

devices for safe storage
and transport
of hazardous
materials





Dynamic detonation tests

Resistance to heavy fragments

Integration with BHS System

Experience & knowledge

Already at the beginning of the 1990s' JAKUSZ conducted **tests on resistance to explosion** of various designs. Initially, these studies concerned resistance of safes and bank vaults to effects of explosives used during a hypothetical burglary attempt. With the changing needs of its customers, the Company has successively expanded its range.

Experience in metal processing and concrete prefabrication allowed us to expand the portfolio of the Company products with various structures used for widely understood security purposes.

The Company has designed and tested many types of warehouses, armoured checkpoints, and containers for isolation, safe transport and storage of hazardous materials.

A consistent expansion of own research capacities, development of new technologies in cooperation with research institutes, as well as responding to changing needs of our customers led to the current range of products used for protection against consequences of explosion.

Design & implementation

The Company has its **own engineering and technological team**. We design, manufacture and test a wide range of products for isolation, transport, and storage of explosives.

The devices designed and constructed by JAKUSZ undergo a number of tests performed either in house or by independent institutions. Furthermore, all prototypes have to pass dynamic detonation tests and are certified by research institutes, e.g., by the Military Institute of Armoured and Automotive Technology, the Military Institute of Armament Technology, or the Institute of Industrial Organic Chemistry.



Tests and certificates

The scope of performed tests includes:

- traction tests for products installed on trailers or vehicles;
- pressure tests;
- detonation tests (performed on a customer's request also during acceptance tests);
- verification of products resistance to weather conditions;
- necessary tests concerning safety and ergonomics of use;
- tests for conformance with ADR;
- tests for conformance with appropriate regulations.

Protection – isolation and transport

Devices designated for isolation, storage and transport of explosives:

A. Explosion-proof containers for isolation of suspicious objects and reduction of results of a possible explosion

Devices from this category are only intended to limit consequences of explosion and direct the detonation energy. This group includes:

1. **Explosion-proof bins** – reinforced bins imitating litter bins, into which explosives can be thrown by a possible terrorist. These bins can be installed at locations where large groups of people gather, such as airports, shopping arcades, public utility buildings, or stadiums.

2. **Ballistic shields** – cylinders of metal or special materials which are placed over a suspicious object at a location of its finding for immediate protection against an uncontrolled explosion. The ballistic shields can be used by bomb technicians.

B. Containers for isolation and transport of hazardous materials – luggage, parcels, or war remnants.

Containers are installed on trailers, mobile platforms, or chassis. It is the most extensive line of explosion-proof containers, meeting various needs of our customers. Individual containers are resistant to the explosive detonation of 20 g to 10 kg, expressed as TNT equivalent.



Containers classified by their design

The explosion-proof containers from this category are used for transport of hazardous items and protect their surroundings against an uncontrolled explosion, contrary to detonation chambers designated for controlled, repeatable destruction of combat means.

Containers classified by their design:

1. “Open” explosion-proof containers – portable and providing protection against much larger explosive material equivalent contrary to blast-resistant bins; prevent horizontal projection of fragments and direct the detonation wave upwards, protecting their nearest surroundings.

2. Ventilated closed explosion-proof containers – enable emission of gases generated during detonation out from the container through special openings.

Ventilated containers may be resistant to pure charge of explosive materials, and to:

- light fragments- generated by objects from parcels, shipments or luggage;
- heavy fragments – generated by combat ammunition.

3. Gas-tight explosion-proof containers – retaining post-detonation gases in a gas-tight structure of the container for a specific time, enabling their sampling and toxicity analyses in a laboratory.

Their gas-tight design protects people and the natural environment. The gas-tight containers protect against light fragments and terrorist weapon, dirty bomb or improvised explosive device (EOD) that may contain chemicals or biologically active agents.

The containers offered by JAKUSZ are of different sizes, from the portable ones that can be carried by one person up to containers installed on vehicle chassis or trailers.

An important feature of each such device is an option for a fast and convenient loading of hazardous material, ensured, for example, by a rotating container bottom, mobile platforms, automatic pull-out shelves, or internal conveyor belts.



Explosion-proof containers – dedicated safety & protection

The most technologically advanced container designed by the Company is a **gas-tight container EVA PLUS, with an internal shield resistant to heavy fragments from ammunition**, of a design suitable for many different applications.

The containers designed by JAKUSZ are intended for several groups of users listed below, so the container design includes their specific needs, e.g., different working methods and various hazards. Furthermore, some containers may be used in many different areas, depending on the installed accessories.

Due to their different designs, our explosion-proof containers are used by:

- **industry and laboratories;**
- **sorting centres;**
- **military engineering corps;**
- **EOD units;**
- **police bomb technicians and other security forces;**
- **airport security services;**
- **demilitarisation plants.**

Descriptions of explosion-proof containers and their parameters are presented in tables on pages 6 to 8.

A type of a carrier (a trailer or a vehicle) and accessories are selected together with a customer, and include:

- working, signalling and warning lighting;
- radio (remote) or wired control system;
- guides, supports;
- buttons for work with a robot;
- gas releasing system, sampling, and purification;
- cylinder for sampling of post detonation gases;
- a loading arm;
- an additional device positioning a load/luggage;
- an additional protection, e.g., electromagnetic, housing, tarpaulin or other type.



Detonation chambers

The Company range also includes gas-tight detonation chambers that may be used to determine detonation velocities of explosives or for destruction of hazardous materials, including combat means. The chambers are resistant to repeatable detonations of a specified explosive equivalent, and equipped with systems for gas purification and sampling.

Both detonation chambers themselves, and the gas purification systems are selected individually according to customer needs. Detonation chambers are used in research laboratories and demilitarisation plants.

Safe storage

JAKUSZ offers specialized containers for temporary or long-term storage of:

- weapons and ammunition;
- explosives;
- other combat means/initiating agents;
- unexploded ordnance (UXO);
- pyrotechnics.

Similarly as in the case of other products, the Company manufactures customised containers in accordance with the user's requirements concerning:

- container resistance class;
- design type and internal arrangement;
- auxiliary systems, such as lightning, alarm, fire prevention, monitoring, and other systems.

All warehouse structures are designed taking into account local regulations and occupational safety and work ergonomic rules.

The Company range also includes other devices reducing consequences of the explosion, such as ballistic walls, stationary warehouses or storage modules. Furthermore, the Company conducts research and implements various types of blast-proof shields, according to customer needs. JAKUSZ also offers specialist containers such as containerised rescue training simulator, sanitary containers, and sets of workshop containers.

Containers for safe storage are described in a table on page 10.



Explosion-proof containers for isolation and transport

General parameters	Airport containers	Police containers	Military containers	Laboratory containers	Industrial containers (detonation chambers)
Description / Application	Isolation of the suspicious luggage at the outside airport zone or in the sorting centers	Transport of terrorist weapon or IED's found in public places	Transport of unexploded charges or shells to the place of their neutralization	Transport of fuses and samples of explosives	Testing of explosives / destruction of combat agents
Resistance	To detonation up to 8 kg of pure charge in TNT equivalent and to light fragments coming from luggage	From 500 g up to 8 kg of explosive material in TNT equivalent and to 100 mm projectiles	To detonation up to 10 kg in TNT equivalent and to heavy fragments coming from ammunition up to 152 mm caliber	To 200 g of explosive material in TNT equivalent	To 2 kg by single detonation
Construction	Cylindrical gastight or ventilated; Loading openings adapted to luggage dimensions	Gastight preferred; Installed on trailers in the rig up to 3.5 tons or inside pyrotechnic vehicles	Ventilated / resistant to shell fragments	Containers of small dimensions for easy carrying by one or two persons	Designed individually acc. to required size, containerized or on container basis
Accessories	Positioner – integration with BHS system; Trailer or mobile platform; Automatic and control; Post-detonation gases sampling system	Pyrotechnic equipment, lighting; Post-detonation gases sampling system; remote control; compatibility with pyrotechnic robot	Loading arm; EOD equipment as per customer's request; Special trailers - heavy duty	Samples positioning insert; Trolley simplifying transport of the container; Gases sampling system	Gases cleaning system



Airport containers

Name	Resistance (TNT equivalent)	Opening dimensions (internal diameter as mm)	Luggage dimensions (length x width x height, as mm)	Type
AGA	500 g	550	500 x 400 x 250	Gas-tight
WANDA	3,5 kg	1200	900 x 400 x 270	Ventilated
VERA	5 kg	1600	900x 700 x 500	Ventilated
PAULA	5 kg	1200	1000 x 750 x 700	Gas-tight
EVA	8 kg	1600	900 x 700 x 500	Gas-tight

Police containers

Name	Resistance (TNT equivalent)	Hazardous object dimensions (length x width x height, as mm)	Type
PAULA	5 kg	1000 x 750 x 700	Gas-tight
ANKA	20 g	Without a positioning insert: D 250 / Ø 70 With a positioning insert: D 170 / Ø 35	Gas-tight
AGATA	500 g	500 x 300 x 300	Gas-tight
EVA	8 kg	900 x 500 x 700	Gas-tight
EVA PLUS with a vehicle - IRIS	5 kg/100 mm HE projectile	900 x 450 x 500	Gas-tight
MIESZKO	10 kg	800 x 700 x 700	Ventilated



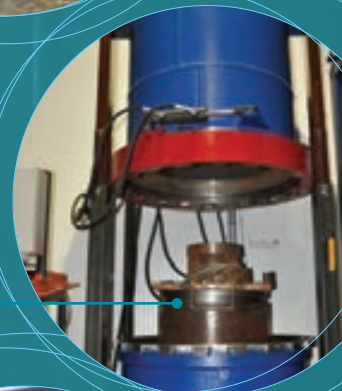


Military containers

Name	Resistance (TNT equivalent)	Weight of the set (kg)	Additional equipment	Type
WANDA S	3,5 kg	1450 container only	Optionally installation on a vehicle	Ventilated
IRIS	5 kg / 100 mm HE projectile	16 000	X-ray; EOD protective suit; Robot, hooks, sets of ropes, etc.	Gas-tight
MIESZKO	10 kg	3000	Integrated loading arm	Ventilated
WIKTORIA	10 kg/152 mm HE projectile	5000 with a trailer	A trailer with a platform adapted to work with a bomb disposal robot	Ventilated

Laboratory containers

Name	Resistance (TNT equivalent)	Weight (kg)	External dimensions (length x width x height, as mm)	Intended use	Gas purifying system / sampling
ANKA	20 g	6,6	170 x 180 x 470	Transport of laboratory samples	No / Yes
ALAMAK	100 g	1600	1200 x 2500 x 2260 (closed chamber) x 3110 3110 (open chamber)	Research work; Destruction of explosives	Yes / Yes
ALA	120 g	40	350 x 390 x 590	Transport of laboratory samples	No / Yes
ANDROMEDA	2 kg	22 000	6060 x 3100 x 3000	Research work; Destruction of explosives	Yes / Yes



Containers for safe storage of hazardous materials

Name	External dimensions (length x width x height, as mm)	Type of stored hazardous materials	Quantity of stored materials (TNT equivalent)	Resistance	Net weight
ISS MODULES	620 x 410 x 850 (for a single two-chamber module)	Pyrotechnical mixtures, explosives, sensitive substances	2.5 kg (for a single chamber)	In the case of explosion, storage modules do not transfer detonations to neighbouring slots	360 kg
KMMW	Container 1 C 6058 x 2438 x 2438 1 CC container 6058 x 2438 x 2591	Blasting, plastic explosives initiating agents, UXO, small arms, combat and drill ammunition/containers are used for ammunition disposal processes	Up to 50 kg	A warehouse protects its surroundings against internal detonation of explosives, UXO and external gunfire with ammunition or mortar ammunition	16 500kg
STOLEM	6058 x 2438 x 2591 diameter: 2400	High explosives, plastic explosives, initiating agents, collected unexploded ordnance	Max 10 kg	construction allows safe transport of hazardous materials and objects on public roads	24 000 kg
PIRO	4900 x 2500 x 2510	Entertainment pyrotechnical materials, explosives included in hazardous material classes according to ADR used in various industry sectors (e.g., pharmaceutical)	Up to 1000 kg net of pyrotechnical mixture	Explosion energy and discharge of gases through a light roof surface or door	14 000 kg
Warehouse for storage of weapons and ammunition	ISO 10", 20" or 40" container	Weapons and ammunition according to user's specification	Individually specified	Containers made of armour steel of a specified class according to user's requirements	



JAKUSZ – well-established position in the global defence market

The Company offers a wide range of containers, which are being delivered to customers from all over the world. We are cooperating with authorised companies providing technical support and maintenance servicing in the Customer country.

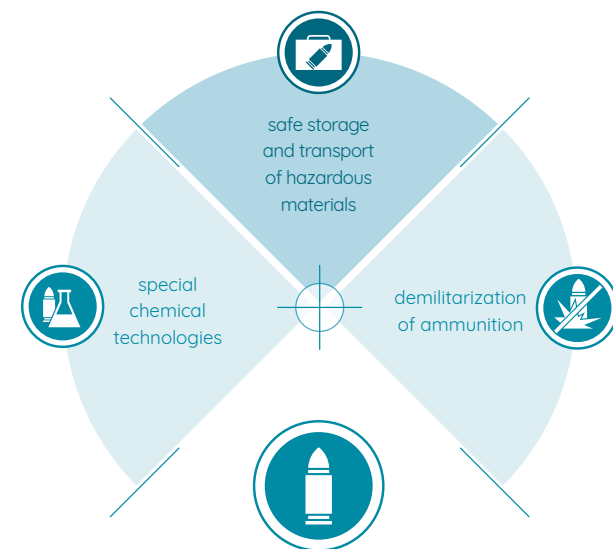
For the sold containers, the Company guarantees supervision during start-up, two-level trainings (for a maintenance technician and an end user), upgrade, post-guarantee support, and access to spare parts throughout their life.

JAKUSZ Sp. z o.o. is a Polish company with well-established position on the defence market, and with 35 years of experience in design and construction of special devices and technologies.

Main advantages of the Company include its own design and production and laboratory facilities, comprehensive solutions, and experienced engineering team.

Our portfolio covers three main business areas: containers for isolation, safe storage & transport of hazardous materials, ammunition disposal and special chemical technologies.

The Company achievements include successful projects in Asia, Europe, North America, Africa and Middle East. We were also successful in execution of research and development programmes for the European Space Agency concerning oxidising agents and propellants (liquid and solid).





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