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INDIVIDUAL WATER TREATMENT FILTER

DESCRIPTION:
The individual filter is designed for an individual soldier to secure their needs for potable water under special circumstances. The filter purifies surface water from natural pollutants, as well as deliberate contaminants. The filter removes toxic substances (mechanical, biological and chemical agents) from water thus reducing the possibility of contamination and infection. It facilitates survival and operation under conditions where there is no potable water available. The filter is certified STANAG 2136 MED-compliant.

BASIC TECHNICAL CHARACTERISTICS:

- time needed to win the first batch of treated water 2 minutes;
- total amount of water treated 20 dm^3;
- maximum capacity per day 10 dm^3;
- filtration medium activated carbon;
- water treatment pills.

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INDIVIDUAL CAMOUFLAGE SCREEN

DESCRIPTION:

Individual Camouflage Screen is to be used to camouflage a single soldier, and after a few (4 max.) are combined they can conceal a group. The Screen provides high level of camouflage capability in visible- and thermal (near and far infrared) spectral range. It is composed of two layers; a woven fabric one and a knitted fabric one. The former protects the soldier against unfavourable weather conditions (wind, rain, snow) and can serve as improvised bivouac shelter, emergency stretcher or a tent, while the latter is characterised by a spatial structure and is responsible for camouflage in optical spectral range during daylight. IEM is unique in that it has an innovative pixel camouflage dedicated to the Central European conditions. The novelty also lies in the mixture of a micro-and macro patterns using five colours, while the two key elements are the Knitted Fabric Screen and the Woven Fabric Screen.

BASIC TECHNICAL CHARACTERISTICS:

- Individual Camouflage screen (set) max. 2750 g;
  transport bag dimensions: 140 × 170 × 320 mm;
- Knitted Fabric Camouflage Screen (set) max. 1000 g;
  transport bag dimensions: 110 × 110 × 280mm;
- Woven Fabric Camouflage Screen 1950 g;
  dimensions after spread: 2275 × 1900 mm;
- Knitted Fabric Camouflage Screen 1200 g;
  dimensions after spread: 2315 × 1940 mm.

The development of the project involved:

LUBAWA SA

6th AIRBORNE BRIGADE KRAKÓW

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MULTISPECTRAL WINTER CAMOUFLAGE NET

DESCRIPTION:

Multispectral winter camouflage net is to be used to directly camouflage military armaments and combat equipment or other objects in wintertime against reconnaissance tools and instruments in visible, thermal and radar ranges.

The net provides proper camouflage efficiency in the following winter conditions:

- fresh, full snow cover – one side of the net;
- with local lack of snow (ground beneath showing) and the snow cover being soiled – the other side of the net.

This net is a flat mix of a backing layer and a garnish layer connected permanently in every configuration listed below.

BASIC TECHNICAL CHARACTERISTICS:

- camouflage range for the equipment camouflaged against reconnaissance instruments in winter:
  - optical range: wavelenght $\lambda = 0{,}35 \cdot 10^{-6} \div 1{,}2 \cdot 10^{-6}$ m;
  - thermal range: wavelenght $\lambda = 3 \cdot 10^{-6} \div 14 \cdot 10^{-6}$ m;
  - radar range: wavelenght $\lambda = 3 \cdot 10^{-3} \div 1 \cdot 10^{-1}$ m.
- average attenuation of the camouflaged object ≥ 12 dB;
- temperature difference between the background terrain and the surface of the camouflaged object, assuming that the fluctuations of the background radiant temperature do not exceed 6°C - ≤ 2°C.
- Net dimensions: type-dependent (A, B, C, D):
  - Set A: 2,7 x 6 m;
  - Set B: 6,7 x 12 m;
  - Set C: 12 x 12 m;
  - Set D: 12 x 15 m.

The development of the project involved:

miranda

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MULTISPECTRAL CAMOUFLAGE NET

DESCRIPTION:

Multispectral camouflage net is to be used to directly camouflage military armaments and combat equipment or other objects in wintertime against reconnaissance tools and instruments in visible, thermal and radar ranges.

The net is composed of two key elements: a backing layer and a garnish layer. Both those elements exhibit camouflage properties

BASIC TECHNICAL CHARACTERISTICS:

- Camouflage range for the equipment camouflaged against reconnaissance instruments:
  - Optical range - wavelenght $\lambda = 0{,}35 \cdot 10^{-6} \div 1{,}2 \cdot 10^{-6}$ m;
  - Thermal range - wavelenght $\lambda = 3 \cdot 10^{-6} \div 14 \cdot 10^{-6}$ m;
  - Radar range - wavelenght $\lambda = 3 \cdot 10^{-3} \div 1 \cdot 10^{-1}$ m.
- Average attenuation of the camouflaged object ≥ 12 dB;
- Temperature difference between the background terrain and the surface of the camouflaged object, assuming that the fluctuations of the background radiant temperature do not exceed 6°C - ≤ 2°C;
- Net dimensions: type-dependent (A, B, C,D):
  - Set A: 2,7 x 6 m
  - Set B: 6,7 x 12 m
  - Set C: 12 x 12 m
  - Set D: 12 x 15 m

The development of the project involved:
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MILITARY ENGINEER TOOLSET

DESCRIPTION:

Military Engineer Toolset (MET) is a modular set designed to aid and assist in task performance by a team of sappers (or their equivalent) in the field of mine-laying, main barrier construction and engineer reconnaissance. MET was designed using a completely new approach to creating this type of a set, as it includes modern backpacks with detachable hip belts, increasing their functionality. Functional modules were devised, thanks to which soldiers have easier access to all the tools they need at a given moment. The modular structure of the components facilitates the selection of proper tools depending on the mission/task to be performed. The toolset also includes Individual Camouflage Screens capable of concealing the presence of the soldier, protecting them from detection in different spectral ranges. Yet another novel element includes the aerial reconnaissance and observation drone, increasing the situational awareness of soldiers. Military Engineer Toolset was designed with the new tasks that the soldiers are to perform on contemporary battlefields in mind.

KEY ELEMENTS OF THE TOOLKIT:

- Initiating module: 1pc.;
- Detonating line construction module: 2 pcs.;
- Gap marker module: 2 pcs.;
- Tape-measure module, 100 m: 3 pcs.;
- Metal detector module: 6 pcs.;
- Power supply module: 1 pc.;
- Anchor module: 4pcs.

The development of the project involved:

LUBAWA SA

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MN-123 SCATTERABLE ANTI-TANK SURFACE MINE

DESCRIPTION:
MN-123 full-width anti-tank mines are designed to lay minefields using pre-packaged mine canisters. The MN-123 minefields can be laid in varying terrain. If required, these mines can also be laid manually. MN-123 houses a Misznay Schardin shaped charge so that the mine can function effectively either way up. The mine has an electronic magnetic influence fuze which incorporates self-destruct and self-neutralisation features.

BASIC TECHNICAL CHARACTERISTICS:
The mines are dispensed from tubes mounted on an armoured vehicle in 4 racks of 20:

- Mine weight: 3,7 kg;
- Fue power source: 6,8 V;
- Self-destruct: 2, 3, 5 days;
- Penetration: 60 mm/0,3 m;
- Resistant to:
  - strong EM field generated by the military radio systems;
  - explosive and electronic countermeasures;
  - explosion of an adjacent mine.
- Anti-disturbance feature.

The development of the project involved:

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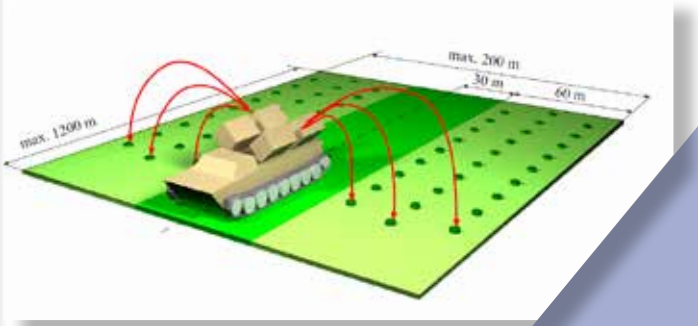
ISM MINE LAUNCHING SYSTEM



DESCRIPTION:

The ISM mine launching system codenamed “Kroton” was designed for laying scatterable anti-tank minefields. The ISM is placed on the MTLB-U armoured tracked carrier. The mine used in this system is a full-width mine with a magnetic influence fuse. Having detected the target, the mine fuse initiates the detonation. It has two safety levels which make it impossible to actuate the mine during storage, transportation and laying. ISM mines incorporate anti-disturbance and self-destruct features while the shaped charge is capable of penetrating up to 60 mm-thick target armour.

The system consists of:

- Carrier vehicle: set;
- Launcher racks: 4 sets;
- Fire-control unit: 1 set;
- Canisters with MN-123 AT mines: 80 pcs.

BASIC TECHNICAL CHARACTERISTICS:

- Mine payload: 400 mines in 80 canisters;
- Mine throwing distance: up to 100 m from the vehicle's driving axis;
- Minefield dimensions 1000 × 60 m;
- Minimum mining range: 30 m;
- Mine density: 0,4 mines per meter;
- Minelaying time: up to 15 minutes;
- Capability to launch from one side only, on both sides and to the rear;
- Mine self-destruct: 2, 3 or 5 days.

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PMN SCATTERABLE MINE-LAYING VEHICLE

DESCRIPTION:
The Scatterable Mine-laying Vehicle (Polish acronym: PMN) codenamed “Baobab-K” is the successor to the ISM Mine Launching System, which was placed on the MTLB armoured tracked carrier. This mine-laying vehicle was designed for laying scatterable anti-tank minefields of varying size and density, capable of destroying or incapacitating vehicles, including armoured vehicles. PMN utilizes 6 launchers (600 mines) based on a Jelcz 8×8 truck chassis. The armoured cabin accommodates a two-member crew and offers STANAG 4569 ballistic protection up to level one.

W skład kompletu wchodzi:

- Carrier vehicle: 1 set;
- Launching platform: 1 set.;
- Launche racks: 6 sets;
- Canisters with MN-123 AT mines: 120 pcs.;
- Steering and control unit: 1 set;
- Crane: 1 set.

BASIC TECHNICAL CHARACTERISTICS:

- Mine laying speed: 5 - 20km/h, (dependent on minefield density);
- Mine self-destruct: 2,3 or 5 days;
- Mine payload: 600 mines in 120 canisters;
- Minefield depth: 60 ÷ 180 m;
- Minefield lenght: up to 1800 m;
- Mine density: 0,15 ÷ 1,2 mine per meter.;
- Reloading time: < 30 minutes;
- Capability to launch from one side only, on both sides and to the rear.

The development of the project involved:

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SKMP SYSTEM OF CONTROLLED ANTI-TANK MINES

DESCRIPTION:

SKMP System of Controlled Anti-Tank Mines is capable of laying a modern section of a minefield consisting of Controlled Anti-Tank Mines (KMP – Pol.) and controlling its readiness. The effector is an explosively-formed projectile (EFP) within the mine. The KMP mines detect and identify the target automatically by use of seismic and acoustic sensors, as well as laser scanner. When the target is identified and the decision is made automatically to destroy it, the EFP is aimed at an approaching vehicle using acoustic antennas. The detonation is initiated by the signal from the thermal sensor. SKMP is employed against enemy armoured vehicles and trucks within its effective range

BASIC TECHNICAL CHARACTERISTICS:

- RHA penetration: no less than 100 mm;
- Effective range: no less than 80 m;
- Communication with the KMP: coded, by radio;
- Number of KMP mines in a SKMP set:: 21 pcs.;
- Mine interval programming: 70 ÷ 100 m.

The development of the project involved:

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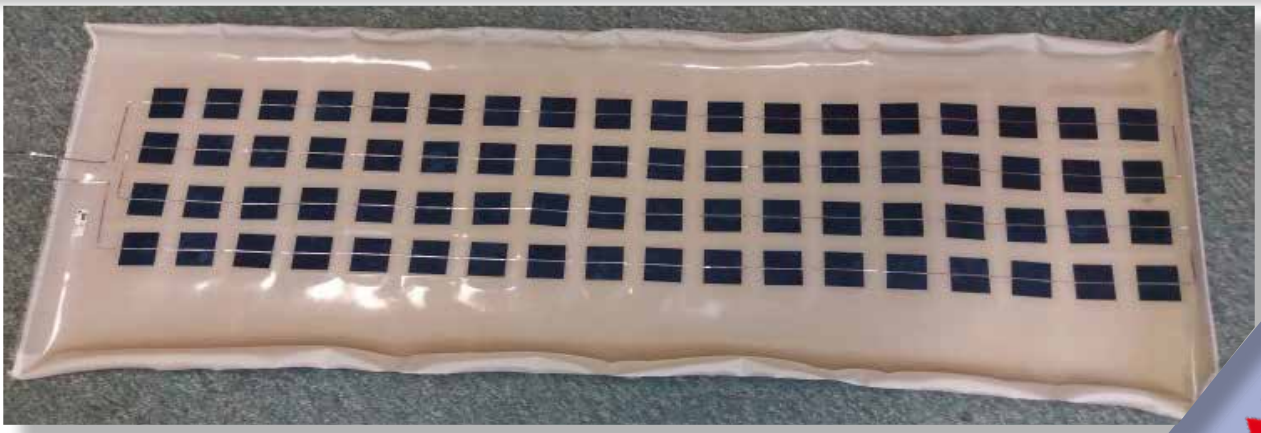
INNOVATIVE FLEXIBLE PHOTOVOLTAIC COATING (EPF)



DESCRIPTION:

The flexible photovoltaic coating (Polish acronym: EPF) is to be used as part of an emergency power source or for the development of a power generator in areas uncovered by the energy infrastructure. The coating assumes the form of photovoltaic cells placed onto a special, flexible substrate and protected with toughened glass When a few, several, or tens of cells are connected, solar modules (panels) are obtained.

BASIC TECHNICAL CHARACTERISTICS:

The basic version of EPF (one segment) in its production variant is presented in the photographs below. It is characterised by the following parameters:

- input voltage: 36 V;
- maximum power: 30 W;
- Dimensions (l. x w. x h.): 1,6 m x 0,5 m x 1,5 mm;
- EFP mass: ca. 1,9 kg;
- operational lifetime of many years;
- can be manufactured as long as it is necessary,
- allowing the segments to be joined to increase their total power.

The development of the project involved:

Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej

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NOVEL, MODULAR SOLAR CHARGER FOR MILITARY ENGINEER TOOLSET (IMLS-ZMR)

DESCRIPTION:

The handy and portable IMLS-ZMR power supply system is designed to charge the BATTERYstar400 powerbank, which is part of the Military Engineer Toolset (Polish acronym: ZMR). Notwithstanding this application, IMLS-ZMR can supply power to portable electricity receivers, e.g. tablets, smartphones, GPS devices, portable radios etc. The charger consists of a photovoltaic (PV) panel and an energy management block containing energy-storing supercapacitors, as well as a voltage control system adjusting the PV panel voltage to the powerbank charging voltage. The entire system is mounted in a case with IP68-compliant connectors. The product is the result of the TECHMAT STRATEG project.

BASIC TECHNICAL CHARACTERISTICS:

- Charging time: 18 h;
- Average cgarging voltage: 4,9 V;
- Average charging current: 0,99 A;
- Energy supplied: 83,6 Ah;
- BATTERY start 400 capacity 16,7 Ah;
- Discharge time:
  3,8 h (USB 5V); 1,9 h (Jack 12V);
- Energy delivered:
  44,67 Wh (USB 5V); 55.23 Wh (Jack 12V).

Project implemented under:

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NOVEL, MODULAR SOLAR CHARGER (NMSC0-1-W) – MILITARY VERSION

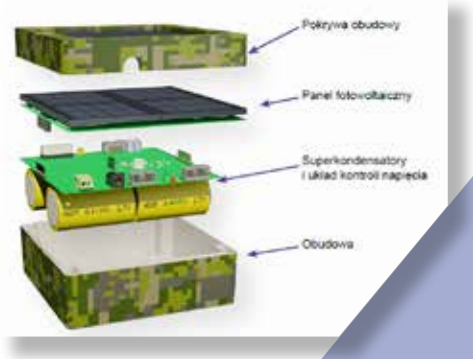
DESCRIPTION:

Efficient and lightweight power system is designed for special dual-use (military and civilian) applications. It can supply electricity to portable electricity receivers, e.g. tablets, smartphones, GPS devices, etc. A photovoltaic (PV) panel consists of silicon solar cells and a current source block (voltage control system and supercapacitors). The entire system is mounted in a housing with a camouflage applied to it.

The product is patented: P.239883.

BASIC TECHNICAL CHARACTERISTICS:

- Supercapacitor battery nominal voltage 5,0 V;
- Supercapacitor battery nominal capacity 400 F;
- Theoretical amount of energy stored 1,39 Wh;
- Time of first charge 255 minutes;
- Discharge time needed to obtain voltage equal Usc = 2V: 720 seconds;
- Energy supplied to supercapacitors during charging: 0,3 Wh;
- Charge time 135 minutes.



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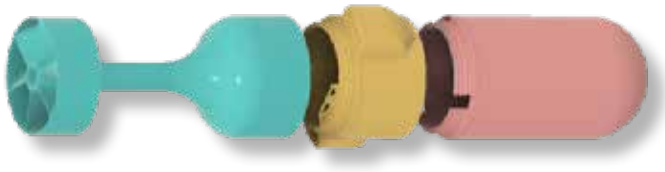
UNIVERSAL HIGH-EXPLOSIVE DUAL-PURPOSE GRENADE



ASSIGNMENT:
Universal High-Explosive Dual-Purpose Grenade (Polish Abbreviation UGPO) is designed for versatile deployment in various combat scenarios. It can be utilized as a hand grenade, an anti-personnel mine, or a directed anti-tank warhead, employing different types of fuzes, including the fuzes triggered by either pressure applied or tension on an attached tripwire. Additionally, the UGPO can be deployed as a drop munition for drones or serve as a loitering munition warhead.

DESCRIPTION:
UGPO has been developed as a multifunctional payload capable of targeting both personnel and lightly armoured vehicles, up to and including STANAG 3 protection levels. The design of the explosive charge allows it to be used as a hand grenade, an anti-personnel mine/landmine, an anti-tank mine, a drone-dropped charge, or as a payload for FPV drones. Key advantages include a simplified manufacturing process: its production feasibility without the need for advanced production lines or specialized explosives and elaboration and material compatibility - UGPO can be manually elaborated by soldiers using plastic explosives or explosives used in ore mining; TNT charges or thermobaric explosive materials. This versatility ensures that UGPO remains a reliable asset in various combat scenarios, providing effective support in modern military operations.

BASIC TECHNICAL CHARACTERISTICS:

- Class 400 armour plate penetration of up to 20 m; 20 mm at a distance
- No. of 4 mm fragments ca. 1150;
- Explosive mass (for plastic explosive) 250 g;
- Fragmentation range up to 10 m; 12 frag./1 m²

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CONTROLLED NARROW-EFFECT EXPLOSIVE CHARGE

DESCRIPTION:

Narrow-Effect Charge is designed for controlled engagement of enemy personnel, targeting armoured vehicles by damaging their observation and targeting instruments, lights, and windows, as well as providing protection for anti-tank minefields.
Narrow-Effect Charge is a component of the engineer barrier construction system, which falls under the domain of counter-mobility and enhances the survivability of military forces.
It is constructed with an aluminium-composite body filled with steel balls and an explosive - Composition B (RDX/TNT 60/40)-type explosive.

BASIC TECHNICAL CHARACTERISTICS:

- Number of modules per set: 1;
- Number of fragments per module: approx. 1200;
- Explosive content per module: 17 kg.

BLASTING PARAMETERS:

- Effective fragment range: up to 100 m;
- Maximum height of impact at 100 m distance from the charge: up to 3 m;
- Width of impact sector at 100 m distance from the charge: 7 to 20 m;
- Average number of fragments per unit area: approx. 18 frag./m^2.

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WIDE-EFFECT EXPLOSIVE CHARGE

DESCRIPTION:
Wide-Effect Explosive Charge is designed for controlled engagement of enemy personnel, targeting armoured vehicles by damaging their observation and targeting instruments, lights, and windows, as well as providing protection for anti-tank minefields.
Wide-Effect Explosive Charge is a component of the engineer barrier construction system, which falls under the domain of counter-mobility and enhances the survivability of military forces. It is constructed with an aluminium-composite body filled with steel balls and an explosive - Composition B (RDX/TNT 60/40)-type explosive.

BASIC TECHNICAL CHARACTERISTICS:
- Number of modules per set: 2;
- Number of fragments per module: approx. 2500;
- Explosive content per module: 6 kg.

BLASTYING PARAMETERS:
- Effective fragment range: up to 30 m;
- Maximum height of impact at 30 m distance from the charge: up to 2 m;
- Width of impact sector at 30 m distance from the charge: 30 to 45 m;
- Average number of fragments per unit area: approx. 45 frag./m^2.

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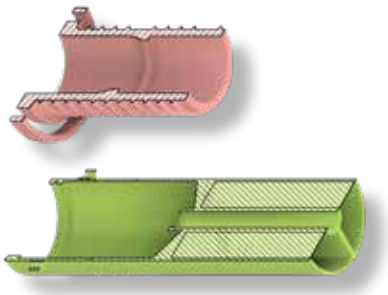
SMALL CUMULATIVE CHARGE"MIKRUS"

DESCRIPTION:
The Small Neutralization Charge for Unexploded Ordnance (UXO/ERW/AXO) is utilized in demining tasks and the disposal of ammunition in various conditions (unexploded ordnance, duds etc.) and Improvised Explosive Devices, which pose a tangible threat to both the military and civilian personnel. It enables the destruction of Explosive Ordnance (EO) using the low order deflagration method, which allows for limited damage and the use of a smaller amount of explosive. UXO Small Neutralization Charge is characterized by its universality, ease of use in a given task, and a wide range of applications. It can be successfully utilized in crisis scenarios (e.g., sealing a high-pressure gas cylinder leak) or in typical mine-clearing operations (piercing metal plates, or demolition of structures made from various materials such as concrete, brick, reinforced concrete).

BASIC TECHNICAL CHARACTERISTICS:

- Operating principle: Shaped charge;
- Basic liner type: Copper liner;
- Penetration against RHA: Not less than 10mm RHA;
- Type of Explosive Used: Plastic explosive;
- Mass of plastic explosive used: 20 to 60 grams;
- Possibility of using the following means to initiate the charge:
  - Electric detonator
  - Blasting cap
  - Non-electric detonators



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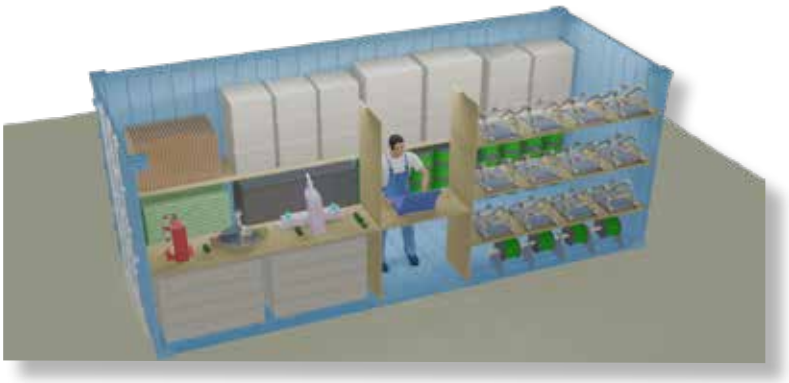
AMMUNITION CONTAINER PRODUCTION LINE



ASSIGNMENT:
Manufacture of ammunition under field conditions.

DESCRIPTION:
A 20-foot container-based production line designed for the manufacturing and assembly of the Universal High-Explosive Dual Purpose Grenade (Polish abbreviation UGPO) or other components utilizing additive manufacturing technology. The production line features an independent power source and a materials storage facility, enabling continuous operation in any location.

BASIC TECHNICAL CHARACTERISTICS:

- UGPO production capabilities up to 1500 per month dependent on the variant);
- Personel 2 persons;
- Set up time up to 30 mins.;
- Production capability time Operation up to 7 days.

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FIELD FORTIFICATION ADDITIVE MANUFACTURING

ASSIGNMENT:
Production of fortification elements under field conditions.

DESCRIPTION:
The ability of engineering units to produce concrete elements directly in the field, close to their intended placement, significantly reduces the logistical burden associated with transporting components needed for fortification or road and bridge construction. Moreover, during peacetime training, military engineering units could manufacture the required fortification- or road and bridge elements, creating a stockpile that could be readily deployed in emergencies. This solution would enable the Polish Armed Forces to enhance their survivability capabilities at the mere cost of the materials necessary for producing these elements.

BASIC TECHNICAL CHARACTERISTICS:

- Capability to produce fortification structures in the field with resistance classes of A5 and C5 according to STANAG 2280;
- Ability to construct road-, bridge-, and residential infrastructure under field conditions;
- Capability to restore damaged road and bridge infrastructure in operational areas;
- Transportable by land, rail, and air;
- Printing speed of up to 6 tons of working mixture per hour;
- Concrete mix achieving a compressive strength of at least 50 MPa and a flexural strength of 3 MPa within 24 hours;
- Operational crew requirement of no more than 6 soldiers.

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ANTI-DRONE PONCHO SYSTEM

DESCRIPTION:
The Anti-Drone Poncho is a specialized system designed for the individual protection of soldiers. It provides shielding against detection across various electromagnetic spectrum ranges, including visible light, near-infrared, thermal imaging, and modern night vision systems. Engineered for effectiveness, the poncho ensures that when deployed, it maintains camouflage effectiveness without restricting the soldier's mobility. In its transport form, the poncho is lightweight and compact, minimizing the burden on the soldier's gear.

The development of the project involved:

miranda

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THERMAL AND ANTI-RADAR LININGS

DESCRIPTION:
Thermal and anti-radar linings are employed as internal layers within military hangar walls. Depending on the construction type, these linings not only enhance protection against external weather conditions for military equipment and personnel but also prevent detection using thermal imaging and radar systems, including Synthetic Aperture Radar (SAR) of the objects within the hangar. The technological solutions incorporated in the linings leverage the composite material's capability to absorb and disperse microwave radiation energy, ensuring superior protection.

The development of the project involved:

miranda

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MS-60 SIGNAL MINE MODIFICATION

DESCRIPTION:
Modification of the MS-60 signal mine with the following parameters:

- effective length of a single decoy 10 m or 20 m for a double decoy;
- possibility of using signal cartridges, illuminating cartridges as well as IR - 26 mm and 26.5 mm (NATO), or any other effector that can be activated by an impact mechanism;
- use of much easier and more convenient to use fuses, maintaining the advantages of very low visibility even in very good weather conditions;
  • manufacture of uniform setting and fuses pins from light alloys;
  • improvement of the method of driving the pins into the ground without the need for additional tools;
  • easy adjustment of the length of the guy wires;
  • improved safety of use through the use of two levels of protection;
  • the solution used allows the complete mine (with a cartridge inserted) to be carried without fear of accidental activation.

The development of the project involved:

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RECONNAISSANCE AND SURVEILLANCE DRONE (EAGLEOWL)

OPERATIONAL APPLICATIONS:
EagleOWL can be widely used in reconnaissance, strike, and logistics operations.

- offensive strikes
- reconnaissance and observation using a dual camera with thermal imaging
- fire support
- logistical support
- improved method of driving pegs into the ground without the need for additional tools;
- easy adjustment of the length of the straps;
- improved safety of use through the use of two levels of protection;
- the solution used allows the complete mine (with the cartridge inserted) to be carried without fear of accidental activation.

Convenient transport in a box adapted to the drone. Possibility of integrating optoelectronics adapted to the user's needs.

Mission control system:
- flight path planning,
- MAVLink protocol support

The development of the project involved: JPBC

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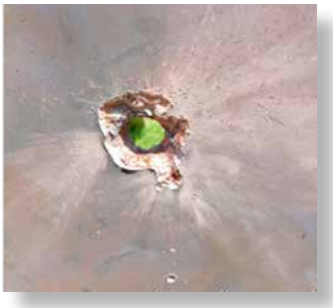
FPV DRONE WITH LARGE ANTI-TANK AND FRAGMENTATION CHARGE

OPERATIONAL APPLICATIONS:
FPV drones are lightweight and versatile operational tools controlled by radio or fiber optics:

- Offensive strikes
- Reconnaissance and observation
- Fire support
- Defensive operations and logistics



The development of the project involved: JPBC

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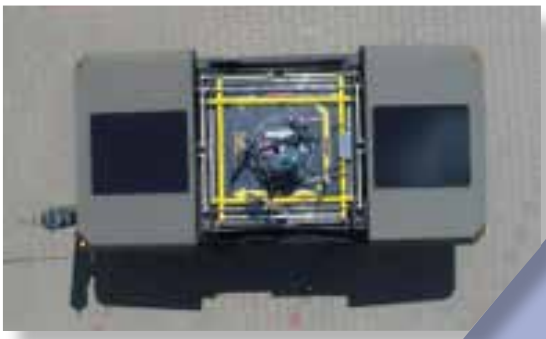
STATIONARY DOCKING STATION (OWLNEST)

MOPERATIONAL APPLICATIONS:
OWLNEST docking stations together with the EagleOWL drone have operational potential in various areas, such as:

- Automatic patrol and reconnaissance missions
- Tracking land unit movements
- Logistical support
- Data processing

COMBAT CAPABILITIES
Ability to store UGPO charges in the cargo box



The development of the project involved: JPBC

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MOBILE DOCKING STATION (MobiOWL)

OPERATIONAL APPLICATIONS:
MobiOWL docking stations together with the EagleOWL drone have operational potential in various areas, such as:

- Dynamic patrol and reconnaissance missions
- Tracking land units movement
- Offensive operations

MobiOWL is a dedicated solution for uniformed services, increasing the effectiveness of field operations using unmanned aerial vehicles.

The development of the project involved: JPBC

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