leaves traces of impact.

The practice round possesses the same dimensions, weight and ballistic characteristics as a live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the probability of starting a fire and increases the safety while conducting demonstrative and training firing.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	70,5
Weight of round, kg	1,975
Weight of grenade, kg	1,600
Weight of propellant charge, kg	0,375
Muzzle velocity, m/s	140
Direct fire range, m	300
Sighting range, m	500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher fitted with combined optical-mechanical sight

### PACKING

Dimensions, mm	851x432x273
6 rounds in a case	
Gross weight, kg	28







## PG-7VMI ROUND WITH PG-7M ANTI-TANK GRENADE WITH INERT WARHEAD

NSN: 1310-50-0003366



PG-7VMI round is designed for conducting firing practice.

The rounds with grenades with inert warheads are supposed to provide the possibility of observing the target defeat, while retaining the same overall dimensions, weight, ballistic characteristics, service and handling as these of the live rounds.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	70,5
Weight of round, kg	1,975
Weight of grenade, kg	1,600
Weight of propellant charge, kg	0,375
Muzzle velocity, m/s	140
Direct fire range, m	300
Sighting range, m	500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
fitted with combined optical-mechanical sight

### PACKING

Dimensions, mm	851x432x273
6 rounds in a case	
Gross weight, kg	28





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## PG-7VN ROUND WITH PG-7N ANTI-TANK GRENADE

NSN: 1310-50-0001566



It is designed for use against hostile armoured vehicles, mechanized troops and manpower in field-type and urban-type shelters.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	72,3
Round weight, kg	1,945
Grenade weight, kg	1,570
Propellant charge weight, kg	0,375
Muzzle velocity, m/s	140
Direct fire range, m	300
Sighting range, m	500
Armor penetration, mm	400
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	851x432x273
6 rounds in a case	
Gross weight, kg	28







## PG-7VL ROUND WITH PG-7L ANTI-TANK GRENADE

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NSN: 1310-50-0001564



It is designed for use against hostile armoured vehicles, mechanized troops and manpower in field-type and urban-type shelters.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	93
Round weight, kg	2,600
Grenade weight, kg	2,200
Propellant charge weight, kg	0,390
Muzzle velocity, m/s	112
Direct fire range, m	250
Sighting range, m	300
Armor penetration, mm	500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	899x498x294
6 rounds in a case	
Gross weight, kg	38





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**PG-7VLM ROUND  
WITH PG-7LM  
ANTI-TANK GRENADE**

**NSN : 1310-50-001-5862**



It is designed for use against hostile armoured vehicles, mechanized troops and manpower in field-type and urban-type shelters.

**CHARACTERISTICS**

Grenade launcher caliber, mm	40
Warhead caliber, mm	93
Round weight, kg	2,600
Grenade weight, kg	2,200
Propellant charge weight, kg	0,390
Muzzle velocity, m/s	112
Direct fire range, m	250
Sighting range, m	300
Armor penetration, mm	600
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

**PACKING**

Dimensions, mm	950x498x294
6 rounds in a case	
Gross weight, kg	38







## PG-7VT ROUND WITH PG-7T ANTI-TANK GRENADE

NSN: 1310-50-0012001



It is designed for use against hostile armoured vehicles (including ERA-equipped), mechanized troops and manpower in field-type and urban-type shelters.

### CHARACTERISTICS

Grenade launcher calibre, mm	40
Main warhead calibre, mm	93
Precursor warhead calibre, mm	50
Round weight, kg	3,240
Grenade weight, kg	2,840
Propellant charge weight, kg	0,390
Muzzle velocity, m/s	90
Direct fire range, m	200
Sighting range, m	250
Armor penetration after ERA, mm	500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	1136x474x307
6 rounds in a case	
Gross weight, kg	50





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## **OG-7V ROUND WITH 40 mm OG-7 FRAGMENTATION GRENADE**

**NSN: 1310-50-0001557**

It is designed for use against enemy personnel in the open, in trenches, light field-type shelters as well as against hostile light armoured or unarmoured vehicles.



### **CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	40
Round weight, kg	1,750
Grenade weight, kg	1,375
Propellant charge weight, kg	0,375
Number of fragments 0,9 g in average weight	≥850
Muzzle velocity, m/s	152
Direct fire range, m	170
Maximum range, m	1000
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### **WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical or mechanical sight

### **PACKING**

Dimensions, mm	698x368x278
24 rounds in case	
Gross weight, kg	59







## OG-7VE ROUND WITH OG-7E FRAGMENTATION GRENADE

NSN: 1310-50-0001558

It is designed for use against enemy personnel in the open, in trenches, field-type shelters and urban constructions, light armoured and unarmoured vehicles.



### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	85
Round weight, kg	4,390
Grenade weight, kg	4,000
Propellant charge weight, kg	0,390
Number of fragments 1g in weight	1200
Muzzle velocity, m/s	70
Maximum range, m	1000
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	800x495x312
6 rounds in a case	
Gross weight, kg	50

### Static test :

Metal sheet with dimensions

Width 700 mm

Height 1200 mm

The metal sheet is placed at 5-7 m radius from the exact point of the burst of warhead

Approximate number of fragments, pcs. 98





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**OG-7VM ROUND  
WITH 40 mm OG-7  
FRAGMENTATION GRENADE**

**NSN: 1310-50-0001559**

It is designed for use against enemy personnel in the open, in trenches and light field-type shelters, as well as against hostile light armoured or unarmoured vehicles.



**CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	40
Round weight, kg	1,750
Grenade weight, kg	1,375
Propellant charge weight, kg	0,380
Number of fragments over 0,9 g in average weight	>850
Muzzle velocity, m/s	145
Direct fire range, m	170
Maximum range, m	1000
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical or mechanical sight

**PACKING**

Dimensions, mm	698x368x278
24 rounds in case	
Gross weight, kg	59







## OG-7VMZ ROUND WITH 40 mm OG-7MZ FRAGMENTATION GRENADE

NSN: 1310-50-0001560

It is designed for use against enemy personnel in the open, in trenches and light field-type shelters, as well as against hostile light armoured or unarmoured vehicles.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	42
Round weight, kg	1,755
Grenade weight, kg	1,380
Propellant charge weight, kg	0,375
Number of fragments over 0,25 g in weight	>1200
Muzzle velocity, m/s	152
Direct fire range, m	165
Maximum range, m	1000
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical or mechanical sight

### PACKING

Dimensions, mm	900x478x267
18 rounds in a case	
Gross weight, kg	54





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## OFG-7V ROUND WITH OFG-7 HE-FRAGMENTATION GRENADE

NSN: 1310-50-0001561



It is intended for use against enemy personnel in the open, in trenches, light field-type shelters as well as against hostile light armoured or unarmoured vehicles. The grenade is equipped with a warhead containing semiready fragments.

### CHARACTERISTICS

Grenade launcher calibre, mm	40
Warhead calibre, mm	57
Round weight, kg	2,950
Grenade weight, kg	2,560
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	360
Muzzle velocity, m/s	99
Maximum range, m	2000
Direct fire range, m	250
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

### PACKING

Dimensions, mm	880x450x270
6 rounds in a case	
Gross weight, kg	36







## **OFG-7VM ROUND WITH OFG-7M HE-FRAGMENTATION GRENADE**



It is intended for use against enemy personnel in the open, in trenches, light field-type shelters as well as against hostile light armoured or unarmoured vehicles. The grenade is equipped with a warhead containing semiready fragments.

### **CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	57
Round weight, kg	3,408
Grenade weight, kg	3,018
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	360
Muzzle velocity, m/s	85
Maximum range, m	2800
Direct fire range, m	450
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### **WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

### **PACKING**

Dimensions, mm	1023x478x318
6 rounds in a case	
Gross weight, kg	39



**- 14 -****OFG-7V ROUND  
WITH OFG-7  
HE-FRAGMENTATION GRENADE****NSN: 1310-50-0001561**

It is intended for use against enemy personnel in the open, in trenches, light field-type shelters as well as against hostile light armoured or unarmoured vehicles. The grenade is equipped with a warhead containing semiready fragments.

**CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	57
Round weight, kg	2,950
Grenade weight, kg	2,560
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	360
Muzzle velocity, m/s	99
Maximum range, m	2000
Direct fire range, m	250
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

**PACKING**

Dimensions, mm	880x450x270
6 rounds in a case	
Gross weight, kg	36







## **OFG-7VM ROUND WITH OFG-7M HE-FRAGMENTATION GRENADE**



It is intended for use against enemy personnel in the open, in trenches, light field-type shelters as well as against hostile light armoured or unarmoured vehicles. The grenade is equipped with a warhead containing semiready fragments.

### **CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	57
Round weight, kg	3,408
Grenade weight, kg	3,018
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	360
Muzzle velocity, m/s	85
Maximum range, m	2800
Direct fire range, m	450
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### **WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

### **PACKING**

Dimensions, mm	1023x478x318
6 rounds in a case	
Gross weight, kg	39





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## OG-7VLR ROUND WITH OG-7LR FRAGMENTATION GRENADE

NSN : 1310-50-001-6043

This round is designed for destroying enemy troops in the open, in trenches, field-type shelters, stone, brick or concrete structures, light armoured and unarmoured vehicles.

### CHARACTERISTICS

Grenade launcher calibre, mm	40
Warhead calibre, mm	50
Round weight, kg	3,490
Grenade weight, kg	3,110
Propellant charge weight, g	0,380
Number of fragments/ weight, g	1800/0,39
Muzzle velocity, m/s	86
Maximum range, m	3100
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

### PACKING

Dimensions, mm	1000x450x270
6 rounds in a case	
Gross weight, kg	42

### Static test :

Aluminum sheet with dimensions  
Width 1000 mm  
Height 2000 mm  
Thickness 3 mm

The aluminum sheet is placed at 5 m radius  
from the exact point of the burst of warhead  
Approximate number of fragments, over 60 pcs.







## KO-7V ROUND WITH KO-7 HOLLOW-CHARGE FRAGMENTATION GRENADE

NSN: 1310-50-0001562



It is intended for destroying tanks, self-propelled guns and other armour-protected fire power and mechanized troops, for defeating enemy troops in the open, in trenches, light field-type shelters and urban-type brick fortifications. The grenade warhead is a combination of a hollow-charge fragmentation bursting charge and semiready fragments.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	57
Round weight, kg	2,970
Grenade weight, kg	2,580
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	270
Muzzle velocity, m/s	98
Direct fire range, m	200
Maximum range, m	2000
Armour penetration of steel homogeneous armour, mm	260
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	880x450x270
6 rounds in a case	
Gross weight, kg	36





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## KO-7VM ROUND WITH KO-7M HOLLOW-CHARGE FRAGMENTATION GRENADE

NSN : 1310-50-001-5857



It is intended for destroying tanks, self-propelled guns and other armour-protected fire power and mechanized troops, for defeating enemy troops in the open, in trenches, light field-type shelters and urban-type brick fortifications. The grenade warhead is a combination of a hollow-charge fragmentation bursting charge and semiready fragments.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	57
Round weight, kg	3,570
Grenade weight, kg	3,180
Propellant charge weight, kg	0,390
Number of fragments 2 g in weight	270
Muzzle velocity, m/s	85
Maximum range, m	2900
Direct fire range, m	450
Armour penetration of steel homogeneous armour, mm	260
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	1023x478x318
6 rounds in a case	
Gross weight, kg	43







## WB-7V ROUND WITH WB-7V WALL PENETRATION GRENADE

- 19 -

NSN : 1310-50-001-5851



The WB-7V round is intended for destroying concealed hostile emplacements (trenches, fortified buildings, stone, brick or concrete shelters).

- The warhead of this round ensures the penetration of the shelters through the percussion action and defeating the manpower through the blast wave.

### CHARACTERISTICS

Grenade launcher caliber, mm	40
Warhead caliber, mm	93
Round weight, kg	3,620...3,740
Grenade weight, kg	3,230...3,350
Propellant charge weight, kg	0,390
Average muzzle velocity at a temperature of the WB-7P propellant charge of +15C, m/s	85
Direct fire range at a target height of 2.5 m, m	250
Wall penetration of brick wall, mm	400
Safe operational temperature range, °C	-40....50

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher equipped with combined optical-mechanical sight

### PACKING

Dimensions, mm	899x498x294
6 rounds in a case	
Gross weight, kg	45



Penetration:  
Width 540 mm  
Height 780 mm



**- 20 -****TB-7V ROUND  
WITH TB-7  
THERMOBARIC GRENADE****NSN: 1310-50-001-4779**

This round is designed for destroying enemy troops in the open, in trenches, field-type shelters, stone, brick or concrete structures, light armoured and unarmoured vehicles.

**CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	93
Round weight, kg	4,440
Grenade weight, kg	4,050
Propellant charge weight, kg	0,390
PTBS weight, kg	2.365
Muzzle velocity, m/s	67
Effective range, m	1200
Maximum range, m	1500
Direct fire range, m	165
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher with combined optical-mechanical sight

**PACKING**

Dimensions, mm	1015x498x294
6 rounds in a case	
Gross weight, kg	52







## TB-7VM ROUND WITH TB-7M THERMOBARIC GRENADE

- 21 -

NSN : 1310-50-001-5849



This round is designed for destroying enemy troops in the open, in trenches, field-type shelters, stone, brick or concrete structures, light armoured and unarmoured vehicles.

### CHARACTERISTICS

Grenade launcher calibre, mm	40
Warhead calibre, mm	72,5
Round weight, kg	3,09
Grenade weight, kg	2,70
Propellant charge weight, kg	0,390
PTBS weight, kg	0.705
Muzzle velocity, m/s	96
Effective range, m	800
Maximum range, m	2700
Direct fire range, m	470
Safe operational temperature range, °C	-40....60
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

RPG-7V portable anti-tank grenade launcher  
with combined optical-mechanical sight

### PACKING

Dimensions, mm	847x438x254
6 rounds in a case	
Gross weight, kg	39





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**TB-7VM1 ROUND  
WITH TB-7M  
THERMOBARIC GRENADE**

**NSN : 1310-50-001-5850**



This round is designed for destroying enemy troops in the open, in trenches, field-type shelters, stone, brick or concrete structures, light armoured and unarmoured vehicles.

**CHARACTERISTICS**

Grenade launcher calibre, mm	40
Warhead calibre, mm	72,5
Round weight, kg	2,68
Grenade weight, fuze, kg	2,29
Propellant charge weight, kg	0,390
PTBS weight, kg	0.705
Muzzle velocity, m/s	98
Direct fire range, m	350
Effective range, m	600
Maximum range, m	2000
Safe operational temperature range, °C	-40...60
Rate of fire, rds./min	4...6

**WEAPON SYSTEM**

RPG-7V portable anti-tank grenade launcher with combined optical-mechanical sight

**PACKING**

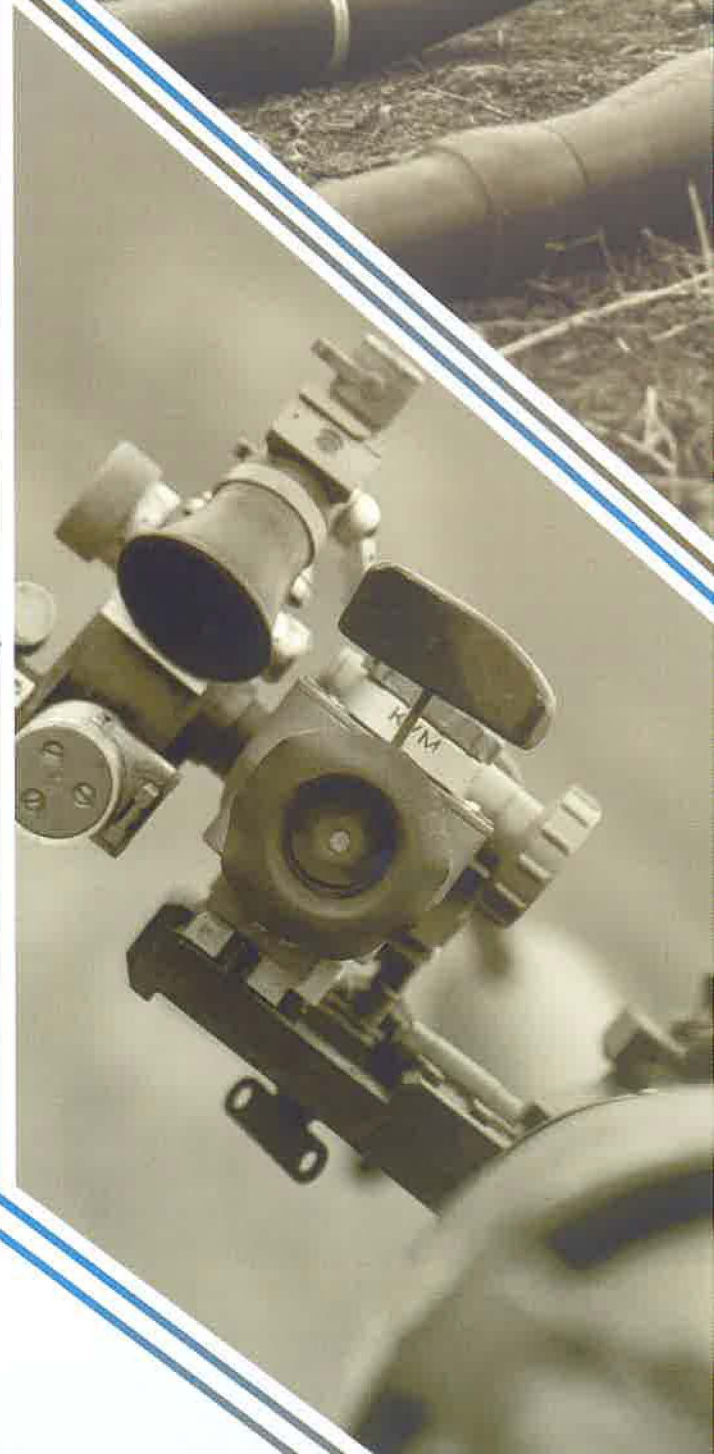
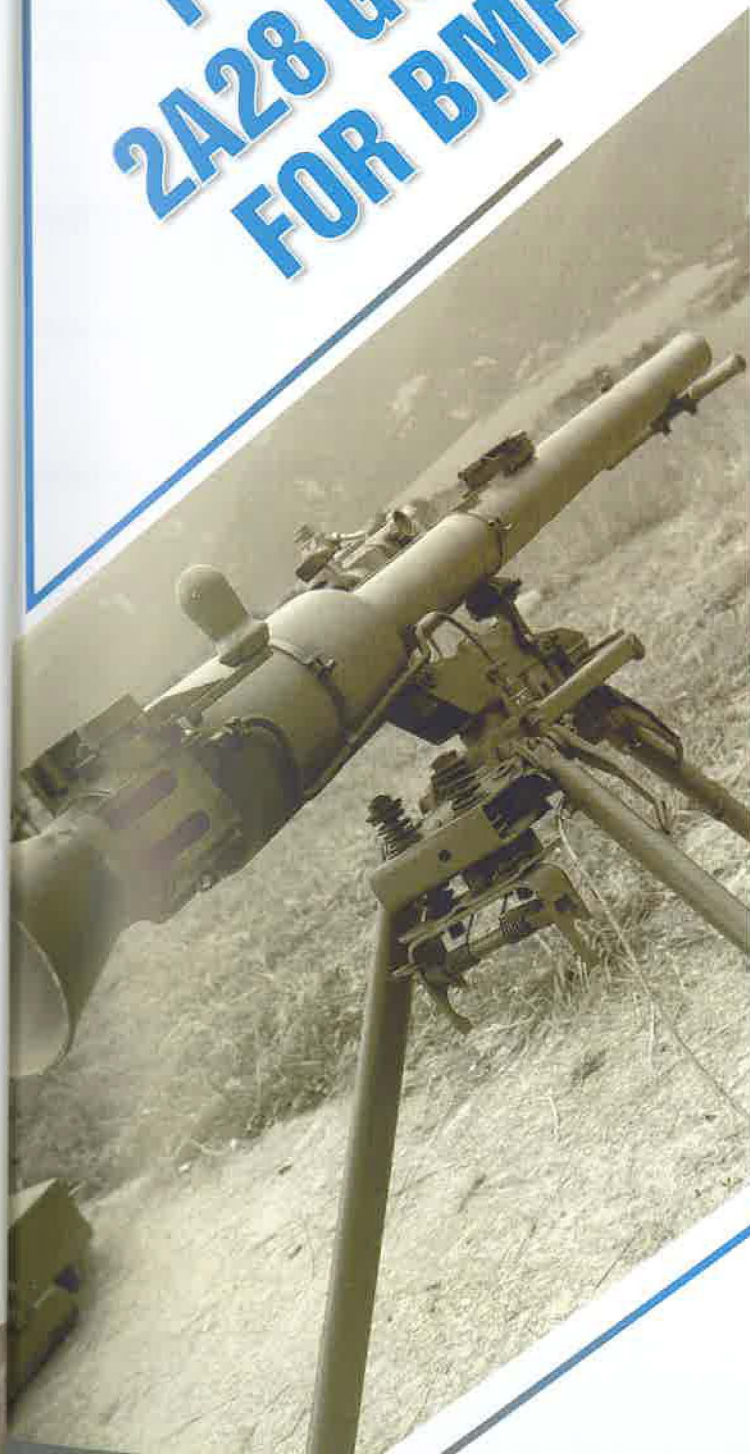
Overall dimensions, mm	847x438x254
6 rounds in a case	
Gross weight, kg	39







# AMMUNITION FOR SPG - 9 2A28 GUN FOR BMP - 1







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## **WARRIOR SPG-9 ANTI-TANK GRENADE LAUNCHER**

## **WARRIOR SPG-9**



SPG-9 is primarily an anti-armour weapon firing a 73 mm high-explosive anti-tank warhead to ranges exceeding 1,300 m.

The weapon can also fire high-explosive fragmentation ammunition for use against personnel (to indirect ranges approaching 4,600-4,800 m).

### **TECHICAL DATA**

Caliber, mm

Dimensions (L/W/H), mm

2360/1100/400

Weight (unloaded) without tripod, kg

Weight (unloaded) with tripod, peep-sight:

Operation system:

Recoilless, rear vent

Muzzle velocity, m/s

### **AMMUNITIONS**

Works with all types of anti-tank and fragmentation type 73mm rounds for this type of grenade-launcher

### **SIGHTS**

**Optical Sight MGOK-9** (analog of PGOK-9)

or

**Digital Day/Night Sight PGDN-9VIR**

- Digital sight with long life rechargeable inside battery

- Additional external battery with cable and connector to sight, standard C90 connector for universal charging from 10..30 Vdc and fire power (USB option for charging (5 Vdc))

- ND filter and Protective window with anti-reflection coating;

- C90 connector with cable and pins for battery charging from 10..30 V

- Rugged IP67 transport case.

or

**Thermal vision sight PGDN-9TV**

### **PACKING**

Dimensions, mm

2445x425x400

1 wooden case incl. 1 weapon, 1 sight and accessories

Weight of wooden case, kg

Gross weight, kg







**PG-9V ROUND  
WITH PG-9  
ANTI-TANK GRENADE**

**NSN: 1310-50-0001555**



It is designed for destroying hostile armoured vehicles, mechanized troops and manpower in field-type shelters.

**CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	3,970
Grenade weight, kg	2,520
Propellant charge weight, kg	1,770
Muzzle velocity, m/s	435
Direct fire range, m	800
Sighting range, m	1300
Armour penetration, mm	300
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

SPG-9M heavy anti-tank grenade launcher

**PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	58





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**PG-9VN ROUND  
WITH PG-9N  
ANTI-TANK GRENADE**

**NSN: 1310-50-0001556**



It is designed for destroying hostile armoured vehicles, mechanized troops and manpower in field-type shelters.

**CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	4,400
Grenade weight, kg	2,630
Propellant charge weight, kg	1,770
Muzzle velocity, m/s	435
Direct fire range, m	800
Sighting range, m	1300
Armour penetration, mm	400
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

SPG-9M heavy anti-tank grenade launcher

**PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	60





**TATR-9VMZ ROUND  
WITH TATG-9VMZ  
ANTI-TANK GRENADE****NSN : 1310-50-001-5842**

Intended for destroying tanks, self-propelled guns and other armoured vehicles (including ERA-equipped). It can also be used for suppressing enemy personnel in brick or reinforced concrete buildings and fortifications, or log-and-earth shelters.

**CHARACTERISTICS**

Main hollow-charge warhead caliber, mm	73
Round weight, kg	4,92
Grenade weight, kg	3,15
Propellant charge weight, kg	1,77
Muzzle velocity, m/s	435
Direct fire range, m	600
Sighting (Aiming) range, m	800
Maximum range, m	1000
Armor penetration after ERA, mm	300
Safe operational temperature range, °C	-40....50
Rate of fire, rds/min	4.....6

**WEAPON SYSTEM**

SPG-9M heavy anti-tank grenade launcher

**PACKING**

Dimensions, mm	1290x520x298
6 rounds in a case	
Gross weight, kg	56





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## **OG-9VM ROUND WITH OG-9M FRAGMENTATION GRENADE**

**NSN: 1310-50-0001572**



It is designed for destroying the enemy troops in the open, in trenches, field-type shelters or brick fortifications.

### **CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	5,480
Grenade weight, kg	3,680
Propellant charge weight, kg	1,800
Muzzle velocity, m/s	316
Maximum range, m	4500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### **WEAPON SYSTEM**

SPG-9M heavy anti-tank grenade launcher

### **PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	60







## OG-9VMZ ROUND WITH OG-9MZ FRAGMENTATION GRENADE

NSN: 1310-50-0011756



It is intended for use against enemy manpower located in the open, in trenches, field-type shelters or brick fortifications. The grenade is fitted with a warhead containing prefabricated fragments and a more powerful explosive that almost doubles its combat power.

### CHARACTERISTICS

Caliber, mm	73
Round weight, kg	5,480
Grenade weight, kg	3,680
Propellant charge weight, kg	1,800
Muzzle velocity, m/s	340
Maximum range, m	4500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

### WEAPON SYSTEM

SPG-9M heavy anti-tank grenade launcher

### PACKING

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	60

### Static test :

Metal sheet with dimensions

Width 1000 mm

Height 2000 mm

The metal sheet is placed at 5-7 m radius  
from the exact point of the burst of warhead

Approximate number of fragments, pcs. 183



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## **TBFR-9VMZ ROUND WITH TBFG-9VMZ THERMOBARIC FRAGMENTATION GRENADE**

**NSN : 1310-50-001-5843**

Intended for destroying enemy emplacements (shelters, stone, brick or concrete fortifications), light armoured and unarmored vehicles and enemy manpower.

### **CHARACTERISTICS**

Main hollow-charge warhead caliber, mm	73
Round weight, kg	5,48
Grenade weight, kg	3,68
Propellant charge weight, kg	1,8
PTBS weight, kg	0,740
Muzzle velocity, m/s	340
Number of hitting fragments, pcs.	760
Maximum range, m	4500
Safe operational temperature range, °C	-40....50
Rate of fire, rds/min	4.....6

### **WEAPON SYSTEM**

SPG-9M heavy anti-tank grenade launcher

### **PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	55,5

### **Static test :**

**Metal sheet with dimensions**

**Width 1000 mm**

**Height 2000 mm**

**The metal sheet is placed at 5-7 m radius  
from the exact point of the burst of warhead  
Approximate number of fragments, pcs. 176**







**PG-15V ROUND  
WITH PG-9  
ANTI-TANK GRENADE**

**NSN: 1310-50-0001568**



It is designed for destroying hostile armoured vehicles, mechanized troops and manpower in field-type shelters.

**CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	3,395
Grenade weight, kg	2,520
Propellant charge weight, kg	0,875
Muzzle velocity, m/s	400
Direct fire range, m	800
Sighting range, m	1300
Armour penetration, mm	300
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	4...6

**WEAPON SYSTEM**

2A28 gun mounted on BMP-1

**PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	51





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**PG-15VN ROUND  
WITH PG-9N  
ANTI-TANK GRENADE**

**NSN: 1310-50-0001569**



It is designed for destroying hostile armoured vehicles, mechanized troops and manpower in field-type shelters.

**CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	3,505
Grenade weight, kg	2,630
Propellant charge weight, kg	0,875
Muzzle velocity, m/s	400
Direct fire range, m	800
Sighting range, m	1300
Armour penetration, mm	400
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	6...8

**WEAPON SYSTEM**

2A28 gun mounted on BMP-1

**PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	52







## **PG-15VN HOLLOW-CHARGE PRACTICE ROUND**



The PG-15VN hollow-charge practice round is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication.

The practice round possesses the same dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.

### **CHARACTERISTICS**

Grenade launcher caliber, mm	73
Round weight, kg	3,505
Weight of grenade, kg	2,630
Weight of propellant charge, kg	0,875
Muzzle velocity, m/s	400
Direct fire range, m	800
Sighting range, m	1300
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	6...8

### **WEAPON SYSTEM**

2A28 gun mounted on BMP-1

### **PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	52





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## **OG-15VM ROUND WITH OG-9M FRAGMENTATION GRENADE**

**NSN: 1310-50-0001567**



It is designed for destroying the enemy troops in the open, in trenches, field-type shelters or brick fortifications.

### **CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	4,570
Grenade weight, kg	3,680
Propellant charge weight, kg	0,890
Muzzle velocity, m/s	290
Maximum range, m	4500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	6...8

### **WEAPON SYSTEM**

2A28 gun mounted on BMP-1

### **PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	52







## OG-15VMZ ROUND WITH OG-9MZ FRAGMENTATION GRENADE

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NSN: 1310-50-0011757



It is intended for use against enemy manpower located in the open, in trenches, field-type shelters or brick fortifications. The grenade is fitted with a warhead containing prefabricated fragments and a more powerful explosive that almost doubles its combat power.

### CHARACTERISTICS

Caliber, mm	73
Round weight, kg	4,570
Grenade weight, kg	3,680
Propellant charge weight, kg	0,890
Muzzle velocity, m/s	310
Maximum range, m	4500
Safe operational temperature range, °C	-40...50
Rate of fire, rds/min	6...8

### WEAPON SYSTEM

2A28 gun mounted on the BMP-1 vehicle

### PACKING

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	52

### Static test :

Metal sheet with dimensions

Width 1000 mm

Height 2000 mm

The metal sheet is placed at 5-7 m radius from the exact point of the burst of warhead

Approximate number of fragments, pcs. 179





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# **TBFR-15VMZ ROUND WITH TBFG-9VMZ THERMOBARIC FRAGMENTATION GRENADE**

**NSN : 1310-50-001-5844**



Intended for destroying enemy emplacements (shelters, stone, brick or concrete fortifications), light armoured and unarmoured vehicles and enemy troops.

## **CHARACTERISTICS**

Caliber, mm	73
Round weight, kg	4,570
Grenade weight, kg	3,680
Propellant charge weight, kg	0,890
PTBS weight, kg	0,740
Muzzle velocity, m/s	310
Maximum range, m	4500
Number of hitting fragments, pcs.	800
Weight of the fragments, kg	0,762
Safe operational temperature range, °C	-40...+50
Rate of fire, rds/min	4...6

## **WEAPON SYSTEM**

2A28 gun mounted on BMP-1

## **PACKING**

Dimensions, mm	1082x520x298
6 rounds in a case	
Gross weight, kg	51

## **Static test :**

Metal sheet with dimensions

Width 1000 mm

Height 2000 mm

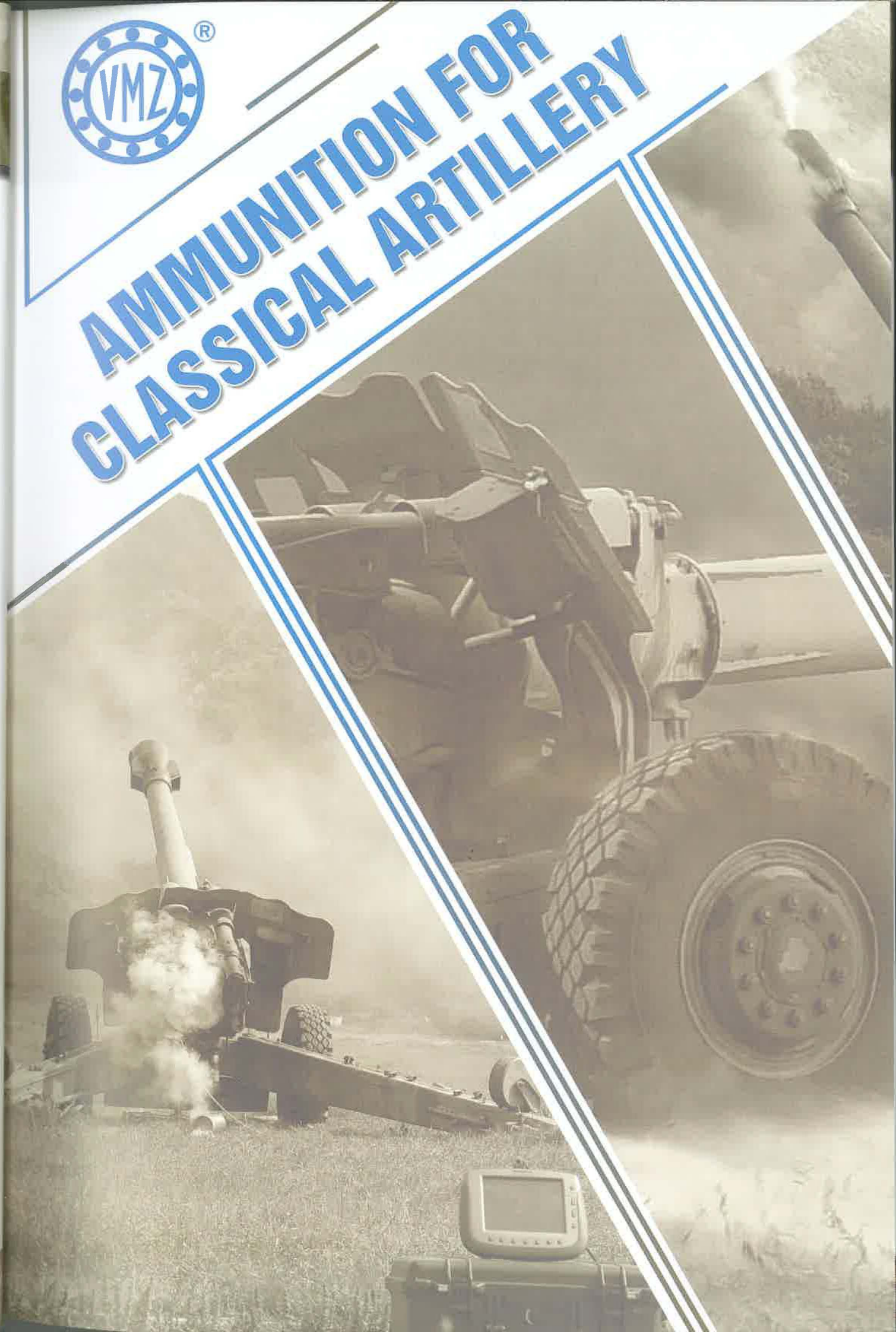
The metal sheet is placed at 5-7 m radius from the exact point of the burst of warhead  
Approximate number of fragments, pcs. 194







# AMMUNITION FOR CLASSICAL ARTILLERY



**- 38 -****100 mm ROUND  
WITH HOLLOW-CHARGE  
NON-SPINNING PROJECTILE****NSN: 1315-50-0001539**

The 100 mm round with a hollow-charge non-spinning projectile is unitary. It is designed for destroying the enemy's armoured vehicles, manpower in field shelters, fortifications and engineering constructions, artillery sites, mortars, anti-missile systems and other enemy targets.

**CHARACTERISTICS**

Round weight, kg	22,850
Type of charge	Special
Muzzle velocity, m/s	900
Direct fire range, m	1000
Armour penetration, mm	300
Safe operational temperature range, °C	-40...50

**SYSTEM**

BS-3 field gun (M1944), D-10T, D-10S, D-10T2S tank guns,  
SAU-100 self-propelled gun

**PACKING**

Dimensions, mm	1205x430x253
2 rounds in a wooden case	
Gross weight, kg	75







## **100 mm HE-FRAG PRACTICE ROUND**



The 100 mm HE-FRAG practice round is unitary. It is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication. The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.

### **CHARACTERISTICS**

	<b>Full</b>	<b>Reduced</b>
Type of charge		
Round weight, kg	30,270	26,740
Muzzle velocity, m/s	900	600
Max. range, m	20650	13640
Safe operational temperature range, °C	-40...50	-40...50

### **SYSTEM**

BS-3 field gun (M1944),  
D-10T, D-10S, D-10T2S tank guns,  
SAU-100

### **PACKING**

Dimensions, mm	1205x430x253	1205x430x253
2 rounds in a wooden case		
Gross weight, kg	87	80



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## **100 mm ROUND WITH HE-FRAG PROJECTILE**

Full charge  
**NSN: 1315-50-0012414**

Reduced charge  
**NSN: 1315-50-0012415**



The 100 mm round with HE-FRAG projectile is unitary. It is designed for destroying the enemy manpower and equipment, attacking artillery sites, anti-missile systems and other targets, destroying field defensive and engineering constructions, making passages in mine fields and defense wirings.

### **CHARACTERISTICS**

	<b>Full</b>	<b>Reduced</b>
Type of charge		
Round weight, kg	30,270	26,740
Muzzle velocity, m/s	900	600
Range, m	20650	13640
Safe operational temperature range, °C	-40...50	-40...50

### **WEAPON SYSTEM**

BS-3 field gun (M1944),  
D-10T, D-10S, D-10T2S tank guns,  
SAU-100 self-propelled gun

### **PACKING**

Dimensions, mm	1205x430x253	1205x430x253
2 rounds in a wooden case		
Gross weight, kg	87	80







## 122 mm ROUND WITH HE-FRAG PROJECTILE

Full charge  
NSN: 1315-50-0001540

Reduced charge  
NSN: 1315-50-0001541

The 122 mm round with a HE-FRAG projectile is a separate loading munition. It is designed for destroying the enemy manpower and equipment in the open or in field shelters, attacking artillery sites, anti-missile systems and other targets, destroying field defensive and engineering constructions, making passages in mine fields and defense wirings.

### CHARACTERISTICS

Type of charge	Full	Reduced
Weight of projectile (fuzed), kg	21,760	21,760
Weight of charge, kg	7,835	6,435
Muzzle velocity, m/s	690	565
Maximum range, m	15300	12500
Safe operational temperature range, °C	-40...50	-40...50



### WEAPON SYSTEM

D-30 howitzer,  
2S1 self-propelled howitzer

### PACKING

Dimensions, mm	1190x434x258	1190x434x258
2 rounds in a wooden case		
Gross weight, kg	83	80



**- 42 -****122 mm ROUND  
WITH HOLLOW-CHARGE  
NON-SPINNING PROJECTILE****NSN: 1315-50-0001542**

The 122 mm round with a hollow-charge non-spinning projectile is a separate loading munition. It is designed for destroying armoured equipment, manpower in field shelters, fortifications and engineering constructions, artillery sites, mortars, anti-missile systems and other enemy targets.

**CHARACTERISTICS**

Weight of projectile, kg	18,200
Weight of charge, kg	7,835
Type of charge	Full
Muzzle velocity, m/s	690
Direct fire range, m	1000
Armour penetration, mm	400
Safe operational temperature range, °C	-40...50

**WEAPON SYSTEM**

D-30 howitzer,  
2S1 self-propelled howitzer

**PACKING**

Dimensions, mm	1298x439x253
2 rounds in a wooden case	
Gross weight, kg	80







## 122 mm HE-FRAG PRACTICE ROUND

The 122 mm HE-FRAG practice round is a separate loading munition. It is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication.

The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.

### CHARACTERISTICS

Type of charge	Full	Reduced
Projectile weight, kg	21,760	21,760
Charge weight, kg	7,835	6,435
Muzzle velocity, m/s	690	565
Maximum range, m	15300	12500
Safe operational temperature range, °C	-40...50	-40...50



### WEAPON SYSTEM

D-30 howitzer,  
2S1 self-propelled howitzer

### PACKING

Dimensions, mm	1190x434x258	1190x434x258
2 rounds in a wooden case		
Weight, kg	83	80





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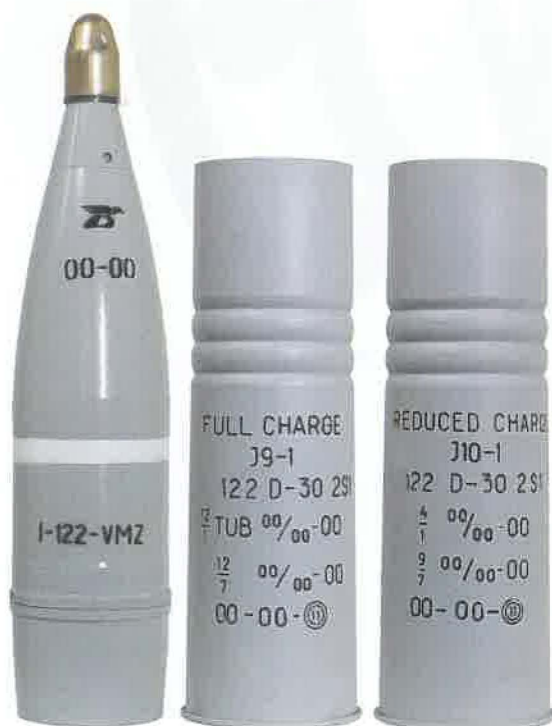
## 122 mm I-122-F-VMZ ROUND WITH I-122-VMZ ILLUMINATING PROJECTILE

## 122 mm I-122-R-VMZ ROUND WITH I-122-VMZ ILLUMINATING PROJECTILE

Full charge  
NSN: 1315-50-0011825

Reduced charge  
NSN: 1315-50-0011824

It is designed for sudden illumination of separate targets and areas occupied by the enemy, during combat at night or under reduced visibility. The rounds are also used for illumination of objects which are attacked by tanks or motorized infantry, for line-of-march indication, or as light reference points and signalling means.



### CHARACTERISTICS

	Full	Reduced
Type of charge	Full	Reduced
Weight of projectile, kg	21,300	21,300
Weight of charge, kg	7,835	6,430
Luminous intensity, cd	≥1 000 000	≥1 000 000
Rate of descent, m/s	7,5 – 9,5	7,5 – 9,5
Burning time, s	≥50	≥50
Muzzle velocity, m/s	685	560
Max. range, m	15059	12420
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

D-30 howitzer

### PACKING

Dimensions, mm	1190x434x258	1190x434x258
2 rounds in a wooden case		
Gross weight, kg	83	80







## 122 mm ILLUMINATING PRACTICE ROUND

The 122 mm illuminating practice round is a separate loading munition. It is a live round with a practice warhead and is used for training of personnel and firing exercise with hits indication.

The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.

### CHARACTERISTICS

	Full	Reduced
Type of charge	Full	Reduced
Projectile weight, kg	21,300	21,300
Charge weight, kg	7,835	6,435
Illumination intensity, cd	≥1 000 000	≥1 000 000
Rate of descent, m/s	7,5 – 9,5	7,5 – 9,5
Burn time, s	≥50	≥50
Muzzle velocity, m/s	685	561
Maximum range, m	15059	12429
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

D-30 howitzer, 2S1 self-propelled howitzer

### PACKING

Dimensions, mm	1190x434x258	1190x434x258
2 rounds in a wooden case		
Weight, kg	83	80



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## 125 mm HE-FRAG PRACTICE ROUND



The 125 mm HE-FRAG practice round is a separate loading munition. It is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication.

The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.

### CHARACTERISTICS

Projectile weight, kg	23
Charge weight, kg	9,500
Type of charge	Charge in combustible cartridge case
Muzzle velocity, m/s	850
Max. range, m	12200
Safe operational temperature range, C	-40...50

### WEAPON SYSTEM

D-81 tank gun

### PACKING

Dimensions, mm	817x535x292
1 round in a wooden case	
Gross weight, kg	60





## 130 mm ROUND WITH HE-FRAG PROJECTILE

Full charge  
NSN: 1320-50-0001543

Reduced charge  
NSN: 1320-50-0001544

The 130 mm round with a HE-FRAG projectile is a separate loading munition. It is designed for destroying the enemy manpower and equipment in the open or in field shelters, attacking artillery sites, anti-missile systems and other targets, destroying field defensive and engineering constructions, making passages in mine fields and defense wirings.



### CHARACTERISTICS

Type of charge	Full	Reduced
Weight of projectile (fuzed), kg	33,400	33,400
Weight of charge, kg	25,730	18,500
Muzzle velocity, m/s	930	705
Maximum range, m	27490	19130
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

M-46 gun

### PACKING

Dimensions, mm	960x488x280	960x488x280
1 round in a wooden case		
Weight, kg	85	79



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## 130 mm HE-FRAG PRACTICE ROUND

The 130 mm HE-FRAG practice round is a separate loading munition. It is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication.

The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.



### CHARACTERISTICS

	Full	Reduced
Type of charge		
Weight of projectile (fuzed), kg	33,400	33,400
Charge weight, kg	25,730	18,500
Muzzle velocity, m/s	930	705
Max. range, m	27490	19130
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

M-46 gun

### PACKING

Dimensions, mm	960x488x280	960x488x280
1 round in a wooden case		
Gross weight, kg	85	79





## 130 mm ROUND WITH LONG-RANGE HE-FRAG PROJECTILE



The 130 mm round with a long-range HE-FRAG projectile is a separate loading munition. It is designed for destroying the enemy manpower in the open or in field shelters, demolishing log emplacements and other field installations, attacking artillery sites and destroying military equipment, making passages in mine fields and defense wirings, destroying enemy back areas, railway junctions, headquarters and other targets.

The increased range is achieved through a specially developed base-bleed assembly, fixed at the bottom of the projectile.

### CHARACTERISTICS

Type of charge	Full special
Muzzle velocity, m/s	885
Max. range, m	32490
Safe operational temperature range	-40...50

### WEAPON SYSTEM

M-46 gun

### PACKING

Dimensions, mm	960x488x280
1 round in a wooden case	
Gross weight, kg	89





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## 152 mm I-152-F-VMZ ROUND WITH I-152-VMZ ILLUMINATING PROJECTILE

## 152 mm I-152-R-VMZ ROUND WITH I-152-VMZ ILLUMINATING PROJECTILE

Full charge  
NSN : 1320-50-001-5838  
Reduced charge  
NSN : 1320-50-001-5839

It is designed for sudden illumination of separate targets and areas occupied by the enemy, during combat at night or under reduced visibility. The rounds are also used for illumination of objects which are attacked by tanks or motorized infantry, for line-of-march indication, or as light reference points and signalling means.

### CHARACTERISTICS

	Full	Reduced
Type of charge		
Weight of projectile, kg	41, 950	41,950
Weight of charge, kg	16,360	12,010
Luminous intensity, cd	≥1 000 000	≥1 000 000
Rate of descent, m/s	7,5 ... 9,5	7,5 ... 9,5
Burning time, s	≥50	≥50
Muzzle velocity, m/s	652	509
Max. range, m	16720	12820
Safe operational temperature range, °C	-40...50	-40...50



### WEAPON SYSTEM

D-20 howitzer  
2S3 self-propelled howitzer and its modifications

### PACKING

Dimensions, mm 835x488x280  
1 round per case  
Gross weight, kg 80 75







## 152 mm HE-FRAG PRACTICE ROUND

The 152 mm HE-FRAG practice round is a separate loading munition. It is a live round with a practice warhead and is used for training of personnel and target firing exercise with hits indication.

The practice round possesses the same overall dimensions, weight and ballistic characteristics as the live ammunition.

The use of practice rounds preserves the practice targets at firing ranges, reduces the risk of fire and increases the safety while conducting demonstrative and training firing.



### CHARACTERISTICS

	Full	Reduced
Type of charge		
Projectile weight, kg	43,906	43,906
Charge weight, kg	16,360	12,010
Muzzle velocity, m/s	655	511
Maximum range, m	17410	13400
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

D-20 gun-howitzer,  
ML-20 howitzer-gun,  
2S3 self-propelled howitzer (2S3M)

### PACKING

Dimensions, mm	835x488x280	835x488x280
1 round in a wooden case		
Gross weight, kg	82	77





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## 152 mm ROUND WITH HE-FRAG PROJECTILE

Full charge  
**NSN: 1320-50-0001545**

Reduced charge  
**NSN: 1320-50-0001546**

The 152 mm round with a HE-FRAG projectile is a separate loading munition. It is designed for destroying the enemy manpower and equipment in the open or in field shelters, attacking artillery sites, anti-missile systems and other targets, destroying field defensive and engineering constructions, making passages in mine fields and defense wirings.



### CHARACTERISTICS

	Full	Reduced
Type of charge		
Weight of projectile (fuzed), kg	43,906	43,906
Weight of charge, kg	16,360	12,010
Muzzle velocity, m/s	655	511
Maximum range, m	17410	13400
Safe operational temperature range, °C	-40...50	-40...50

### WEAPON SYSTEM

ML-20 howitzer-gun,  
D-20 gun-howitzer,  
2S3 (2S3M) self-propelled howitzer

### PACKING

Dimensions, mm	835x488x280	835x488x280
1 round in a wooden case		
Gross weight, kg	82	77







## 152 mm VRS-546 ROUND WITH JAMMER-CARRYING PROJECTILE "STARSHEL"

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NSN: 1320-50-0000449

It is designed for delivering single-action radio jamming transmitters in areas occupied by the enemy, for creating barrage VHF jamming in the enemy tactical commanding units. It is fired from the D-20 gun-howitzer, ML-20 howitzer-gun and 2S-3M self-propelled howitzer.

### CHARACTERISTICS

Projectile caliber, mm	152
Range of jamming, m	
- maximum	16900
- minimum	4000
Height of separation above target, m	
- maximum	1500
- minimum	800
Angle of impact with the ground	up to 30 degrees from the normal to terrain
Operational range, m	not less than 700
Frequency range, MHz	20 .. 100
Weight of projectile (unfuzed), kg	43
Weight of charge in a cartridge case	
- full variable charge, kg	16,400
- reduced variable charge, kg	12
Weight of jammer, kg	3,800

### WEAPON SYSTEM

D20 gun-howitzer,  
ML-20 howitzer-gun,  
2S3 self-propelled howitzer

### PACKING

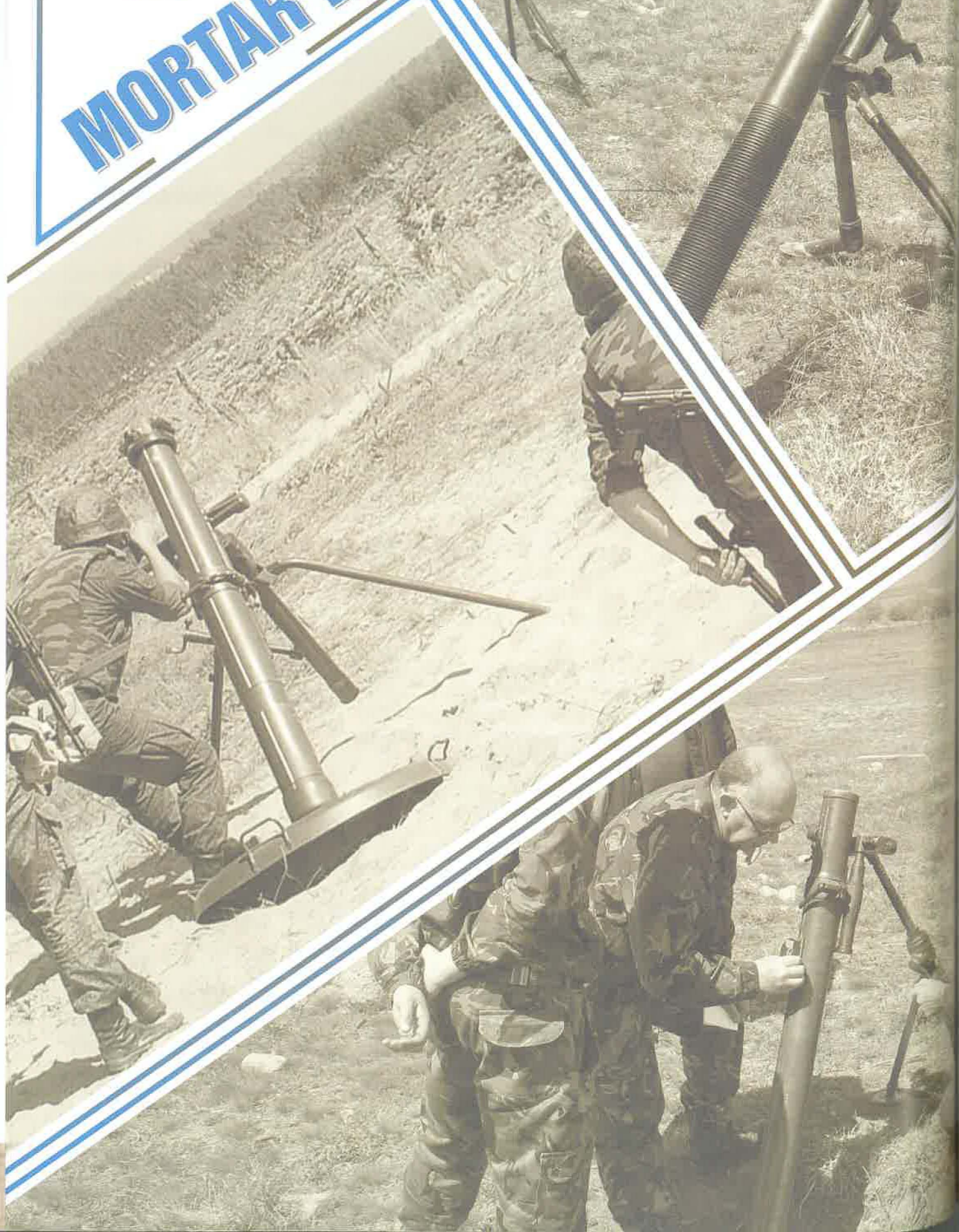
Dimensions, mm	835x488x280
1 round in a wooden case	
Gross weight, kg	82







# MORTAR BOMBS







## WARRIOR 60 COMMANDO MORTAR

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## WARRIOR 60 COMMANDO

The 60 mm Mortar WARRIOR 60 COMMANDO refers to a class of infantry light mortars designed for maximum portability and rapid deployment.

Lightweight, effective support weapon for close, medium, long & extended range

User friendly, reliable all weather operation.

### TECHICAL DATA

Calibre:	60 mm
Max. velocity speed:	142 m/s
Max. range of shooting:	1650m
Min. range of shooting:	50m
Angle of vertical directing/ aiming :	45° - 85°
Max. operating gas pressure	250bar
Overall length	840 mm
Weight:	5.95 kg
Firing rate:	15 rounds/min
Personal:	2 persons

### SIGHT MP 60C

### PACKING

Wooden case with 6 pcs in a case:	
Case dimensions:	L/W/H: 1240x640x440 mm
Gross weight:	88 kg
Net weight:	50 kg
Wooden case with 18 pcs haversacks in a case:	
Case dimensions:	L/W/H: 1240x640x440 mm
Gross weight:	60 kg
Net weight:	20 kg





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## WARRIOR 81 D MORTAR

## WARRIOR 81 D MORTAR

The 81 mm WARRIOR 81 D MORTAR is smoothbore muzzle-loading Mortar, that consist of a barrel, a bipod, a base plate, a double load prevention mechanism and a sight, with high firing capacity and accuracy and is designed for easy operation and maintenance.

The mortar has high rate of fire, light weight and could be quickly disassembled into main component parts.

WARRIOR 81 D MORTAR is intended to destroy by curved-trajectory fire the enemy force and firing assets, located in open as well as in field entrenchments.

### TECHICAL DATA

Calibre:	81 mm
Barrel Length:	1370 mm
Base plate diameter:	600mm
Max. range of shooting:	6450m
Max. operating pressure of gas:	950 bar
Elevation range :	700-1500 mm
Traverse range:	300mm
Fire rate:	- with correction of fire direction 15 rounds/min - without corrections of fire direction 20 rounds/min

Weight total:	53,40 kg
barrel with breech block :	16,50 kg
base plate assy:	24.00 kg
bipod assy:	11,90 kg
sight:	1.00 kg
Personal:	3-5 people
<b>SIGHT MP 81</b>	

### PACKING

Wooden case with 1 set -weapon and accessories:	
Case dimensions: L/W/H:	1736/831/446 mm
Case capacity:	0.643 m <sup>3</sup>
Gross weight :	134 kg
Net weight:	71 kg







## WARRIOR 82 D MORTAR

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## WARRIOR 82 D MORTAR

The 82 mm WARRIOR 82 D MORTAR is smoothbore muzzle-loading Mortar, that consist of a barrel, a bipod, a base plate, a double load prevention mechanism and a sight, with high firing capacity and accuracy and is designed for easy operation and maintenance.

The mortar has high rate of fire, light weight and could be quickly disassembled into main component parts.

WARRIOR 82 D MORTAR is intended to destroy by curved-trajectory fire the enemy force and firing assets, located in open as well as in field entrenchments.

### TECHICAL DATA

Calibre:	82 mm
Muzzle velocity:	270 m/sec
Barrel Length:	1350 mm
Base plate diameter:	600 mm
Max. range of shooting:	4600 m
Min. range of shooting:	100 m
Max. operating pressure of gas:	650 bar
Elevation angle :	45-48 °
Traverse (without moving bipod)	+/- 4,0°
Fire rate:	- with correction of fire direction 15 rounds/min - without corrections of fire direction 20-25 rounds/min
Weight total:	45,50 kg
barrel with breech block (body):	16,60 kg
base plate:	17,00 kg
bipod:	11,90 kg
sight:	1.00 kg
Personal:	3-5 people
<b>SIGHT MP 82</b>	

### PACKING

Wooden case with 1 set -weapon and accessories:	
Case dimensions: L/W/H:	1736/831/446 mm
Case capacity:	0.643 m <sup>3</sup>
Gross weight :	134 kg
Net weight:	71 kg





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## WARRIOR 120 D MORTAR

## WARRIOR 120 D MORTAR

WARRIOR 120 D MORTAR is a light-weight weapon of infantry close support, designed for annihilation of manpower and for destroying of firing points by short fire engagements.

It is particularly effective on intersected and hilly terrains, where the enemy may be hidden by a rear slope.

The Mortar can effectively open breaches in wire barriers or mine fields, demolish lighter fortifications and remove top soil covers over heavy bunkers. The Mortar is also well suited for combat against mechanized units, by destroying their infantry.

It is also suitable for making of smoke screens and for target illumination at night.

The mortar is particularly suited for the mountaineer, special and airborne units, as well as for territorial defense units.

### TECHICAL DATA

#### Calibre:

120 mm

#### Max. velocity speed:

325 m/s

#### Average max. pressure of charge by 15°C:

1130kg/ cm<sup>2</sup>

#### Distance of shooting with fragmentation munitions mine:

min -480 m;  
max -7100 m;

#### Angle of vertical directing/ aiming :

46° -80°

#### Angle of horizontal aiming:

- without moving the bi-pode, no less than - +/- -5°
- when moving the bi-pode, no less than +/- 26°

#### Weight (in fire-ready position):

210 kg

#### weight of fragmentation munitions mine:

16kg

#### Firing rate:

15 (rounds/minute)

#### Personal:

5 people

### SIGHT MP 120

### MEANS OF TRANSPORT

WARRIOR 120 D MORTAR may be transported:

towed by motor vehicle

towed by single animal/ pack of three

by helicopter, without additional accessories

parachuted by cargo parachute with pallet

man-carried, dismantled to sections and using man-pack carriers, over short distances

in snow or in the mountain, dismantled to sections and moved by sleds

loaded on motor-vehicles for long distance

transported by rail or sea







## **60 mm ROUND WITH HE-FRAG MORTAR BOMB**

**NSN : 1310-50-001-5856**



The 60 mm mortar round with high-explosive fragmentation bomb is intended for use against stationary soft targets, such as troops concentrations, machine-gun positions, and vehicles. The damage effect is achieved through the fragments produced upon detonation.

### **TECHNICAL SPECIFICATIONS**

Length of fuze round, max, mm	310
Calibre, mm	60
Weight of round, kg	1,65
Weight of explosive charge, kg	0,202
Armament	TNT
Muzzle velocity, m/s	222
Maximum firing range, m	3130
Fuze	O-4M or O-4N

### **WEAPON SYSTEM**

Comando, M2, M19, M224, M224A1, M60-16, M6-111 Mortars

### **PACKING**

10 rounds in a wooden case	
Overall dimensions, mm	388x380x215
Gross weight, kg	25





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## 81 mm ROUND WITH HE-FRAG MORTAR BOMB

NSN : 1315-50-001-5860



The 81 mm round with a HE-FRAG mortar bomb is intended to defeat static soft targets, troops concentrations, machine-gun positions, vehicles, etc. in a radius of up to 13 m upon firing to a maximum range of not less than 2500 m under conditions of operational use. The killing effect is achieved due to the great number of fragments and powerful high-explosive action following the detonation.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	489
Caliber, mm	81
Weight of the round, kg	4,3
Armament	TNT
Weight of explosive charge, kg	0,766
Muzzle velocity, max, m/sec	312
Maximum range, m	6200
Fuze	O-4M or O-4N

### WEAPON SYSTEM

M1, M29, L16 A1/A2, M8-522,  
M081-61C, Tampella, M81MA Mortars

### PACKING

6 rounds in a wooden case	540x337x258
Overall dimensions, mm	44
Gross weight, kg	







## 81 mm ROUND WITH THERMOBARIC BOMB



The 81mm round with thermobaric bomb for all types of 81mm caliber mortars is intended for use against enemy manpower located in the open, in urban type shelters, fortifications, difficult to access areas and vehicles. It possesses strong destructive force resulting from the implemented polymeric thermobaric mixture and disrupts the combat activities of the enemy, thus reducing the number of civilian casualties to a minimum.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	489
Caliber, mm	81
Weight of the round, kg	4,3
Armament	PTBS
Weight of explosive charge, kg	0,5
Muzzle velocity, max, m/sec	312
Maximum range, m	6200
Fuze	O-4M or O-4N

### WEAPON SYSTEM

M1, M29, L16 A1/A2, M8-522,  
M081-61C, Tampella, M81MA Mortars

### PACKING

6 rounds in a wooden case	
Overall dimensions, mm	540x337x258
Gross weight, kg	44





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## 81 mm S ROUND WITH HE-FRAG MORTAR BOMB

NSN : 1315-50-001-5881



The 81 mm mortar round with high-explosive fragmentation bomb made of sphero-graphite cast iron for 81 mm mortar is intended for use against enemy manpower located in the open, in unarmored vehicles and machine-gun nests. The enhancement of the fragmentation effect is a result of the powerful explosive material and the high mechanical properties of the body.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	330
Caliber, mm	81
Weight of the round, kg	3,3
Armament	TNT
Weight of explosive charge, kg	0,45
Muzzle velocity, max, m/sec	211
Maximum range, m	3040
Fuze	O-4M or O-4N

### WEAPON SYSTEM

M1, M29, L16 A1/A2, M8-522,  
M081-61C, Tampella, M81MA Mortars

### PACKING

8 rounds in a wooden case	
Overall dimensions, mm	444x421x268
Gross weight, kg	42







## 81 mm S ROUND WITH THERMOBARIC BOMB



The 81mm round with thermobaric bomb for all types of 81mm caliber mortars is intended for use against enemy manpower located in the open, in urban type shelters, fortifications, difficult to access areas and vehicles.

It possesses strong destructive force resulting from the implemented polymeric thermobaric mixture and disrupts the combat activities of the enemy, thus reducing the number of civilian casualties to a minimum.

The generated upon detonation overpressure is 50 KPa in a radius of no less than 7m in the open or in enclosed space with a volume of 240m<sup>3</sup>.

The temperature rises to over 800°C.

The fragmentation effect exceeds the fragmentation effect of conventional 81mm high-explosive fragmentation bombs by 40 to 60 percent in the open and by over 200 percent in enclosed spaces.

### TECHNICAL SPECIFICATIONS

Length of fused round, max, mm	330
Caliber, mm	81
Weight of the round, kg	3,20
Armament	PTBS
Weight of explosive charge, kg	0,3
Muzzle velocity, max, m/sec	211
Maximum range, m	3040
Fuze	O-4M or O-4N

### WEAPON SYSTEM

M1, M29, L16 A1/A2, M8-522,  
M081-61C, Tampella, M81MA Mortars

### PACKING

8 rounds in a wooden case  
Overall dimensions, mm  
Gross weight, kg

444x421x268  
42





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## 82 mm ROUND WITH HE-FRAG MORTAR BOMB

NSN : 1315-50-001-5861



The 82mm mortar round with high-explosive fragmentation bomb made of sphero-graphite cast iron for 82mm mortar is intended for use against enemy manpower located in the open, in unarmored vehicles and machine-gun nests. The enhancement of the fragmentation effect is a result of the powerful explosive material and the high mechanical properties of the body.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	330
Caliber, mm	82
Weight of the round, kg	3,3
Armament	TNT
Weight of explosive charge, kg	0,45
Muzzle velocity, max, m/sec	211
Maximum range, m	3040
Fuze	O-4M or O-4N

### WEAPON SYSTEM

2B14, BM-37, BM-41,  
BM-43, M82MA Mortars

### PACKING

8 rounds in a wooden case  
Overall dimensions, mm  
Gross weight, kg

444x421x268  
42







## 82 mm ROUND WITH THERMOBARIC BOMB



The 82mm round with thermobaric bomb for all types of 82mm caliber mortars is intended for use against enemy manpower located in the open, in urban type shelters, fortifications, difficult to access areas and vehicles.

It possesses strong destructive force resulting from the implemented polymeric thermobaric mixture and disrupts the combat activities of the enemy, thus reducing the number of civilian casualties to a minimum.

The generated upon detonation overpressure is 50 KPa in a radius of no less than 7m in the open or in enclosed space with a volume of 240m<sup>3</sup>.

The temperature rises to over 800°C.

The fragmentation effect exceeds the fragmentation effect of conventional 82mm high-explosive fragmentation bombs by 40 to 60 percent in the open and by over 200 percent in enclosed spaces.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	330
Caliber, mm	82
Weight of the round, kg	3,3
Armament	PTBS
Weight of explosive charge, kg	0,3
Muzzle velocity, max, m/sec	211
Maximum range, m	3040
Fuze	O-4M or O-4N

### WEAPON SYSTEM

2B14, BM-37, BM-41,  
BM-43, M82MA Mortars

### PACKING

8 rounds in a wooden case  
Overall dimensions, mm  
Gross weight, kg

444x421x268  
42





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## 120 mm ROUND WITH HE-FRAG MORTAR BOMB

NSN : 1315-50-001-5859



The 120mm mortar round with high-explosive fragmentation bomb made of spherio-graphite cast iron for 120mm mortar is intended for use against enemy manpower located in the open, in unarmored vehicles and machine-gun nests. The enhancement of the fragmentation effect is a result of the powerful explosive material and the high mechanical properties of the body.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	661
Caliber, mm	120
Weight of the round, kg	16
Armament	TNT
Weight of explosive charge, kg	1,77
Muzzle velocity, max, m/sec	274
Maximum range, m	5700
Fuze	V-RM

### WEAPON SYSTEM

PM-38, PM-43, M-120,  
2B11 Mortars

### PACKING

2 rounds in a wooden case  
Overall dimensions, mm  
Gross weight, kg

786x393x280  
50







## 120 mm ROUND WITH THERMOBARIC BOMB

NSN : 1315-50-001-5858



The 120mm round with thermobaric bomb for all types of 120mm caliber mortars is intended for use against enemy manpower located in the open, in urban type shelters, fortifications, difficult to access areas and vehicles. It possesses strong destructive force resulting from the implemented polymeric thermobaric mixture and disrupts the combat activities of the enemy, thus reducing the number of civilian casualties to a minimum. The generated aerosol screen is ignited, thus generating overpressure. The impact wave follows the terrain and pours into trenches and other field-type defensive fortifications.

### TECHNICAL SPECIFICATIONS

Length of fuze round, max, mm	661
Caliber, mm	120
Weight of the round, kg	16
Armament	PTBS
Weight of explosive charge, kg	1,8
Muzzle velocity, m/sec	274
Maximum range, m	5700
Fuze	V-RM

### WEAPON SYSTEM

PM-38, PM-43, M-120,  
2B11 Mortars

### PACKING

2 rounds in a wooden case	
Overall dimensions, mm	786x393x280
Gross weight, kg	50





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## **HG-32T THERMOBARIC HAND GRENADE**

**NSN : 1330-50-001-5689**

The hand thermobaric grenades are intended to destroy enemy troops located in shelters of different types and open areas, and also to bring out of operation automotive and lightly armoured vehicles. As a result of their use, a fire cloud is generated within a few seconds across the damage area with a volume of about 13 m<sup>3</sup> and a temperature of 2500 up to 3000 degrees. This makes it possible not only to destroy hostile troops, but to bring out of operation lightly armoured vehicles as well.

### **CHARACTERISTICS**

Diameter, mm	60
Height, mm	116
Weight, kg	0,5 max
Type of igniting fuze	DVM
Delay time, s	3,2 up to 4
Lethal radius in open areas, m	6
Lethal radius in closed spaces, m	12
Thermobaric mixture weight, kg	0,32
Detonation temperature, °C	minimum 2000
Operating temperature range, °C	(from -40 °C up to +52 °C)
Explosive hazard class	1.1F UN 0292

### **PACKING**

30 Grenades, wrapped in waxed paper, are packed in a wooden case.

Overall dimensions, mm

584x400x228

Gross weight, kg

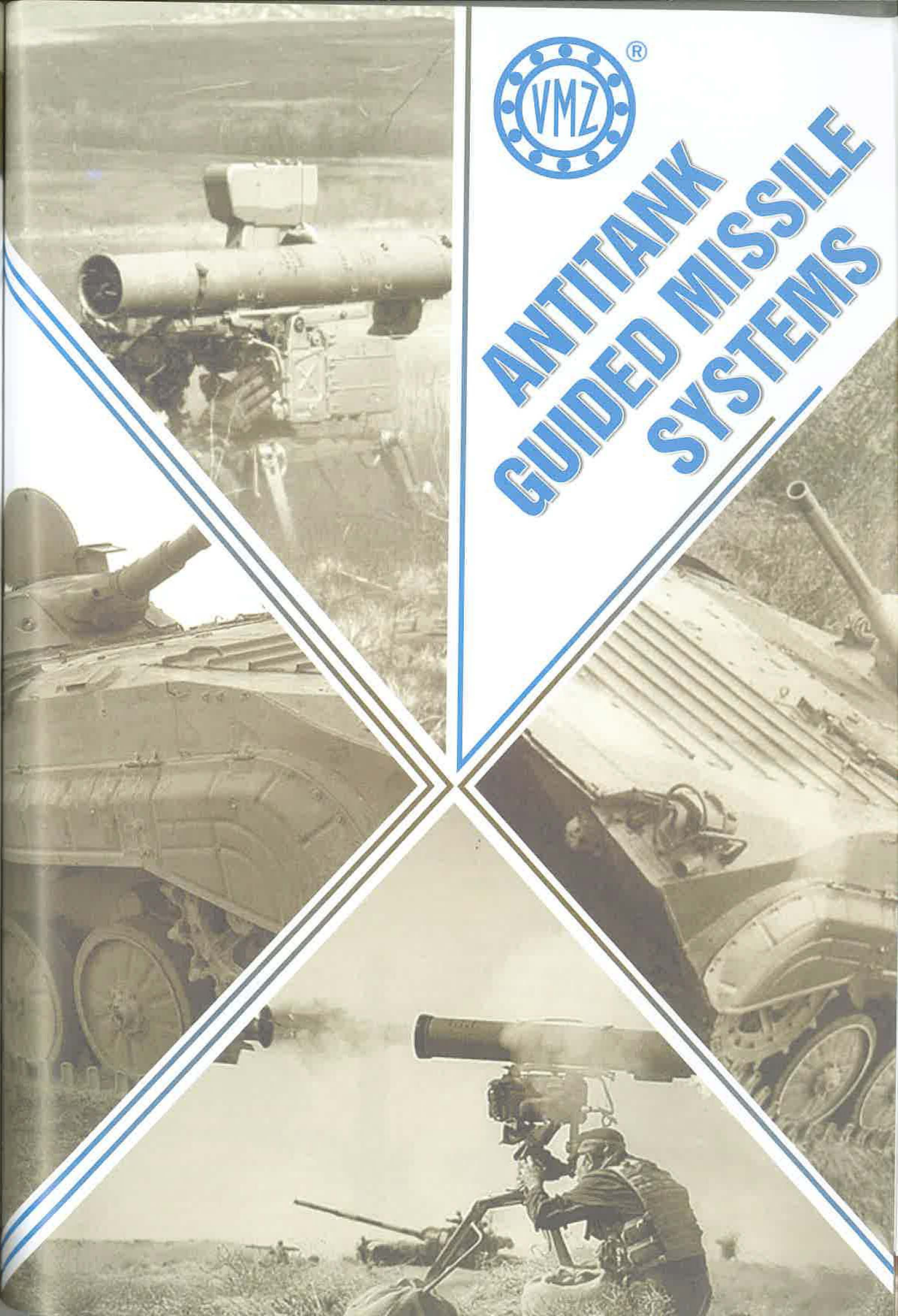
25







# ANTITANK GUIDED MISSILE SYSTEMS





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## 9M111-2 FAGOT ANTI-TANK GUIDED MISSILE

NSN: 1315-50-0012406

It is designed for destroying visual moving and stationary armoured targets, as well as other targets on the ground. The missile included in the 9K111 system is an effective weapon for all seasons, in any type of climatic and weather conditions, including the conditions of dry and wet tropical climate and mountain areas. It can be launched at dawn and in twilight, and during the night with the help of artificial illumination of the area by means of standard military illumination devices. Two missiles in containers are placed in one bag. They are water-tight, with good floatability, and are good for river crossing. The missiles are fired from a portable launching unit. In guiding the missile, the task of the gunner is to keep the sight of the launching unit at the target.

### CHARACTERISTICS

Missile caliber, mm	120
Missile weight, kg	13
Effective range, m	Minimum 70 Maximum 2000
Average flight speed, m/s	186
Armour penetration, mm	400
Fire rate, rds/min	3
Safe operational temperature range, °C	-50...50
Guidance system	Wire-guided

### PACKING

Dimensions, mm	1260x478x322
2 missiles in a case	
Gross weight, kg	57







## 9M111-M FAKTORIA ANTI-TANK GUIDED MISSILE

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

### CHARACTERISTICS

Missile caliber, mm	120
Missile weight, kg	12,900
Effective range, m	Minimum 75 Maximum 2500
Average flight speed, m/s	180
Armour penetration, mm	460
Fire rate, rds/min	3
Safe operational temperature range, °C	-50...50
Guidance system	Semi-automatic, wire-guided



### PACKING

Dimensions, mm	1260x478x322
2 missiles in a case	
Gross weight, kg	57,500





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## 9M113 KONKURS ANTI-TANK GUIDED MISSILE

**NSN : 1410-50-001-5879**

It is designed for destroying visual moving and stationary armoured targets, as well as other targets on the ground. The missile included in the 9K111 system is an effective weapon for all seasons, in any type of climatic and weather conditions, including the conditions of dry and wet tropical climate and mountain areas. It can be launched at dawn and in twilight, and during the night with the help of artificial illumination of the area by means of standard military illumination devices. The missiles in containers are water-tight, with good floatability, and are good for river crossing. The missiles are fired from a portable launching unit. In guiding the missile, the task of the gunner is to keep the sight of the launching unit at the target.

### CHARACTERISTICS

Missile caliber, mm	135
Missile weight, kg	25,160
Effective range, m	Minimum 75 Maximum 4000
Average flight speed, m/s	208
Armour penetration, mm	600
Fire rate, rds/min	3
Safe operational temperature range, °C	-50...50
Guidance system	Semi-automatic, wire-guided



### PACKING

Dimensions, mm	1390x272x353
1 missile in a case	
Gross weight, kg	47,900







## 9M115M METIS ANTI-TANK GUIDED MISSILE

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NSN: 1315-50-0012407

It is designed for destroying visible moving and stationary armoured targets, as well as other targets on the ground. The missile in the 9K115 system is an effective weapon in all seasons, in any type of climatic and weather conditions, including the conditions of dry and wet tropical climate and mountain regions.

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.

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.

### CHARACTERISTICS

Missile caliber, mm	93
Missile weight, kg	6
Effective range, m	Minimum 40 Maximum 1000
Average flight speed, m/s	180
Armour penetration, mm	460
Fire rate, rds/min	4
Safe operational temperature range, °C	-50...50
Guidance system	Semi-automatic, wire-guided



### PACKING

Dimensions, mm	930x380x436
4 missiles in a case	
Gross weight, kg	45







# ROCKET GRENADES WITH DISPOSABLE GRENADE LAUNCHERS







**BULSPIKE-AP**  
**DISPOSABLE ROCKET GRENADE**  
**LAUNCHER WITH OG-22M**  
**ANTI-PERSONNEL GRENADE**

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**NSN : 1330-50-001-5854**



The BULSPIKE-AP round is intended for destruction of enemy manpower located in the open, in trenches, in field-type shelters, as well for destruction of unarmored and light armoured enemy equipment.

**CHARACTERISTICS**

Caliber, mm	72,50
Number of fragments, pcs./kg.	1060/0,424
Direct fire range, m	100
Maximum distance, m	500
Round weight, kg	4,00
Grenade weight, kg	2,00
Length in carry-on and deploy state, m	0,765
Safe operational temperature range, °C	-40...+50
Deployment time, s	8...10

**PACKING**

Dimensions, mm	847x688x364
5 rounds in a case	
Gross weight, kg	47

**Static test :**

**Metal sheet with dimensions**

**Width 1000 mm**

**Height 2000 mm**

**The metal sheet is placed at 5-7 m radius  
from the exact point of the burst of warhead**

**Approximate number of fragments, pcs. 108**





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## BULSPIKE-AT DISPOSABLE ROCKET GRENADE LAUNCHER WITH PG-22 ANTI-TANK GRENADE

NSN : 1330-50-001-5855

The BULSPIKE-AT round is intended for destruction of tanks, self-propelled guns and other motorized an armoured vehicles, as well as against the enemy manpower located in bunkers, field shelters and urban-type brick-wall fortifications.



### CHARACTERISTICS

Caliber, mm	72,50
Round weight, kg	3,48
Grenade weight, kg	1,48
Armour penetration, mm	400
Muzzle velocity, m/s	133
Direct fire range, m	150
Sighting range maximum, m	300
Safe operational temperature range, °C	-40...+50
Deployment time, s	8...10

### PACKING

Dimensions, mm	847x688x364
5 rounds in a case	
Gross weight, kg	43







**BULSPIKE-TB**  
**DISPOSABLE ROCKET GRENADE**  
**LAUNCHER WITH TB-22M**  
**THERMOBARIC GRENADE**

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**NSN : 1330-50-001-5853**

BULSPIKE-TB round with thermobaric warhead is intended for effective destruction of manpower and fire units located in the open, in trenches and field-type shelters, log-end-earth firing positions (including the cases when the grenade hits at 2m. from the target), as well as for destruction of light-armored and unarmored equipment.

**CHARACTERISTICS**

Caliber, mm	72,5
Weight of thermobaric mixture, g	700
Weight of explosive charge, g	85
Direct fire range, m	100
Maximum distance, min, m	500
Round weight, kg	4,00
Grenade weight, kg	2,00
PTBS weight, kg	0,705
Length in carry-on and deployed state /m/	0,78
Safe operational temperature range, °C	-40...+50
Deployment time, s	8...10

**PACKING**

Dimensions, mm	847x688x364
5 rounds in a case	
Gross weight, kg	47





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**RPG-22**  
**ROCKET ANTI-TANK ROUND**  
**WITH PG-22 ANTI-TANK GRENADE**

**NSN: 1330-50-0001554**

The RPG-22 rocket anti-tank grenade is a disposable individual weapon and is used against tanks, self-propelled guns and other armoured vehicles of the enemy, as well as against the enemy troops in the open, in bunkers, light field shelters and urban-type brick-wall fortifications.



**CHARACTERISTICS**

Caliber, mm	72,50
Rocket anti-tank grenade weight, kg	2,700
Grenade weight, kg	1,480
Armour penetration, mm	400
Muzzle velocity, m/s	133
Direct fire range, m	150
Safe operational temperature range, °C	-40...+50
Deployment time, s	8...10

**PACKING**

Dimensions, mm	860x688x364
8 rounds in a case	
Gross weight, kg	48







# AVIATION UNGUIDED ROCKETS





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## S-5KP UNGUIDED AIRCRAFT ROCKET

NSN: 1310-50-0001552



The S-5KP rocket is with a hollow-charge fragmentation effect and is designed for destroying ground armoured and unarmoured targets, such as tanks, self-propelled artillery, APCs, missile launchers, landed aircraft, etc., as well as manpower of the enemy.

### CHARACTERISTICS

Caliber, mm	57
Rocket weight, kg	5,000
Muzzle velocity, m/s	32...53
Max. inherent velocity, m/s	500
Casualty-producing fragments 2g in size, pcs.	290...310
Armour penetration, mm	250
Circular error probable, mils of distance:	
- from an aircraft	≤3
- from a helicopter	≤10
Operational temperature range, °C	-60...50

### SYSTEM

UB-16, UB-32 universal launcher pods  
and their modifications

### PACKING

Dimensions, mm	1187x368x247
8 rockets in a case	
Gross weight, kg	55







## **S-5KP PRACT UNGUIDED AIRCRAFT ROCKET**

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**NSN: 1310-50-0012409**



The S-5KP PRACT unguided aircraft rocket is designed for training the personnel using S-5K, S-5M, S-5MO, S-5KO, S-5KPB rockets. There is no hollow-charge effect when firing S-5KP PRACT rockets, and the high-explosive and fragmentation effect is reduced about 12 times. Hits are marked by flash, which has increased intensity compared to the live rocket, and smoke. It is possible to fire the rocket in the day-time or night-time under the same conditions used for live rockets.

### **CHARACTERISTICS**

Caliber, mm	57
Rocket weight, kg	5,000
Muzzle velocity, m/s	32...53
Max. inherent velocity, m/s	500
Circular error probable, mils of distance:	
- from an aircraft	≤3
- from a helicopter	≤10
Operational temperature range, °C	-60...50

### **SYSTEM**

UB-16, UB-32 universal launcher pods  
and their modifications

### **PACKING**

Dimensions, mm	1187x368x247
8 rockets in a case	
Gross weight, kg	55





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## S-5KO UNGUIDED AIRCRAFT ROCKET

NSN: 1310-50-0001551



The S-5KO rocket is with a hollow-charge fragmentation effect and is designed for destroying ground armoured and unarmoured targets, such as tanks, self-propelled artillery, APCs, missile launchers, landed aircraft, etc., as well as manpower of the enemy.

### CHARACTERISTICS

Caliber, mm	57
Rocket weight, kg	4,500...4,700
Muzzle velocity, m/s	44,5
Max. inherent velocity, m/s	586
Casualty-producing fragments 2g in size, pcs.	200...220
Armour penetration, mm	172
Circular error probable, mils of distance:	
- from an aircraft	≤2
- from a helicopter	≤8
Operational temperature range, °C	-60...50

### SYSTEM

UB-16, UB-32 universal launcher pods and their modifications

### PACKING

Dimensions, mm	1140x368x251
8 rockets in a case	
Gross weight, kg	53







## S-5KO PRACT UNGUIDED AIRCRAFT ROCKET

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NSN: 1310-50-0001550



The S-5KO PRACT unguided aircraft rocket is designed for training the personnel using S-5K, S-5M, S-5MO, S-5KO rockets. There is no hollow-charge effect when firing S-5KO PRACT rockets, and the high-explosive and fragmentation effect is reduced about 12 times. Hits are marked by flash, which has increased intensity compared to the live rocket, and smoke. It is possible to fire the rocket in the day-time or night-time under the same conditions used for live rockets.

### CHARACTERISTICS

Caliber, mm	57
Rocket weight, kg	4,500...4,700
Muzzle velocity, m/s	44,5
Max. inherent velocity, m/s	586
Circular error probable, mils of distance:	
- from an aircraft	≤2
- from a helicopter	≤8
Operational temperature range, °C	-60...50

### SYSTEM

UB-16, UB-32 universal launcher pods  
and their modifications

### PACKING

Dimensions, mm	1140x368x251
8 rockets in a case	
Gross weight, kg	53





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## S-5MO UNGUIDED AIRCRAFT ROCKET

NSN: 1310-50-0001547



The S-5MO rocket is designed for destroying ground light armoured and unarmoured targets as well as manpower of the enemy.

### CHARACTERISTICS

Caliber, mm	57
Rocket weight, kg	4,850
Muzzle velocity, m/s	44,5
Max. inherent velocity, m/s	543
Casualty-producing fragments 2g in size, pcs.	360...380
Circular error probable, mils of distance:	
- from an aircraft	≤ 3
- from a helicopter	≤ 8
Operational temperature range, °C	-60...50

### SYSTEM

UB-16, UB-32 universal launcher pods  
and their modifications

### PACKING

Dimensions, mm	1140x368x251
8 rockets in a case	
Gross weight, kg	53







## S-8KOM

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## UNGUIDED AIRCRAFT ROCKET

NSN: 1315-50-0001549



The S-8KOM unguided aircraft rocket is with a hollow-charge fragmentation warhead and is designed for destruction of ground armoured and unarmoured targets, such as tanks, APCs, missile launchers, radiolocation stations and others, as well as enemy troops.

### CHARACTERISTICS

Caliber, mm	80
Rocket weight, kg	11,300
Muzzle velocity, m/s	55...75
Max. inherent velocity, m/s	600
Armour penetration, mm	400
Casualty-producing fragments 3g in size, pcs.	400
Circular error probable, mils of distance:	
- from an aircraft	≤3
- from a helicopter	≤8
Safe operational temperature range, °C	-60...60

### SYSTEM

B8, B8M, B8M1, B80, B8S7 launcher pods for aircraft,  
B8V20A, B8V7 launcher pods for helicopters, and their modifications

### PACKING

Dimensions, mm	1785x315x302
4 rockets in a case	
Gross weight, kg	68





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## UAR-57TB1 UNGUIDED AIRCRAFT ROCKET

NSN: 1340-50-0012408



It is suitable for destroying enemy manpower located in the open, in entrenchments, field shelters, stone, brick or concrete buildings, light armoured and unarmoured vehicles, missile launchers, radiolocation stations, landed aircraft and others.

### CHARACTERISTICS

Caliber, mm	57
Max. inherent velocity, m/s	580
Thermobaric mixture, kg	min 0,980
Fuze	V-5K
Safe operational temperature range, °C	-60...50

### SYSTEM

UB-16, UB-32 launcher pods and their modifications

### PACKING

Dimensions, mm	1187x368x247
8 rockets in a case	
Gross weight, kg	55
Volume, m <sup>3</sup>	0,107







## **UAR-80VMZ UNGUIDED AIRCRAFT ROCKET**

**NSN: 1340-50-0011826**



The UAR-80VMZ unguided aircraft rocket with a hollow-charge fragmentation warhead is used against ground armoured and unarmoured targets, such as tanks, APCs, missile launchers, radiolocation stations and others, as well as enemy troops.

### **CHARACTERISTICS**

Caliber, mm	80
Rocket weight, kg	11,300
Muzzle inherent velocity, m/s	55...75
Maximum inherent velocity of rocket, m/s	600
Armour penetration, mm	400
Casualty-producing fragments 3g in size, pcs.	400
Circular error probable, mils of distance:	
- from an aircraft	≤3
- from a helicopter	≤8
Safe operational temperature range, °C	-60...60

### **SYSTEM**

B8, B8M, B8M1, B80, B8S7 launcher pods for aircraft,  
B8V20A, B8V7 launcher pods for helicopters, and their modifications

### **PACKING**

Dimensions, mm	1785x315x302
4 rockets in a case	
Gross weight, kg	68





## UAR-80VMZ PRACT UNGUIDED AIRCRAFT ROCKET

NSN : 1340-50-001-2401



The UAR-80VMZ PRACT unguided aircraft rocket is designed for training the personnel using UAR-80VMZ, S-8KO, S-8KOM rockets. There is no hollow-charge effect when firing UAR-80VMZ PRACT rockets, and the high-explosive and fragmentation effect is reduced about 12 times. Hits are marked by flash, which has increased intensity compared to the live rocket, and smoke. It is possible to fire the rocket in the day-time or night-time under the same conditions used for live rockets.

### CHARACTERISTICS

Caliber, mm	80
Rocket weight, kg	11,300
Muzzle inherent velocity, m/s	55...75
Maximum inherent velocity of rocket, m/s	600
Circular error probable, mils of distance:	
- from an aircraft	≤3
- from a helicopter	<8
Safe operational temperature range, °C	-60...60

### SYSTEM

B8, B8M, B8M1, B80, B8S7 launcher pods for aircraft,  
B8V20A, B8V7 launcher pods for helicopters, and their modifications

### PACKING

Dimensions, mm	1785x315x302
4 rockets in a case	
Gross weight, kg	68







## UAR-80TB UNGUIDED AIRCRAFT ROCKET

The UAR-80TB unguided aircraft rocket is intended for use against different types of targets located in pits, trenches, defiles, caves and other shelters, and against enemy personnel as well. The rocket's warhead is filled with a fuel-air detonating mixture. The rocket part's design is the same as that of the S-8KOM rocket.

The rocket is fitted with a FTM-1 fuze. The fuze is a base piezoelectric type.

Fire is delivered from B-8M1; B-8V20A; B-8V7 types launcher pods carried on aircraft and helicopters.

Aircraft: Su-24; Su-25; Su-27; Su-27K; MiG-27; MiG-29.

Helicopters: Mi-8; Mi-24; Mi-28; Ka-252; Ka-50.

### CHARACTERISTICS

Caliber, mm	80
Rocket length, mm	1670
Weight of rocket, kg	11,600
Weight of warhead, kg	3,800 (4,000)
Weight of mixture, kg	2,400
Release range, m	1300-4000 (1500-3500)
Combat effectiveness	6 – 7 kg TNT equivalent
Rocket velocity, m/s	590
Operational temperature range, °C	-60...+60
Time of powered flight, s	0,5-1,2
Aircraft speed range on rocket's operational use, m/s	166-330

### WARHEAD DESIGN

**Body** – basic component integrating all warhead components and accommodating an explosive charge.

The body represents a thin-wall tube made of aluminium alloy.

A fairing is screwed to the body to seal hermetically the warhead and create the streamlined form required to ensure a stable flight. To the warhead's rear is screwed the base piezoelectric fuze transmitting a detonation pulse to an intermediate booster.

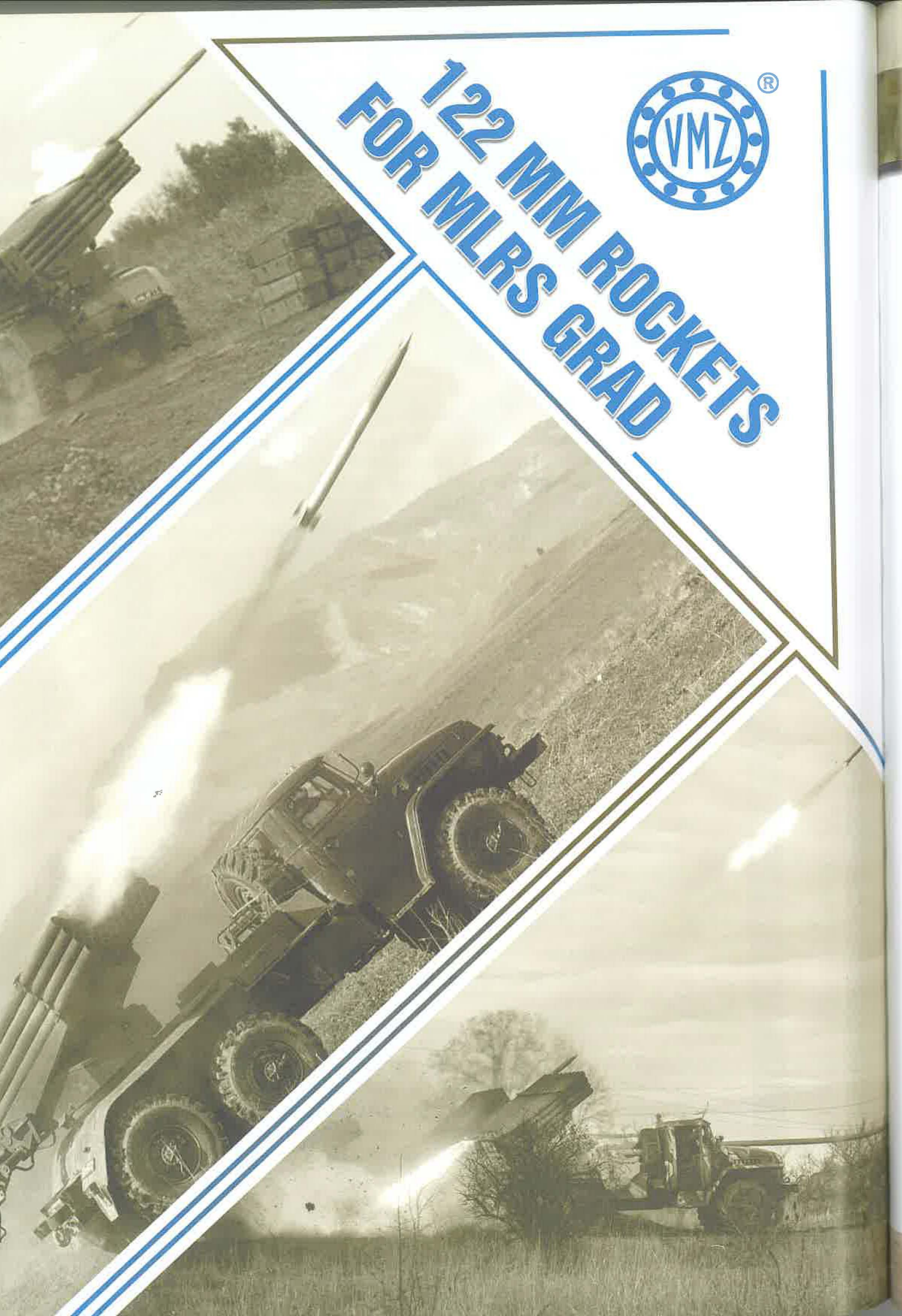
**Explosive charge** – represents a polymer-bonded solid mixture serving for fuel-air detonation.

**Pressing sleeve** – made of aluminum alloy; serves together with a cardboard ring and cardboard pads to fix the intermediate booster in the body.





# 122 MM ROCKETS FOR MLRS GRAD







## 122 mm M-21OF ROCKET

NSN: 1315-50-0012411



The 122 mm rocket is designed for destroying mortars, field and rocket artillery and motorized units, defeating manpower and enemy firepower in entrenchments and trenches, destroying communication lines, strongpoints and field defense constructions, making passages in defense wirings and outlook posts, destroying enemy's back areas (railway junctions, headquarters, concentrated military forces) and large-area simultaneous destruction of group targets through volley fire.

### CHARACTERISTICS

Weight of rocket, kg	66,180
Maximum range, m	20127
Maximum velocity, m/s	690
Spoiler rings	Small and big one
Damage area per rocket, m <sup>2</sup> :	
- one round against manpower, m2	708
- one round against unarmoured vehicles, m2	610
- one round against light armoured vehicles, m2	513
Safe operational temperature range, °C	-40...50

### SYSTEM

BM-21 "GRAD" Multiple-Launch Rocket System

### PACKING

Dimensions, mm	2807x280x252
1 rocket in a case	
Gross weight, kg	100





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## 122 mm M-21OF-M ROCKET

NSN: 1315-50-0012412



The 122 mm rocket with prefabricated fragments is designed for destroying mortars, field and rocket artillery and motorized units, defeating manpower and enemy firepower in entrenchments and trenches, destroying communication lines, strongpoints and field defense constructions, making passages in defense wirings and outlook posts, destroying enemy's back areas (railway junctions, headquarters, concentrated military forces) and large-area simultaneous destruction of group targets through volley fire.

### CHARACTERISTICS

Weight of rocket, kg	66,180
Maximum range, m	20127
Maximum velocity, m/s	690
Spoiler rings	Small and big one
Damage area per rocket, m <sup>2</sup> :	
- one round against manpower, m2	750
- one round against unarmoured vehicles, m2	685
- one round against light armoured vehicles, m2	605
Safe operational temperature range, °C	-40...50

### SYSTEM

BM-21 "GRAD" Multiple-Launch Rocket System

### PACKING

Dimensions, mm	2807x280x252
1 rocket in a case	
Gross weight, kg	100







## 122 mm M-21OF-40 ROCKET



The 122 mm rocket is designed for destroying mortars, field and rocket artillery and motorized units, defeating manpower and enemy firepower in entrenchments and trenches, destroying communication lines, strongpoints and field defense constructions, making passages in defense wirings and outlook posts, destroying enemy's back areas (railway junctions, headquarters, concentrated military forces) and large-area simultaneous destruction of group targets through volley fire.

### CHARACTERISTICS

Weight of rocket, kg	69,0
Maximum range, m	40200
Maximum velocity, m/s	1100
Spoiler rings	Small and big one
Damage area per rocket, m <sup>2</sup> :	3600
Safe operational temperature range, °C	-30...50

### SYSTEM

BM-21 "GRAD" and RM-70 Multiple-Launch Rocket System or similar existing launchers.

### PACKING

1 rocket in a case





## AIR TARGET IMITATOR

NSN: 6920-50-0007012



The air target imitators (ATI) are targets imitating the flight of a piston-engined or jet-propelled air target, emitting energy in the infrared wave band.

### CHARACTERISTICS

Caliber, mm	131
ATI weight, kg	40,5
Flight speed alteration, m/s	from 280 to 180
Maximum flight range, m	up to 4800
Maximum flight altitude, m	up to 1100
Maximum speed in the crossing point, m/s	208
IR radiation source	6 flares imitating IR radiation mounted in flare-holders fitted to the imitator's stabilizer fin
Visibility of flares, km	Ensures interception of ATI
Standby period between first and consecutive launch, min	20
Safe operational temperature range, °C	-40...50

### SYSTEM

BM-13N Multiple-Launch Rocket System (guide length 4000 mm), or  
BM-13 (guide length 5000 mm)

### PACKING

Dimensions, mm	1827x570x327
2 rockets in a case	
Gross weight, kg	126







# FUZES





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## DZV-90 TIME FUZE

NSN: 1390-50-0011823

The time fuze is intended for use on the 122 mm and 152 mm artillery rounds for firing respectively from D-30, M-30, 2S1 and D-20, ML-20, 2S3. The time fuze provides initiation of the warhead at a preset time.



### CHARACTERISTICS

Type	Mechanical
Fuze weight, kg	0,348
Time setting range, s	2...90
Time setting increments, s	0,2
Timing mechanism error, %	Up to 1,1
Nonfailure probability	≥0,98
Safe drop height, m	3
Fixing thread	Sp 36, 18x10 turns in 1"
Safe operational temperature range, °C	-40...50

### PACKING

40 pieces in 4 moisture-proof metal boxes, placed in a wooden case

Dimensions, mm	520x490x170
Gross weight, kg	31







## **ETD TIME FUZE**

The ETD is a fuze with wireless input of the time of delay.

It is designed to be used on mortar rounds of calibers 60 mm, 81 mm, 82 mm and 120 mm in smoke and illumination applications.

The preset time of delay can range from 2 up to 99.9 s (in 0.1 s increments).

Its value is saved in a read-only memory, which is capable of multiple reprogramming.

The programmer has a LED display for visualizing the time of delay, and a light-emitting diode to indicate the successful memorizing.

A contact impact action and a time of self-destruction are provided for self-destruction.

In accordance with STANAG 4187, an inertial mechanism and a linear acceleration sensor provide arming at a safe distance.



### **CHARACTERISTICS**

Arming distance, m

Weight of fuze, kg

Safe operational temperature range, C°

Shelf life, years

> 70

0,315 ± 0,030

-40...+55

10





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## GO-2 FUZE

NSN: 1390-50-0012419

The GO-2 fuze is intended for use on HE-FRAG grenades OFG-7, OG-9M, OG-9MZ for firing respectively from the RPG-7V, SPG-9M and 2A28 gun, mounted on the BMP-1, and serves to ensure the safety during handling and firing and to detonate the warhead upon impact with a target. The fuze is nose, impact with instantaneous and inertial action, non-boresafe type.



### CHARACTERISTICS

Type	Mechanical
Weight, kg	0,204
Arming distance, m	2,5÷ 30
Safe drop height, m	3
Fixing thread	SP 36,18x10 turns in 1"
Safe operational temperature range, °C	-40...50







## O-4M FUZE

NSN: 1390-50-0012418



The O-4M fuze is intended for use on 82 mm fragmentation mortar bombs fired from the BM82, 2B14, and for use on the OG-7 fragmentation grenade for the RPG-7V. It serves to detonate the warhead on impact with the target. The fuze is a nose impact type with two settings – for instantaneous (fragmentation) and inertial (HE) action, semi-boresafe, with distant arming.

### CHARACTERISTICS

Type	Mechanical
Weight, kg	0,183
Arming distance, m	
- with OG-7 grenade	$\geq 3 \dots 25$
- with mortar bomb	$\geq 3$
Safe drop height, m	
- in a mortar bomb	2,5
- in a grenade	2
Fixing thread	Sp 36,18 x 10 turns in 1"
Safe operational temperature range, °C	-40...50





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## O-4M1 FUZE

NSN : 1390-50-001-5874

The O-4M1 fuze is intended for use on the 60 mm HE-FRAG mortar bomb. It serves to detonate the warhead on impact with a target. The O-4M1 fuze is a nose impact type with two settings – for instantaneous (fragmentation) and inertial (HE) action, semi-boresafe with distant arming.



### CHARACTERISTICS

Type	Mechanical
Weight, kg	0,183
Arming distance, m	$\geq 3$
Safe drop height, m	2,5
Fixing thread	1,5" - 12UNE - 1A
Safe operational temperature range, °C	-40...50







## O-4N FUZE

**NSN : 1390-50-001-5868**

The O-4N fuze is intended for use on OG-7, OG-9 fragmentation grenades, and 60 mm, 81 mm and 82 mm mortar bombs.

This fuze is a nose impact type with two settings – for instantaneous (fragmentation) and inertial (HE) action, with distant arming and a semi-boresafe explosive train.

A design element is introduced for manual activation of the fuze safety feature with a view to increase the safety in handling – during transportation, loading-unloading operations, after accidental dropping, and during airborne landing up to the moment of firing the ammunition.

The O-4N fuze coming with ammunition packed in cases, is safe in handling, during transportation and after accidental dropping from a height of 12 m in any orientation.



### CHARACTERISTICS

Type

Weight of fuze, kg

Safety arming distance, m

- in a grenade

- in a mortar bomb

Fixing thread, mm

Safe operational temperature range, C°

Mechanical

0,185

from 3 up to 25

≥3

Sp 36,18x10 tpi

-40...+50





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## V-5K FUZE

NSN: 1390-50-0012420



The V-5K fuze is intended for use on the S-5K, S-5KO, S-5MO and UAR-57TB unguided aircraft rockets. It serves to ensure their safety during handling and firing and to detonate the rocket's warhead on impact with a target. The fuze is nose, impact with instantaneous and inertial action, non-boresafe type.

### CHARACTERISTICS

Type	Mechanical
Weight, kg	0,168
Arming distance, m	≥110
Safe drop height, m	3
Fixing thread	Sp 36,18 x 10 turns in 1"
Safe operational temperature range, °C	-60...50

### PACKING

64 fuzes in 4 moisture-proof metal boxes in a wooden case	
Dimensions, mm	520x490x170
Gross weight, kg	24







## V-5KP FUZE

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NSN: 1390-50-0012422

It serves to detonate the charge of the warhead fitted to S-5KP unguided aircraft rockets. The fuze is piezoelectric, nose-base, with percussion-instantaneous and inertial action and distant arming, boresafe type. It is composed of two parts – piezoelectric generator and safety and actuating mechanism.



### CHARACTERISTICS

Type

Piezoelectric

Weight, kg

- piezoelectric generator
- base part

0,040

0,130

Delayed arming time, s

1,1 ÷ 1,7

Safe drop height, m

3

Safe operational temperature range, °C

-60...60

Actuation angle

0°...75°





## V-5KP1 FUZE

NSN: 1390-50-0012423

It is designed to detonate the charge of the warhead of S-8KO and UAR-80VMZ unguided aircraft rockets. The fuze is piezoelectric, nose-base, with percussion-instantaneous and inertial action, distant arming, boresafe type. It is composed of two parts – piezoelectric generator and safety and actuating mechanism.



### CHARACTERISTICS

Type

Piezoelectric

Weight, kg

- piezoelectric generator

0,040

- base part

0,130

Actuation angle

0°...75°

Distant arming time, s

1,1 ÷ 1,7

Safe drop height, m

3

Safe operational temperature range, °C

-60...60







## V-RM FUZE

**NSN : 1390-50-001-5872**

The V-RM fuze is intended for use on 120 mm mortar bombs.  
This fuze is a nose impact type with three settings – for instantaneous (fragmentation), inertial (HE), and delay action, with distant arming and a boresafe explosive train.

A design element is introduced for manual activation of the fuze safety feature with a view to increase the safety in handling – during transportation, loading-unloading operations, after accidental dropping, and during airborne landing up to the moment of firing the ammunition.

The V-RM fuze coming with ammunition packed in cases, is safe in handling, during transportation and after accidental dropping from a height of 12 m in any orientation.



### CHARACTERISTICS

Type

Weight of fuze, kg

Safety arming distance, m

Fixing thread, mm

Safe operational temperature range, C°

Mechanical

0,440

3

Sp 36,18x10 tpi

-40...+50





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## V-15 FUZE

NSN: 1390-50-0012428

The V-15 fuze is intended for use on 122mm and 125mm anti-tank projectiles for firing respectively from D-30 howitzer, D-81 tank gun, and serves to detonate the warhead on impact with the target. The V-15 fuze is composed of two parts – nose part and base part. It is a piezoelectric, percussion-instantaneous, boresafe type.



### CHARACTERISTICS

Type

Piezoelectric

Weight, kg

- piezoelectric generator

0,0882

- base part

0,170

Actuation angle

0°...60°

Arming distance, m

2,5 ± 40

Safe drop height, m

3

Safe operational temperature range, °C

-40...50







## **VD-1 FUZE**

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**NSN: 1390-50-0012421**

The VD-1 fuze is intended for use on GTB-7VS, GTB-7VM thermobaric grenades for the RPG-7V grenade launcher and serves to ensure their safety during handling and firing and to detonate the warhead upon impact with a target. The fuze is base, impact with inertial action, boresafe type.



### **CHARACTERISTICS**

Type	Mechanical
Weight, kg	0,080
Arming distance, m	$\geq 2,5 \dots 15$
Distant arming time, s	0,020...0,114
Safe drop height, m	3
Safe operational temperature range, °C	-40...50





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## VD-1A FUZE

NSN : 1390-50-001-5873

The VD-1A fuze is intended for use on ROG-22, ARMBLAST-AP, ARMBLAST-TB, DREBG-73 grenades. It serves to ensure their safety during handling and firing and to detonate the warhead upon impact with a target.

The fuze is base, impact with inertial action, boresafe type.



### CHARACTERISTICS

Type	Mechanical
Weight, kg	0,080
Arming distance, m	$\geq 2,5 \dots 15$
Distant arming time, s	0,020...0,114
Safe drop height, m	3
Safe operational temperature range, °C	-40...50







## VP-7M FUZE

NSN: 1390-50-0012425

The fuze is a piezoelectric, nose-base type with percussion-instantaneous action, distant arming and a self-destruction mechanism. It is intended for use on PG-7 anti-tank grenades for the RPG-7V portable antitank grenade launcher. It serves to detonate the warhead on impact with the target.

The fuze is composed of two parts – nose part (piezoelectric generator) and base part – safety and detonating mechanism.

### CHARACTERISTICS

Type	Piezoelectric
Weight, kg	
- piezoelectric generator	0,052
- base part	0,060
Actuation angle	0°...60°
Self-destruction time, s	3,5...8
Arming distance, m	2,5...15
Safe drop height, m	3
Safe operational temperature range, °C	-50...50





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## VP-9M FUZE

NSN: 1390-50-0012424

The fuze is a piezoelectric, nose-base type with percussion-instantaneous action, distant arming and a self-destruction mechanism. It is intended for use on PG-9 anti-tank grenades for the SPG-9M heavy anti-tank grenade launcher and 2A28 gun, mounted on the BMP-1. It serves to detonate the warhead on impact with the target. The fuze is composed of two parts - nose part (piezoelectric generator) and base part - safety and detonating mechanism.



### CHARACTERISTICS

Type	Piezoelectric
Weight, kg	
- piezoelectric generator	0,052
- base part	0,060
Actuation angle	0°...60°
Self-destruction time, s	3,5...8
Arming distance, m	2,5...20
Safe drop height, m	3
Safe operational temperature range, °C	-50...50



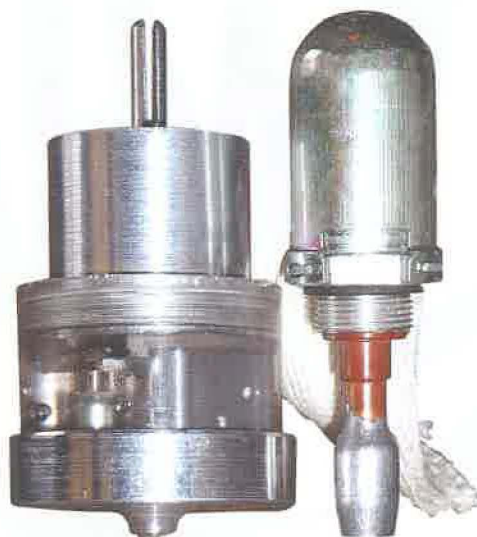




## VP-22 FUZE

NSN: 1390-50-0012426

It is intended for use on anti-tank grenades for the RPG-7V portable anti-tank grenade launcher, SPG-9M heavy anti-tank grenade launcher, 2A28 gun and RPG-22 rocket anti-tank grenade. It serves to detonate the warhead on impact with the target. The fuze is a nose-base, piezoelectric, percussion-instantaneous boresafe type with distant arming and a self-destruction mechanism.



### CHARACTERISTICS

Type	Piezoelectric
Weight, kg	
- piezoelectric generator	0,015
- base part	0,060
Actuation angle	0°...75°
Self-destruction time, s	3,5÷8
Safe drop height, m	3
Safe operational temperature range, °C	-50...50





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## **VPZ-9M PYRODELAY ELEMENT**

**NSN : 1390-50-001-5867**

The VPZ-9M pyrodelay element is designed for transmitting a pulse for initiating the grenade's rocket motor at a safe distance from the SPG-9M heavy grenade launcher's muzzle end face.



### **CHARACTERISTICS**

Weight of pyrodelay element, g  
Body diameter, mm  
Height, mm  
Fixing thread  
Delay element burn time, s  
Safe operational temperature range, °C

35  
Ø 8,8  
44,6  
M45x1,5  
0,023 ÷ 0,050  
-40...50







## RGM-2M FUZE

**NSN : 1390-50-000-0456**

Purpose – RGM-2M fuze is nose, impact, boresafe type with three settings – instantaneous, inertial and delayed action.

It is used to complete 122mm howitzer, high-explosive fragmentation, incendiary, smoke projectiles and 152mm fragmentation and high-explosive fragmentation projectiles.



### CHARACTERISTICS

Type	Mechanical
Weight of fuze, kg	0,438
Arming distance on setting "Z" ("3"), m	100...150
Delay time on setting "Z" ("3"), s	0,027 to 0,063
Safe operational temperature range, C°	-40...+50
Overall and coupling dimensions:	
Threaded joint, mm	Special 36,18x10 windings
Detonator diameter, mm	Ø32max
Length, mm	102,52 to 105,71





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## **KV-U PERCUSSION PRIMER**

**NSN : 1390-50-001-5869**

KV-U percussion primer is intended for burn initiation of the propellant charge of artillery projectiles with caliber 100mm, 122mm, 130mm and 152mm for artillery systems and howitzers.



### **CHARACTERISTICS**

Coupling dimensions:

Length, mm

23,8

Diameter, mm max

Ø30

Thread

Special D 27,178x14 windings in 1" class 2

Weight, kg

0,086

Safe operational temperature range, C°

-40...+50







## **ZV-7G PYRODELAY ELEMENT**

**NSN : 1390-50-001-5864**

The ZV-7G pyrodelay element is designed for transmitting a pulse for initiating the grenade's rocket motor at a safe distance from the RPG-7V grenade launcher's muzzle end face.



### **CHARACTERISTICS**

Weight of pyrodelay element, g	30
Diameter of pellet, mm	Ø23,5
Diameter of body, mm	Ø10
Height, mm	56
Fixing thread	M 12x1
Delay element burn time, s	0,090-0,125
Safe operational temperature range, °C	-40...50





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## **ZV-7L PYRODELAY ELEMENT**

**NSN : 1390-50-001-5866**

The ZV-7L pyrodelay element is designed for transmitting a pulse for initiating the grenade's rocket motor at a safe distance from the RPG-7V grenade launcher's muzzle end face.



### **CHARACTERISTICS**

Weight of product, g	30
Diameter of pellet, mm	Ø23,50
Diameter of body, mm	Ø10
Height, mm	56
Fixing thread	M12x1
Delay element burn time, s	0,120-0,170
Safe operational temperature range, °C	-40...50







## **ZV-70 PYRODELAY ELEMENT**

**NSN : 1390-50-001-5865**

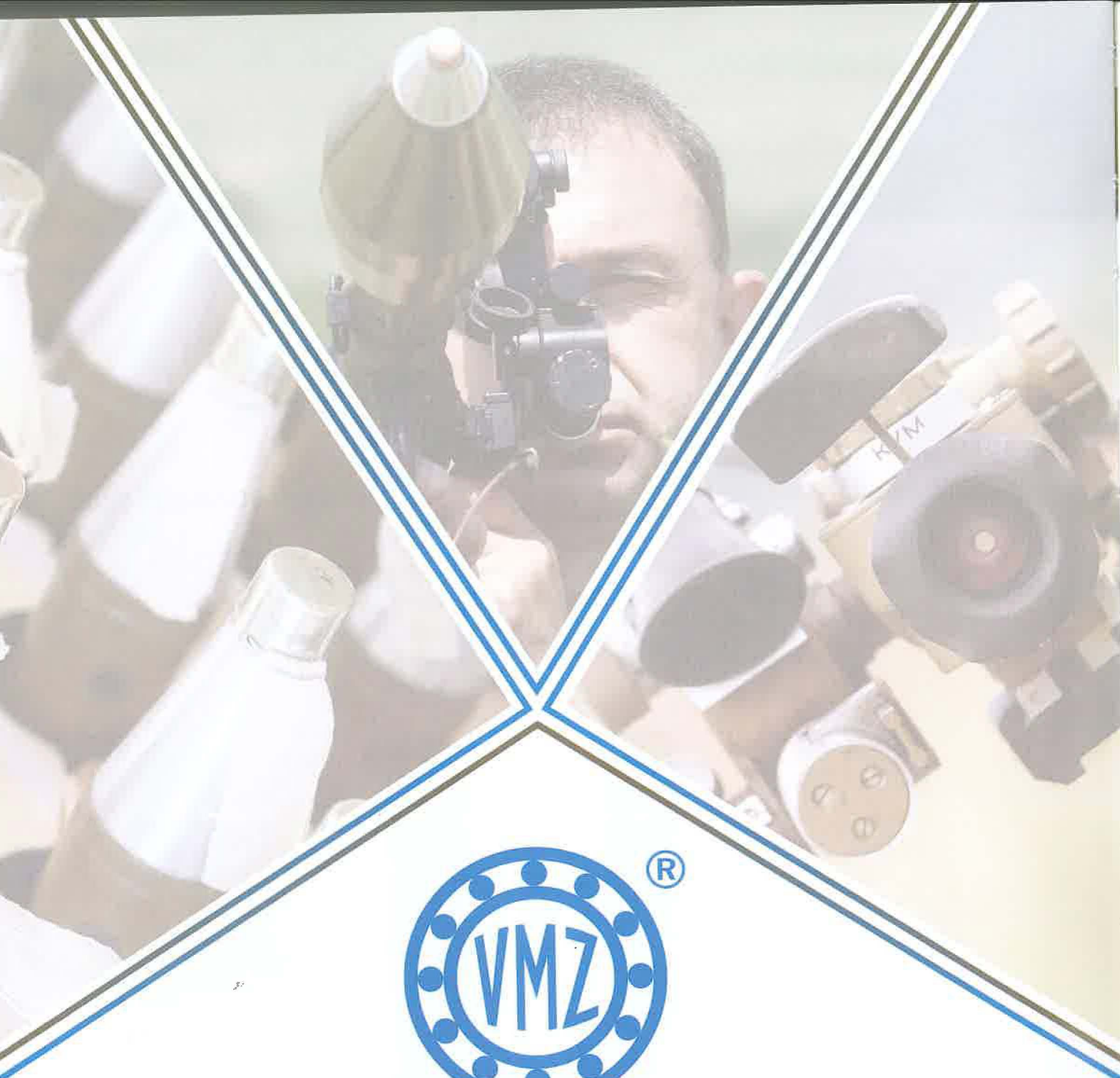
The ZV-70 pyrodelay element is designed for transmitting a pulse for initiating the grenade's rocket motor at a safe distance from the RPG-7V portable grenade launcher's muzzle end face.



### **CHARACTERISTICS**

Weight of pyrodelay element, g	35
Diameter of pellet, mm	Ø23,50
Diameter of body, mm	Ø10
Height, mm	60,40
Fixing thread	M12x1
Delay element burn time, s	0,090-0,125
Safe operational temperature range, °C	-40...50





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