

Instruction Manual for
PyroBubbles® - **Test Bench 800**
for lithium-ion and lithium-metal cells and batteries



Read these instructions carefully before using the system,
and retain for future reference.

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1 Product Description

1.1 Technical data

		Test Bench 800
Item number		2502
External dimensions of container in mm (L x W x H)		1199 x 799 x 1252
Internal dimensions of container in mm (L x W x H)		1076 x 676 x 1100
Container material		Stainless steel
Sealing material		Ethylene-propylene-diene rubber (EPDM)
Safety valves	Quantity	2
	Bolted joint diameter in cm (inches)	2,54 (1")
	Opening pressure in kPa	21 (0,21 bar, 3 psi)
Filler material		PyroBubbles® bulk PyroBubbles® Packing Cushion Cloth Small PyroBubbles® Packing Cushion Cloth Large

1.2 Components

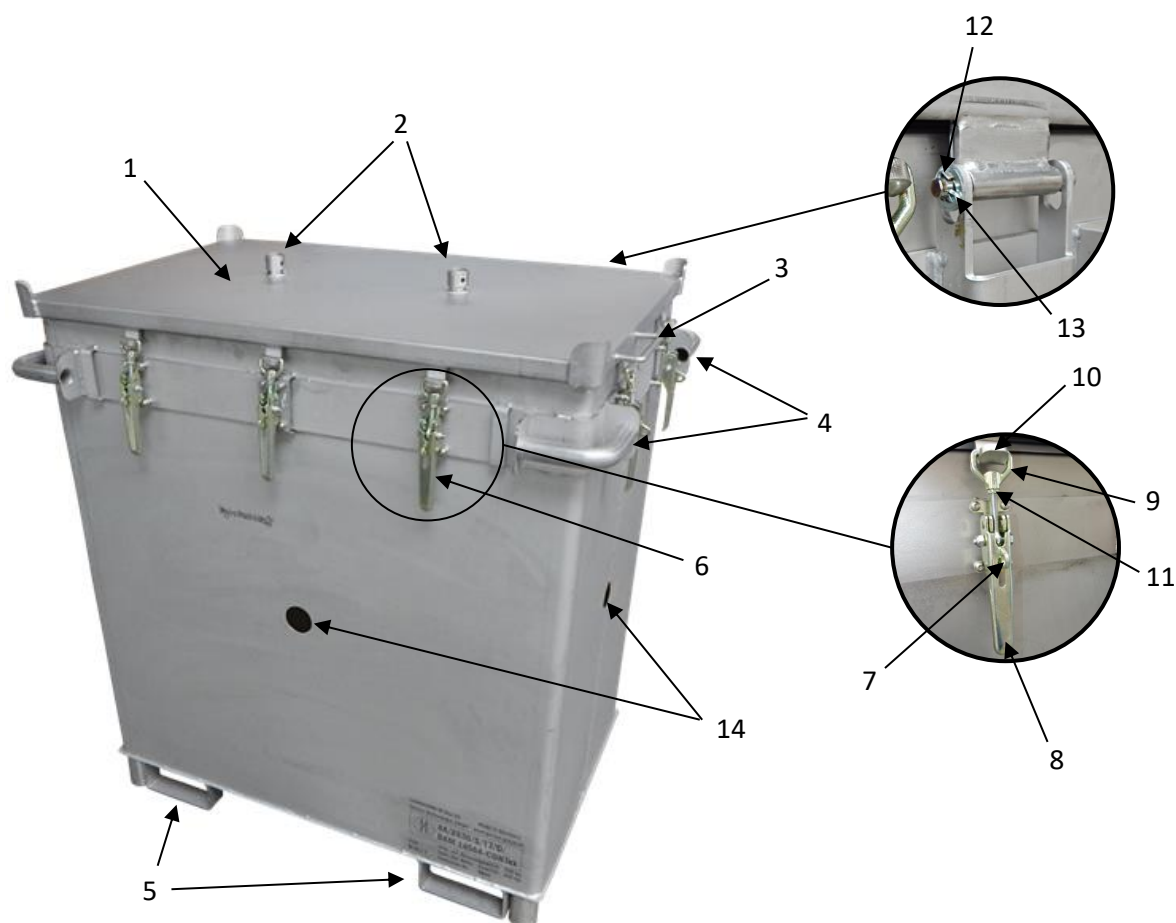


Fig. 1: Test Bench 800 in closed condition

- | | | | |
|---|-----------------|----|---|
| 1 | Cover | 9 | Locking eyelet |
| 2 | Safety valve | 10 | Locking hook |
| 3 | Handle | 11 | Locknut |
| 4 | Collision guard | 12 | Hinge pin (only for version with hinged cover) |
| 5 | Guide | 13 | Hinge cotter pin (only for version with hinged cover) |
| 6 | Toggle catch | 14 | Opening for cable gland |
| 7 | Locking bolt | | |
| 8 | Locking lever | | |

2 Safety instructions

2.1 Intended use

The container is used to contain lithium-ion and lithium-metal cells and batteries, which are operated in the container within their performance limits. The integrity of the container shall be checked before each use. It must be ensured that all openings are tightly closed or provided with the appropriate attachments such as safety valves or suction device.

Attention

The container is based on a UN-approved packaging for the transport of dangerous goods. Due to structural changes, the carriage of dangerous goods on public roads in this test bench container is prohibited.

2.2 Information about PyroBubbles®

PyroBubbles® are multi-cellular hollow glass spheres, which are not dangerous (dust is not respirable) in their solid form (delivery condition). If PyroBubbles® are ground or pulverized mechanically, continuous contact with high concentrations of respirable dust can impair lung functioning. The general dust limits of 1.25 mg/m³ for respirable (A dust) and 10 mg/m³ for inhalable (I dust) fractions must be observed. An individual time-weighted average must not exceed the value of 3 mg/m³ for the A-dust fraction. For details, refer to TRGS 900 (or respective nationally applicable technical rules for hazardous substances). If the dust concentration at the place of work exceeds the specified occupational exposure limit values, approved and suitable respiratory protection must be used (filter type P2).

It is recommended to wear eye protection in the case of dust formation, and to wear gloves in the case of skin contact.

PyroBubbles® that no longer correspond to their condition at the time of delivery, must be disposed of in accordance with the disposal instructions (see section 5) and shall not be used further, because they no longer meet the requirements with respect to sorption capacity and thermal insulation.

3 Application

Attention

Before each use, check the integrity of the container and the other components such as the rubber seal, the toggle catches and the safety valves.

3.1 Transport of the container

3.1.1 Safety instructions



Warning

Risk of injury from falling parts

Injuries ranging from severe to fatal

When moving containers, use only suitable lifting gear attached to the designated lifting points. No person must be allowed to linger within the working area of the lifting gear.

3.1.2 Transport instructions

Make sure that all the locking eyelets of the toggle catches are properly hooked onto the locking hooks, and that all toggle catches are closed.

Lift the container only by means of the guides provided, and use only appropriate lifting gear. A pallet truck can be generally used for moving.

To increase static friction, non-slip mats must be placed beneath the feet of the transport container. The load is secured by lashing it down with tensioning straps, which are strapped across the cover.

The container is not suitable for a dangerous goods transport of lithium-ion batteries.

3.2 Storage of the container

3.2.1 Safety instructions



Warning

Risk of injury from falling parts

Injuries ranging from severe to fatal

When moving containers, use only suitable lifting gear attached to the designated lifting points. No person must be allowed to linger within the working area of the lifting gear.

3.2.2 Storage instructions

PyroBubbles® must be stored in a dry location.

The transport container should be stored at temperatures between +5°C and +25°C, protected from direct solar radiation and in a dry area, to maintain the sealing properties of the rubber seal in accordance with DIN 7716 standard (Rubber products: Requirements for storage, cleaning and maintenance).

3.3 Opening the container

3.3.1 Safety instructions



Caution

There is a risk of squeezing or jamming fingers/hands in the toggle catches

Slight injuries to fingers and hands

Wear work gloves. Do not insert your fingers or hands between the locking bolt and the locking lever.

3.3.2 Work procedure

1. Press the locking bolt of the toggle catch downwards, and at the same time move the locking lever upwards.
2. Remove the locking eyelet from the locking hook.
3. Push the locking lever back downwards until the locking bolt engages by itself.
4. Repeat steps 1 through 3 for all toggle catches.
5. Using the side handle, open the cover carefully.

3.4 Insertion of the battery into the container

3.4.1 Safety instructions



Warning

Hazards due to electric voltage

Injuries ranging from severe to fatal

Cover the terminals of the battery with electrically insulating materials. Wear adequately electrically insulating protective equipment.

Attention

Respiratory protection (filter type P2) is recommended, to prevent damage to the respiratory organs by the dust that may be formed.

3.4.2 Application instructions

The distances of the battery to the container walls depend on the battery (construction type, energy content, etc.). In all cases, ensure a minimum distance of 12 cm to the container walls and 20 cm to the bottom and cover.

3.4.3 Work procedure

1. Open the container (see section 3.2.2).
2. Fill a minimum layer of 20 cm of PyroBubbles® into the container.
3. Place the battery into the container in such a way that a minimum distance of 12 cm is ensured to all sides of the container walls and 20 cm to the container cover.
4. Connect all required cables and other leads to the battery.
5. Pass the cables and leads through the openings in the container walls out of the container.

Attention

To ensure the functionality of the protection concept, all openings must be tightly closed.

6. Fill PyroBubbles® packing cushions cloth small and large into the container, up to the top edge.

Attention

Only when the transport container is completely filled with PyroBubbles® is an adequate level of protection ensured.

7. Close the container (see section 3.5).

3.5 Sealing the container

3.5.1 Safety instructions



Caution

Danger of pinching between cover and transport container

Slight injuries to fingers and hands

Wear work gloves Do not insert your fingers or hands between the cover and the container.



Caution

There is a risk of squeezing or jamming fingers/hands in the toggle catches

Slight injuries to fingers and hands

Wear work gloves. Do not insert your fingers or hands between the locking bolt and the locking lever.

3.5.2 Work procedure

1. Throw the locking eyelets in such a way, that they form a right angle with the container wall.
2. Using the side handle, close the cover.
3. Press the locking bolt of the toggle catch downwards, and at the same time move the locking lever upwards.
4. Place the locking eyelet over the locking hook.
5. In the unclamped condition, the locking lever should be at an angle of approximately 45° to the container wall. It may be necessary to alter the clamping stroke of the toggle catch (see section 3.7).
6. Repeat steps 3 through 5 for all toggle catches.
7. Push the locking levers of all toggle catches downwards until the locking bolt engages by itself.

Attention

Make sure that the openings of the cable glands are tightly closed.

3.6 Removing the battery

3.6.1 Safety instructions

If the container shows any signs of deposits, discoloration or a piercing smell, you must assume that the electrolyte has leaked or there has been a thermal runaway in the battery.



Danger

Danger of poisoning due to toxic, partially odourless gases and toxic substances

Injuries ranging from severe to fatal

In the event of electrolyte leaking from the cell or battery, or a thermal runaway, the transport container must be opened only by personnel wearing protective equipment appropriate to the type of hazardous substance involved.



Danger

Danger of poisoning by inhalation of contaminated dust

Injuries ranging from severe to fatal

In the event of electrolyte leaking from the cell or battery, or a thermal runaway, the transport container must be opened only by personnel wearing protective equipment appropriate to the type of hazardous substance involved.



Warning

Risk of explosion due to explosive gases

Injuries ranging from severe to fatal

In the event that the cell or battery suffers a thermal runaway, avoid ignition sources. If possible, provide sufficient ventilation.



Warning

Hazards due to electric voltage

Injuries ranging from severe to fatal

Cover the terminals of the battery with electrically insulating materials. Wear adequately electrically insulating protective equipment.

3.6.2 Work procedure

1. Open the transport container (see section 3.2.2).
2. Remove the PyroBubbles® by removing the cushions, skimming or vacuuming them off until the battery is visible.
3. Remove the battery.

3.7 Changing the clamping stroke of the toggle catches

3.7.1 Work procedure

1. Loosen the locknut.
2. Turn the locking eyelet counterclockwise to reduce the clamping stroke. Turn the locking eyelet clockwise to increase the clamping stroke.
3. Now tighten the locknut.

3.8 Removing and fastening the cover

3.8.1 Safety instructions



Caution

Risk of injury when lifting the cover

Slight to moderate injuries to the upper body

Always employ two persons to move the cover.

3.8.2 Work procedure removing

1. Disengage the toggle catches (see section 3.2.2).
2. On each hinge pin, bend the wire ends of a hinge cotter pin together.
3. Remove the hinge cotter pin and the hinge pins.
4. Lift the cover off.

3.8.3 Work procedure fastening

1. Place the cover centrally on the transport container.
2. Insert the hinge pins through the slotted holes in the container and the holes in the cover.
3. Place a washer on the hinge pin and secure it by inserting a cotter pin. Bend back the wire ends.

Attention

Always use new cotter pins with a sufficient total diameter and sufficient length.

4 Maintenance and Repair

4.1 Maintenance

4.1.1 Safety instructions



Warning

Risk of poisoning due to toxic substances that have leaked from the battery

Injuries ranging from severe to fatal

In the event of contamination due to substances leaking from the battery, wear protective equipment appropriate to the hazardous substances involved.

4.1.2 Maintenance instructions

Contamination by substances leaking from the battery on to the containers must be removed. For this purpose, use only cleaning materials that do not attack the material of the container (stainless steel) or the sealing rubber (EPDM).

PyroBubbles® can generally be reused, provided that they show no visual changes and the granules are odor-neutral.

The service life of the sealing rubber is approximately 8 years.

4.2 Repairs

In the event of damage to the container, the protective effect may no longer be ensured, depending on the type and severity of the damage. Maintenance and repairs have to be carried out by the manufacturer or by technicians authorized by the manufacturer only.

5 Waste Disposal/Environmental Protection

The materials used in manufacturing the container are recyclable and can be recycled through commonly available recycling programs.

Uncontaminated PyroBubbles® can be forwarded to commonly available recycling programs.



Danger

Danger of poisoning by inhalation of contaminated dust

Injuries ranging from severe to fatal

Use protective equipment suitable for the type of contamination involved.

Contaminated PyroBubbles® must be properly disposed of in accordance with the applicable national regulations and in accordance with their respective contamination.

6 Contact Information

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