



Zakłady **Mechaniczne** Tarnów



MODERNITY  
**FOR DEFENSE**







**Zakłady Mechaniczne Tarnów S.A.** continuously executes industrial activities since 1917 which makes the company one of the oldest enterprises in Tarnów.

Zakłady Mechaniczne Tarnów's showcase is a wide range of armament and military equipment: air defense systems, small arms and mortars. The training systems also play a particular role in our offer. Moreover, the company provides cooperation services including plastic working, electroplating and heat treatment, chemical technologies and machining.

The company is able to offer such a wide range of products through constant focus on the research, development and products innovation.

Research and Development Centre has the capability to create innovative defense solutions for the military and uniformed services. It assures strong market position for the company among the Polish defense industry leaders – at the same time the R&D contributes to development of the sales in foreign markets.

All companies and institutions interested in the development of technologies for the defense needs are welcome to cooperate with us. We also invite civil market business partners for cooperation.





## SNIPER RIFLES: **BOR 7.62, .308 ZMT HS**



### **BOR 7.62 BOLT-ACTION SNIPER RIFLE**

The BOR-7.62 bolt-action sniper rifle is fed by 7.62 x 51 mm NATO (.308 Winchester). The rifle is equipped with a Picatinny rail for embedding the optical sight, night vision or other devices. The weapon is equipped with an effective muzzle break, a folding bipod and a rear support. The rifle is designated for precise shooting up to 1200 m against live force or lightly armored military equipment.



### **.308 ZMT HS HUNTING AND SPORTING RIFLE**

The .308 ZMT HS Bolt-action Sniper Rifle is fed by a .308 Winchester ammunition and it's a special construction for civilian market. This rifle model is designed for hunters and sport shooters specializing in precision shooting for long distances. The rifle meets all the requirements related to the weapon usage on Polish and European civilian markets. The .308 ZMT HS is equipped with a Picatinny rail which is designed for various bipod mounts and other devices. Manufacturer introduced several buttstock solutions – optionally it can be equipped with a muzzle device.

TECHNICAL DATA	BOR 7,62	.308 ZMT HS
Ammunition	7.62 x 51 mm NATO (.308 Winchester)	7.62 x 51 mm NATO (.308 Winchester)
Range	1200 m	1200 m
Length	980 mm	980 mm
Barrel length	660 mm	660 mm
Weight	5.7 kg	5.7 kg
Magazine capacity	10 rounds	5 rounds



## SNIPER RIFLES: SKW .308, SKW .338



SKW .308



SKW .338

### SEMI-AUTOMATIC SNIPER RIFLES **SKW .308 / SKW .338**

The Semi-automatic Sniper Rifles (SKW) are available in the following calibers 7.62 x 51 mm (.308 Winchester) and 8.6 x 70 mm (.338 Lapua Magnum). The weapon was designed in a classic structural system and is fully adequate and compatible with presently occurring trends. The Semi-automatic Sniper Rifle operates on the basis of energy use of combusted gunpowder gases which are lead off through the side barrel gas port. The energy is transferred to the slide (bolt carrier) by a simple short motion of a gas piston. The bolt is locked by turning. The weapon features a modular construction, great ergonomic usage, an easily replaceable barrel and a folding buttstock. The rifles are dedicated for military and law enforcement however, they can be offered for civilian market as well.

TECHNICAL DATA	SKW .308	SKW .338
Ammunition	7.62 x 51 mm .308 Winchester	8.6 x 70 mm .338 Lapua Magnum
Effective range	900 m	1500 m
Barrel length	16" (406 mm) 20" (508 mm)	26" (660 mm)
Total length (buttstock unfolded/folded)	995 / 738 (with 16" barrel) 1100 / 843 (with 20" barrel)	1300 / 1045 mm (with 26" barrel)
Weight	5.6 kg with 16" barrel 5.8 kg with 20" barrel	7.7 kg with 26" barrel
Magazine capacity	10 / 20 rounds	10 rounds





### **ALEX-338** SNIPER RIFLE

The Alex-338 Bolt-action Sniper Rifle is fed by an 8.6 x 70 mm (.338 Lapua Magnum). High energy caliber – the 8.6 mm is characterized by a long distance range, a great power of destruction while maintaining a proper accuracy and keeping overall light weight. The rifle is designated for precision shooting to point targets such as live force located within long distances – up to 2000 m and lightly armored targets – up to 1000 m.

#### TECHNICAL DATA

Ammunition	8.6 x 70 mm (338 Lapua Magnum)
Range	2000 m
Length	985 mm
Barrel length	660 mm
Weight	6.1 kg
Magazine capacity	5 rounds





### ZMT WKW-50 LARGE-CALIBER SNIPER RIFLE

The 12.7 ZMT WKW 50 Large-caliber Sniper Rifle appeared as a result of development research of the previous weapon WKW TOR 12.7. The verified construction allowed lowering the weight, the overall functionality and ergonomics significantly improved as well as safety of usage. The WKW ZMT 50 is designated for precision shooting to point targets within a 1700 m distance and for annihilation of technical equipment within a 2000 m distance (lightly armored off-road vehicles, targets covered with light field shields, planes and aircrafts at the airport, radar and transponders equipment, technical devices and opto-electronic equipment). Operating temperature range during usage varies from -40° to +55°.



TECHNICAL DATA	WKW TOR 12.7	ZMT WKW-50
Ammunition	12.7 x 99 mm NATO (.50 BMG)	12.7 x 99 mm NATO (.50 BMG)
Range	2200 m	1 700 – 2000 m
Length	1350 mm	1302 mm
Barrel length	880 mm	820 mm
Weight	17.1 kg	14.0 kg
Magazine capacity	7 rounds	7 rounds



## MACHINE GUNS: **UKM 2000P, UKM 2000C**



### **UKM 2000P** GENERAL PURPOSE MACHINE GUN

The modified 7.62 mm UKM 2000PE General Purpose Machine Gun is fed with 7.62 x 51 mm ammunition fixed with a standard M13 disintegrating linked belt. The UKM 2000PE is intended for fighting manpower, firing assets and technical equipment regardless of terrain diversification, in any weather conditions at night and during daylight. The newest version of the rifle had been elaborated in order to enhance reliability, durability and ergonomics.

### **UKM 2000C** GENERAL-PURPOSE MACHINE GUN

The modified 7.62 mm UKM 2000C General-Purpose Machine Gun right hand feeding mechanism, it is adjusted to firing from the platform of the carrier. It was designed for fighting manpower, firing assets, technical equipment regardless of terrain diversification in any weather conditions at night and during daylight. The applied ammunition is of the following caliber: 7.62 x 51 mm NATO and M13 ammunition belt. The newest version of the machine gun had been accomplished in order to enhance infallibility, permanence and ergonomics.



#### TECHNICAL DATA

#### UKM 2000P

#### UKM 2000C

Ammunition	7.62 x 51 mm NATO	7.62 x 51 mm NATO
Range	1500 m	1500 m
Length	944 mm with folded buttstock	1058 mm
Barrel length (without silencer)	540 mm	521 mm
Weight	10 kg	11 kg
Magazine capacity	100/200 rounds	250 rounds
Rpm (rounds per minute)	700-900 rpm	700-900 rpm



## MACHINE GUNS: WLKM 12.7, WKM-BM/NSW-UTIOS

### WLKM 12.7 MULTI-BARREL MACHINE GUN

The WLKM-12.7 Multi-Barrel Machine Gun is an externally driven electric-powered Gatling-style gun fed with 12.7 mm x 99 NATO (.50 BMG) ammunition fixed in a M9 disintegrating ammunition belt. The application of four rotating barrels helped to achieve a huge rate of fire up to 3600 rpm. The weapon can be used as an armament for a helicopter turret – e.g. W-3PL Głuszek or as aerial gun pod equipment. The usage varies; other than that the weapon can be used for ground vehicles, floating units, boats, permanent or mobile firing posts. The WLKM 12.7 is designated against manpower, surface targets, and aerial objects of different resistance parameters.



### WKM-BM/NSW-UTIOS HEAVY MACHINE GUN

The WKM-Bm/NSW-UTIOS Heavy Machine Gun is an automatic weapon intended to combat enemy manpower hidden behind light shields, lightly armored terrestrial targets, low flying airborne targets as well as naval vessels. The weapon can be integrated with the Remote Controlled Weapon Station (the ZSMU) or it can be installed on the following various mounts: pedestal socket, pintle carriage, tank mount, rotary vehicle hatch, general-purpose tripod or terrestrial tripod. The weapon can be used in all weather conditions, different climate zones at any time of the day or at night.

TECHNICAL DATA	WLKM 12.7	WKM-Bm/NSW-UTIOS
Ammunition	12.7 x 99 mm NATO	WKM-Bm: 12.7 x 99 mm NATO NSW-UTIOS: 12.7 x 108 mm
Range	2000 m	2000 m
Length	1300 mm	1560 mm
Barrel length	900 mm	1100 mm
Weight	50 kg	25 kg
Rpm (rounds per minute)	3 600 rpm	700-800 rpm



## RGP-40 MULTI-SHOT GRENADE LAUNCHER (40 MM)



## **RGP-40 MULTI-SHOT GRENADE LAUNCHER (40 MM)**

The weapon is designed for disabling and fighting manpower, annihilation of technical equipment, buildings, firing assets, lightly armored vehicles, raising smokescreens or conducting non-lethal actions. The RGP-40 is a semi-automatic six round cylinder construction weapon – it fires grenades of 40 mm x 46 NATO caliber. The weapon has an integrated cylinder containing six chambers, each chamber is 140 mm long – this feature allows using various kinds of ammunition even of a particular type of usage. There are three Picatinny rails mounted on the barrel shield especially for additional accessories. Cover fire capabilities of the weapon allow covering a vast area of approximately 20 x 60 m within a distance of 400 m (low velocity ammunition) and 800 m (medium velocity ammunition). The RGP-40 can be easily placed in the same category and class among other existing world solutions bearing in mind its' weight, rate of fire and reliability.

### TECHNICAL DATA

Ammunition	40 x 46 mm NATO, 40 x 51 mm NATO
Range	400 – 800 m
Length	850 mm
Weight	6.5 kg
Magazine capacity	6 chambers (cylinder)
Work cycle (action)	Semi-automatic



### LM-60D LIGHT INFANTRY MORTAR 60 MM

It's a long range mortar designed for annihilation of manpower, an enemy firing assets displaced on counter slopes, in ravines and behind obstacles in build-up area. The mortar can also destroy observation and command posts as well as light field fortifications at any time of the day or night, in any weather conditions. This is the typical armament for Infantry Subunits, especially for the Mountain Infantry, Air-mobile Forces, Landing Troops, Airborne Forces and Special Forces.



### LMP-2017 LIGHT INFANTRY MORTAR

The LMP-2017 Light Infantry Mortar is intended for annihilation of manpower, light field fortifications, firing assets, military technical equipment. The recommended work cycle for this weapon is a medium indirect fire under the condition that the target is visible from the firing post in conditions of good optic visibility, in all weather conditions at any time of the day. The LMP-2017 can be equipped with the liquid distance indicator or the digital sight. The weapon is flexible for any type of ammunition; however, it must comply with the 4425.2 STANAG NATO norms. After the barrel replacement the same requirement must be obeyed. The aforementioned ammunition is used by Armed Forces of the Republic of Poland and it is especially dedicated for LM-60D and LM-60K mortars.



TECHNICAL DATA	LM-60D	LMP-2017
Ammunition	59.4 mm	60.4 mm NATO; 59.4 mm
Range	70 – 2330 m	120 – 1300 m
Rpm (rounds per minute)	25 rpm	25 rpm
Weight	19.3 kg	≤7.5 kg
Service	3	2/1
Work cycle (action)	Single-shot	Single-shot



## ONBOARD ARMAMENT: ZSW-12.7, LZS-12.7



### ZSW 12.7 REMOTE CONTROLLED GUN TURRET

The ZSW-12.7 is intended for helicopters and aircrafts as a steady onboard armament – it is integrated with onboard remote controlled weapon system connected to the turret mounted under fuselage. The weapon system is controlled by helmet mounted steering device (e.g. "Orion" system). It is for self-defense of an aircraft and at the same time for annihilation of combat equipment

(e.g. technical devices, lightly armored military vehicles, targets covered with light field shields, helicopters and aircrafts at the airport, radar and transponder stations, opto-electronic devices etc.). The turret can reach targets on the ground, in the water and in the air within a 2000 m distance.



### LZS-12.7 AIRBORNE GUN POD FOR HELICOPTERS AND PLANES

The integrated LZS-12.7 Gun Pod is a detachable pod mounted externally – it is suspended on typical bearing pylons (BD3-55M) of aircrafts and helicopters which comply with NATO standard mounting and Military Armament mounting norms. The pod can be armed with the .50 BMG (12.7 x 99 mm) WKM-Bm or the WLKM-12.7 Multi Barrel Machine Gun containing NATO standard ammunition 12.7 x 99. The pod is suspended on the external junctions – it is a weapon of multiple usage (after replenishing of ammunition). LZS-12.7 and LZS-12.7 WLKM are intended for arming helicopters and other aircrafts used for combating terrestrial targets as well as airborne targets of differential resistance parameters.

TECHNICAL DATA	ZSW-12.7	LZS-12.7
Uzbrojenie	WKM-Bm	WKM-Bm / NSW
Ammunition	12.7 x 99 mm NATO	12.7 x 99 mm NATO / 12.7 x 108 mm
Wymiary	1640 x 775 x 470 mm	2515 x 555 x 545 mm
Weight	135 kg	180 kg
Ammunition capacity	350 rounds	250 rounds
Feeding and reloading	pneumatic	pneumatic



**ZSMU A3 REMOTE CONTROLLED WEAPON STATION**

The ZSMU-1276 A3 remote controlled weapon modules are intended to equip a vast range of vehicles, watercrafts and stationary objects. The weapon provides sufficient fire to annihilate lightly armored terrestrial targets and low-flying airborne targets at any time of the day. The wide range of angles that position the module gives an effective fire support. It is designated for annihilation of live force, technical equipment, lightly armored vehicles, stationary objects and targets in motion that move at different velocities and low flying airborne targets at any time of day. The ZSMU A3 is equipped with an external feeding mechanism, a turret stabilizer and a video-tracker. The equipment is designated for usage in all weather conditions.

The ZSMU-1276 A3 remote controlled weapon station is designated for various carriers for example:

- wheeled armored vehicles,
- off-road passenger vehicles,
- specialized wheeled and tracked vehicles,
- stationary objects and floating units.

**TECHNICAL DATA**

Operating service	1 person
Total weight	165 kg $\pm 5\%$
Reloading	basic: electrical emergency: manual
Work cycle	basic: through the control desktop emergency: manual operating
Elevation angle scope	(in elevation) $-15^{\circ} - +50^{\circ}$
Azimuth angle scope	n x $360^{\circ}$



## ONBOARD ARMAMENT: ZSMU A5

### ZSMU A5 REMOTE CONTROLLED WEAPON STATION

Remote Controlled Weapon Station is designated for crews driving armored vehicles and soldiers serving missions in stationary objects. The weapon provides rotary observation possibilities and it effectively defends against direct attack of an enemy. The weapon minimizes the threat of attack against the operator in any terrain conditions, regardless of time of the day or weather conditions.

The ZSMU A5 is designated for carrying out combat tasks with application of the following weapons: the 12.7 mm WKM-Bm machine gun and the 7.62 mm UKM-2000C machine gun – this is the main configuration for the module. The stabilization of the armament and built-in cameras give the operator effective possibilities of firing when the vehicle is in motion at the speed up to 60 km/h on the off-road terrain. The station is equipped with an automatic target tracking – it tracks down even flying objects. The entire system of fire control is enhanced by precise ballistics that gives a possibility of firing towards targets in motion – for example: terrestrial and aerial targets of micro class. The station is equipped with a day/night camera, thermal camera and laser range-finder – the aforementioned components are integrated with an auto-cleaning system in the one entire module. The ZSMU A5 can be additionally equipped with a secondary/optional operator stand. It can be easily integrated with other vehicle systems for example with a meteo-station or radiation detection system. In case of emergency like power outage – the ZSMU A5 weapon station is adjusted to manual operation of firing.

The ZSMU A5 Remote Controlled Weapon Station can be assembled and integrated with various types of carriers, for example:

- wheeled and tracked armored transporters,
- off-road passenger vehicles,
- specialized tracked or wheeled vehicles,
- stationary objects and floating units.



### TECHNICAL DATA

Operating service	1 person
Total weight	303 kg
Reloading	basic: electrical emergency: manual
Work cycle	basic: through the control desktop emergency: manual operating
Elevation angle scope	(in elevation) $-15^{\circ} - +70^{\circ}$
Azimuth angle scope	n x $360^{\circ}$



### ZSU-23-4 "AFRICA" SELF-PROPELLED ANTI-AIRCRAFT ARTILLERY ROCKET SYSTEM

The ZSU-23-4 "Africa" is a modernized version of the 23 mm ZSU-23-4 four-barrel self-propelled anti-aircraft cannon named "Shilka" – the improved version is more efficient and its' combat, tracking and tactical features are enhanced as well. The range and effectiveness of combating airborne targets were amplified while the response time of the system had been significantly reduced. The combat work cycle had been completely changed to a passive system, as the result of simplification of service activities the operation procedures require less work now, therefore the crew was reduced from four to three soldiers. The artillery rocket set was integrated with air-defense command and control system. The target detection range is equal to approximately 24 km, while the target tracking is displayed on the desktop in 6x3 pixel resolution. With application of 23 mm cannons and "GROM" missiles, the ZSU-23-4 "Africa" is devoted for annihilation of low flying airborne targets such as: aircrafts, helicopters, surface-to-air missiles, unmanned aerial vehicles, airborne forces, unarmored and lightly armored terrestrial targets.

The modernization to the current standard of ZSU-23-4 includes the following features:

- application of undetectable opto-electronic digital fire control system allows automatic tracking of a target at any time of day,
- elimination of a radar and active observation and optical means for a commander and a driver,
- significant reduction of thermal emission that would expose the entire set on the battlefield,
- increase in optical visibility range especially in conditions of limited visibility – as the result of adaptation of passive thermal tracks,
- providing the newest high-tech digital communication system which is responsible for tactical data exchange with the master air-defense command system,
- enhancement of traction properties and a significant increase in operating range,
- the artillery rocket set was equipped in air-conditioning of the turret, this gives a better working comfort in African climate conditions,
- the set is also equipped with turret ventilation and power generator interval ventilation – this feature enhances infallibility in increased dustiness conditions.







## THE MODERNIZATION PACKAGE FOR **ZU-23-2CP** CANNON

The modernization package is an upgrade to the current version of the cannon – this upgrade includes automation of mechanisms that control movement of the cannon in azimuth and elevation – and these features significantly improve aiming and firing. The modernization package consists of drive controller, electric engines, transmissions, drive control manipulator, loading and feeding mechanism. Package installation significantly improves and accelerates overall work of the cannon. At the same time the initial features of the weapon are maintained – manual operation – which is important in case of emergency such as power shortage or electric system breakdown – then the only way of firing is the manual mode. Electric drives provide fluent movement, smooth dynamics and real benefits, which cannot be achieved in the manual mode.



## **ZU-23-2CP** ANTI-AIRCRAFT ARTILLERY SYSTEM

The ZU-23-2CP is equipped with the two 23 mm 2A14 cannons and a ring-shaped recursive target sight. The 23 mm double anti-aircraft with the ring-shaped recursive sight constitute a powerful mean of combat against airborne targets within a 2500 m distance and within 1500 m altitude. The primary purpose of the cannon is defense against airborne troops and aircrafts. The constructional properties of the cannon allow for annihilation of lightly armored terrestrial targets, firing posts within a 2000 m distance. The ZU-23-2CP is intended for a combat against enemy with the following types of 23 mm ammunition: Armor-piercing Incendiary with Tracer (API/BZT), High-explosive Incendiary with Tracer (HEI/OFZT), Armor-piercing Discarding Sabot with Tracer (APDS-T) and Frangible Armor-piercing Discarding Sabot with Tracer (FAPDS-T). The weapon is designated for users from countries with dry and tropical climate.





### **ZU-23-2MR** NAVAL ANTI-AIRCRAFT ARTILLERY SYSTEM

The ZU-23-2MR "Wróbel" II Naval Anti-Aircraft cannon is intended for the vessels and watercrafts (ships and boats). The cannon annihilates airborne targets such as: aircrafts, helicopters, surface-to-air missiles, unmanned aerial vehicles, airborne troops, unarmored targets, lightly armored terrestrial targets and watercrafts. The ZU-23-2MR is equipped with the following mechanisms: electro-hydraulic drives which control the cannon in azimuth and elevation and an embedded hydraulic reloading system. The weapon is armed with the two 23 mm cannons – the internal liquid coolant prevents the system from overheating. The two cannons are fed from the two loading ammunition magazines – each containing 200 rounds ammunition belt. The cannon can be fired by one person and it is adjusted to sub-caliber ammunition.

### TECHNICAL DATA

Firing assets	2 cannons (2A14) – caliber: 23 mm
Artillery firing angles	Horizontal: 360° (traverse) Vertical: from -10° to +90°
Rounds per minute (rpm)	400 rpm (for one automatic gun)
Practical range: maximum vertical/angular/horizontal	1500/2500/2000 m (for API and HEI)
Effective range for terrestrial targets	2000/3000/2500 m (for APDS and FAPDS)



### SPARE PARTS

Zakłady Mechaniczne Tarnów S.A. manufactures the following spare parts for 23 mm air-defense systems:

- barrel assembly,
- slide pistons,
- breechblock mechanism,
- retracting mechanism,
- recoil buffer plate,
- trigger mechanism,
- feed lever cover,
- feed lever cover axle,
- recoil buffer,
- breechblock receiver,
- cartridge limiter,
- feed locking mechanism,
- feed lever with pawls assembly,
- barrel wedge with grip,
- right and left carrier,
- barrel wedge,
- cocking lever,
- rear cover.



## CONTAINER SYSTEMS: **LOOK**

### **LOOK** – LIGHT OBSERVATION-PROTECTIVE CONTAINER

The Light Observation-Protective Container is intended for securing and protecting of soldiers who perform surveillance and defense duties. It is designed for logistics and operational bases or other relevant strategic facilities such as controlling checkpoints, airfields, airports during peace time as well as at war support operations. The LOOK is resistant against small arms fire. It is equipped with bulletproof windows, a remote-controlled weapon station and multi-sensor surveillance platform. It can be a part of military base protection system or it can operate autonomously as a single unit. The LOOK container increases protection level of military staff serving combat missions at military units, checkpoints and strategic warfare installations (due to its' armor and practicality of surveillance devices soldiers can detect targets through visible and infrared light). As the result – the soldier loss is decreased, and its' combat capabilities are effective in controlled areas by an integrated armament. Each container is equipped with the following devices: monitor and observation post, control stand for the commander of the guard, firing post with control screen panel and manual manipulator, communication system, armored, bulletproof windows, manually operated hatch in the roof, heating system, air-conditioning and emergency power generator. Each container is resistant to level 2 firing – according to STANAG norm. The container is very easy to transport, additionally it is equipped with a hook system for loading it on a platform of a vehicle – this feature ensures quick mobility and within a few minutes the object is on the move.





### MOBILE CONTAINER SHOOTING RANGE **40FT HC**



This is an Object for Basic and Advanced Training – the Mobile Container Shooting Range 40FT HC is designated for secure training and shooting practice with application of live ammunition using standard-issue weapons and combat firearms. The complete shooting range consists of two or more connected containers where the training can be conducted within a 5 to 50 m distance – the shooting practice can be carried out in a steady position or in motion from various standpoints and firing lines. The installed interactive training simulator – multimedia trainer allows application of any software and editing of own tactical scenarios and combat episodes that are created according to the user. This is the only object in the country where you can practice shooting to targets with night vision goggles. The shooting range can be placed and set near any facility or any adjacent area – it can be started within a few minutes.







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