

## Instruction Manual for

*PyroBubbles®* - **Storage Box 30**

*PyroBubbles®* - **Storage Box 90**

*PyroBubbles®* - **Storage Box 220**

*PyroBubbles®* - **Storage Box 280**

*PyroBubbles®* - **Storage Box 520**

for lithium-ion and lithium-metal cells and batteries



Read these instructions carefully before use and retain for future reference.

## Contents

|       |                                                           |    |
|-------|-----------------------------------------------------------|----|
| 1     | Product Description.....                                  | 3  |
| 1.1   | Technical data.....                                       | 3  |
| 1.2   | Construction .....                                        | 4  |
| 2     | Safety Instructions.....                                  | 5  |
| 2.1   | Proper intended use .....                                 | 5  |
| 2.2   | Hazard potential of lithium ion cells and batteries ..... | 5  |
| 2.3   | Information about PyroBubbles® .....                      | 5  |
| 3     | Use.....                                                  | 6  |
| 3.1   | Storage.....                                              | 6  |
| 3.1.1 | Safety Instructions .....                                 | 6  |
| 3.1.2 | Instructions for storage without hazardous content.....   | 7  |
| 3.1.3 | Instructions for storage with hazardous content .....     | 7  |
| 3.2   | Packaging the hazardous goods .....                       | 7  |
| 3.2.1 | Safety Instructions .....                                 | 7  |
| 3.2.2 | Workflow.....                                             | 8  |
| 3.3   | Removing the hazardous goods .....                        | 9  |
| 3.3.1 | Safety Instructions .....                                 | 9  |
| 3.3.2 | Work procedure .....                                      | 9  |
| 3.4   | Transporting the container.....                           | 10 |
| 3.4.1 | Safety Instructions .....                                 | 10 |
| 3.4.2 | Transport instructions.....                               | 10 |
| 4     | Maintenance and Repair .....                              | 11 |
| 4.1   | Maintenance.....                                          | 11 |
| 4.1.1 | Safety instructions .....                                 | 11 |
| 4.1.2 | Maintenance and Cleaning Instructions .....               | 11 |
| 4.2   | Repairs .....                                             | 11 |
| 5     | Waste Disposal/Environmental Protection.....              | 11 |
| 6     | Spare Parts .....                                         | 12 |
| 7     | Contact Information .....                                 | 12 |
| 8     | Customer Service.....                                     | 12 |

# 1 Product Description

## 1.1 Technical data

|                                                              | Storage Box<br>30                                | Storage Box<br>90 | Storage Box<br>220 | Storage Box<br>280 | Storage Box<br>520 |
|--------------------------------------------------------------|--------------------------------------------------|-------------------|--------------------|--------------------|--------------------|
| Article Number                                               | 2306                                             | 2307              | 2308               | 2309               | 2310               |
| External dimensions of container in mm (L x W x H)           | 600 x 400 x 800                                  | 800 x 600 x 800   | 1200 x 800 x 800   | 1200 x 1000 x 800  | 1665 x 1480 x 910  |
| Internal dimensions of container in mm (L x W x H)           | 363 x 213 x 395                                  | 563 x 413 x 395   | 1013 x 563 x 395   | 1013 x 743 x 373   | 1245 x 1045 x 400  |
| Ground clearance in mm                                       | 150                                              |                   |                    |                    | 120                |
| Content of inner containers in L                             | 30                                               | 90                | 220                | 280                | 520                |
| Load capacity in kg                                          | 100                                              | 200               | 400                | 400                | 400                |
| Net weight in kg (including PyroBubbles®) Painted/galvanized | 71 / 86                                          | 115 / 122         | 196 / 206          | 234 / 247          | 300 / 315          |
| Stackable                                                    | triple                                           |                   |                    |                    | no                 |
| Outer container                                              | Steel                                            |                   |                    |                    |                    |
| Inner container                                              | Steel                                            |                   |                    |                    |                    |
| Filler material                                              | PyroBubbles® bulk<br>PyroBubbles® PE filler pads |                   |                    |                    |                    |
| PyroBubbles® weight in kg (± 10%)                            | 15                                               | 29                | 56                 | 72                 | 220                |

## 1.2 Construction



Fig. 1: Storage Box 220 in opened state (as an example)

- |   |                                        |    |                                                                   |
|---|----------------------------------------|----|-------------------------------------------------------------------|
| 1 | Outer container                        | 7  | lifting grip                                                      |
| 2 | Inner container                        | 8  | Helical torsion spring (not at Storage Box 520)                   |
| 3 | Cover with PyroBubbles® PE filler pads | 9  | Lid support (only for Storage Boxes 220, 280 and 520)             |
| 4 | Stacking corner                        | 10 | Bracket for lid support (only for Storage Boxes 220, 280 and 520) |
| 5 | Interspace with PyroBubbles® fill      |    |                                                                   |
| 6 | Toggle catch (lockable)                |    |                                                                   |

## 2 Safety Instructions

### 2.1 Proper intended use

The storage container is used for storing lithium-ion and lithium-metal cells and batteries. The storage container shall be used only in an undamaged and unmodified condition. The integrity of the storage container shall be checked before each use.

### 2.2 Hazard potential of lithium ion cells and batteries

With today's manufacturing standards, it can be assumed that lithium-ion cells and batteries, when properly used and handled, are safe. However, damage can lead to an irreversible, destructive reaction, a so-called thermal runaway. Such damage could be, for example:

- mechanical damage
- heat stress
- overcharging
- outer short circuit
- total discharge
- ageing (dendrite formation)

Such damage can cause the cell to heat up, resulting in a decomposition reaction of cell components. This decomposition reaction in turn leads to further heating, which then causes the decomposition process to accelerate in an uncontrolled manner. In combination with the high temperatures of the cell, the large quantities of toxic and flammable gases formed can lead to severe fire events. This intense release of heat can consequently cause thermal runaway in the adjacent cells, so that under certain circumstances the entire battery reacts.

The escaping gases include carbon monoxide (CO), hydrogen (H<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>). It is also possible that hydrogen fluoride (HF) escapes, which can react with the air humidity to form hydrofluoric acid. If the escaping reaction gas does not ignite, it can mix with the air oxygen to form an explosive atmosphere.

Due to the high hazard potential ensuing from damage that may not always be visible from the outside, we recommend that batteries with unknown condition should always be stored in corresponding safety containers.

### 2.3 Information about PyroBubbles®

PyroBubbles® are multi-cellular hollow glass spheres, which are not hazardous in their solid form (delivery condition). Continuous contact with high concentrations of respirable dust can impair lung functioning. The general dust limits of 1.25 mg/m<sup>3</sup> for respirable (A dust) and 10 mg/m<sup>3</sup> for inhalable (I dust) fractions must be observed. An individual time-weighted average must not exceed the value of 3 mg/m<sup>3</sup> 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 Use

#### Caution

Before each use, check the integrity of the storage container and the filler material.

#### 3.1 Storage

##### 3.1.1 Safety Instructions



#### **Danger**

Danger of poisoning due to toxic, partially odourless gases

#### **Injuries ranging from severe to fatal**

In the event that the cells or batteries suffer a thermal runaway, leave the hazardous area as quickly as possible.



#### **Danger**

Danger of explosion due to explosive gases

#### **Injuries ranging from severe to fatal**

In the event that the cells or batteries suffer a thermal runaway, avoid ignition sources. If possible, provide sufficient ventilation.



#### **Warning**

Risk of injury from falling parts

#### **Injuries ranging from severe to fatal**

When moving storage containers, do so only with suitable forklifts / pallet trucks and using the designated lifting points. No person must be allowed to linger within the working area of the forklift / lift truck.

### 3.1.2 Instructions for storage without hazardous content

PyroBubbles® must be stored in a dry location.

The storage containers should be set up on a flat surface, under a canopy.

### 3.1.3 Instructions for storage with hazardous content

When storing cells and batteries, the lid of the storage container must be kept free, so that any reaction gases that may occur can escape freely and there is no pressure build-up inside the storage container.

## 3.2 Packaging the hazardous goods

### 3.2.1 Safety Instructions



#### **Danger**

Risk of poisoning due to toxic substances escaping from cells or batteries

**Injuries ranging from severe to fatal**

Wear protective equipment suitable for the respective hazmat.



#### **Warning**

Hazards due to electric voltage

**Injuries ranging from severe to fatal**

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



#### **Caution**

Risk of pinching between the lid and container

**Slight injuries to fingers and hands**

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

### **Caution**

To prevent a short circuit via the inner container, cover the contacts on the batteries with electrically insulating materials.

### 3.2.2 Workflow

1. The lid of the storage container is delivered from the factory with at least one of the toggle catches (6) locked. Pull this toggle catch upwards and remove the screw hooks from the lid.
2. Model Storage Box 30 – 280: using the lifting grip (7), open the cover.

Model Storage Box 520: using suitable lifting devices and the lifting grip (7), open the cover.

3. Model Storage Box 220, 280 and 520: hold the lid with one hand and snap the lid support (9) into the bracket (10).
4. The lid remains standing in its open state.
5. Place the hazardous substance into the inner container.  
Optional: Fill all cavities in the inner container with PE filler pads.

#### Caution

The hazardous substance placed into the container must not protrude beyond the edge of the inner container.

6. Model Storage Box 220, 280 and 520: firmly hold the lid with and remove the lid support (9) from the bracket (10).
7. Model Storage Box 30 – 280: Close the lid using the lifting grip (7), place the screw hook of the toggle catch (6) over the edge of the cover and then tighten the catch.
8. Model Storage Box 520: Close the lid using suitable lifting devices and the lifting grip (7), place the screw hook of the toggle catch (6) over the edge of the cover and then tighten the catch.

### 3.3 Removing the hazardous goods

#### 3.3.1 Safety Instructions

If the storage container shows any signs of deposits, discolouration or a piercing smell, you must assume that the electrolytes have 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 cells or batteries, or a thermal runaway, the storage 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 cells or batteries, or a thermal runaway, the storage container must be opened only by personnel wearing protective equipment appropriate to the type of hazardous substance involved.

**Warning**

Danger of explosion due to explosive gases  
**Injuries ranging from severe to fatal**

In the event that the cells or batteries suffer 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 adequate electrically insulating protective equipment.

#### 3.3.2 Work procedure

1. Open the storage container (see section 3.2).
2. Optional: Remove the PE filler pads until the battery is visible.
3. Remove the battery. The inner container must remain in the outer container.

## 3.4 Transporting the container

### 3.4.1 Safety Instructions



#### **Warning**

Risk of injury from falling parts

**Injuries ranging from severe to fatal**

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

### 3.4.2 Transport instructions

Make sure that the storage containers are properly closed by means of the toggle catches.

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

#### **Caution**

The storage container is not suitable for transporting lithium-ion batteries in the sense of transport for dangerous goods.

## 4 Maintenance and Repair

### 4.1 Maintenance

#### 4.1.1 Safety instructions



##### **Warning**

Risk of poisoning due to toxic substances that have escaped from cells and batteries

##### **Injuries ranging from severe to fatal**

Wear protective equipment suitable for the respective hazardous substance.

#### 4.1.2 Maintenance and Cleaning Instructions

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

PyroBubbles® can generally be reused, provided that they show no visual changes and the granules are odour-neutral. Damaged PE filler pads must be replaced.

### 4.2 Repairs

Do not continue using damaged storage containers. Repairs shall be made exclusively by specialists authorized by the manufacturer.

## 5 Waste Disposal/Environmental Protection

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

Uncontaminated PyroBubbles® can be forwarded to a construction-material recycling process.



##### **Danger**

Danger of poisoning by inhalation of contaminated dust

##### **Injuries ranging from severe to fatal**

Wear protective equipment suitable for the respective contamination.

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

## 6 Spare Parts

All the information you need for ordering spare parts can be found in the spare parts list. For fast order processing, we need the following information:

- Our article number of the spare part
- Our article designation of the spare part
- Order quantity
- Designation of the container, the manufacturing number and year of manufacture

Store the spare parts in a dry and dust-free environment and protect them from frost and heat. We also recommend setting up a manual store for these parts.

We expressly point out that we have neither tested nor approved any spare parts that have not been supplied by us. The installation or attachment as well as the use of such parts may under circumstances influence the specified design features of the container.

We neither assume nor accept any warranty and/or liability for any damages whatsoever arising from the use of non-original parts and accessories.

## 7 Contact Information

Genius Technology GmbH  
Am Theresenhof 2  
15834 Rangsdorf  
+49 (0) 3375 24 609 80  
info@genius-group.de

[www.genius-group.de](http://www.genius-group.de)

## 8 Customer Service

The customer service is provided within the framework of the warranty. The warranty period is up to 1 year after the initial commissioning, for all parts except consumables. Customer service beyond this period requires a separate agreement, or, if necessary, it can be agreed with us and provided to the customer at the customer's expense.

For all technical problems, please contact us at the above address.

**Please observe all current legal regulations relating to the above points.**