

*PyroBubbles<sup>®</sup>*

**ADR-compliant system**  
for **storage, quarantine and transportation** of Lithium-Ion-batteries ranging from defective to unsafe for transportation



# The Genius Group

Genius Technologie GmbH is a company of Genius Group from Berlin Rangsdorf. Established in 2010 our team develops innovative solutions for fire protection, transportation and the storage of Lithium-Ion-batteries as well as special extinguishing systems. Our highly skilled team members know what the industry needs due to experiences made in scientific and technological areas.

Genius Entwicklungsgesellschaft works closely together with institutes and associations like BAM, MPA, Fraunhofer

Institute and others on application solutions as part of the companies R&D and subsequent approval procedure. At the same time for all our products and procedures we ensure sustainability. Customers like VW, Porsche, Mercedes Benz, Zeppelin, Audi, the European Commission, Millbrook, FEV, etc. therefore rely on our solutions. Our products are in use around the world. Our existing portfolio has also been extended by customized applications for national and international customers considering legal and economic requirements.



# PyroBubbles® the proven, patented filling agent

**Ideal filling agent for storage and transportation of Lithium-Ion-batteries (UN 3480, UN 3090)**

## FEATURES:

- approx. 8-10 times lighter than sand (approx. 230 kg/m³)
- Absorption of electrolyte (tested by BAM)
- Low thermal conductivity and electrically insulating
- Thermal and chemical stability (<1050°C)
- Specific thermal capacity of only 0.7 kJ/(kg·K), porosity 85%
- Condensation of vapour on the surface of the PyroBubbles®
- Non-flammable material (A1, DIN 4102, EN 13501)
- Protection against vibration due to fixing
- Dust-free due to PE bag
- Storable, low maintenance costs and maintenance-free
- 100% Made in Germany
- 100% ecological
- 100% available

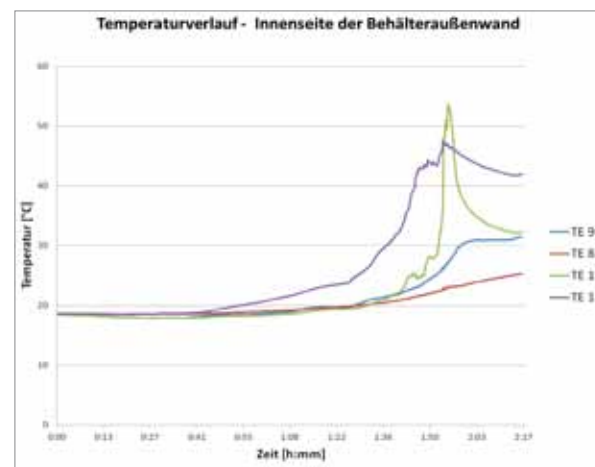
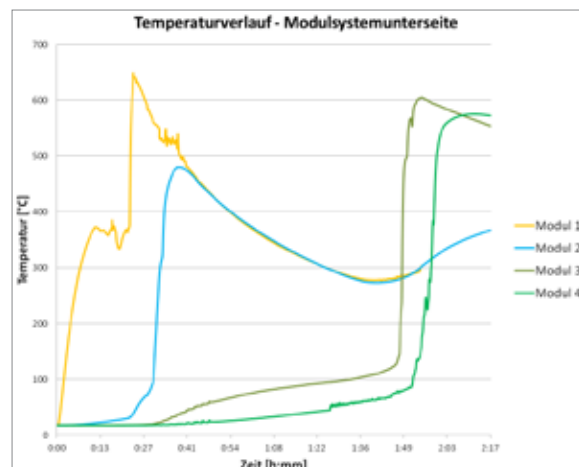
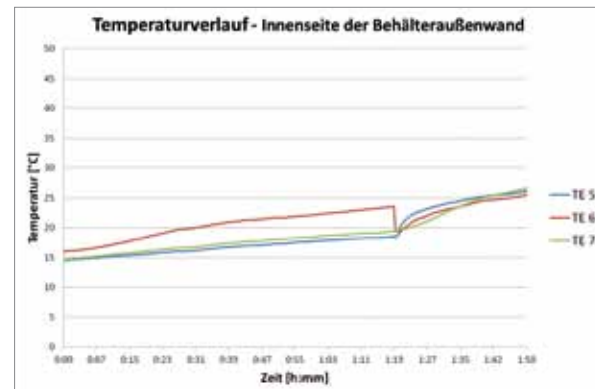
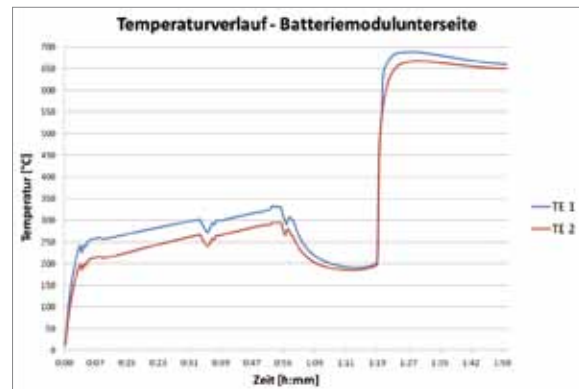




# Genius Metal transport containers

- **Safety system** for storage and transportation of Lithium-Ion-batteries weighing up to 800kg that are damaged, defective or unsafe, according to SV 376, P 91, LP 906, ADR
- **Safest protection** against thermal runaway, exothermic reactions, no danger to the environment
- **Steel containers** from S to XXL
- **Tested boxes** with UN approvals
- **Long-term reuse** of the system
- **Easy to handle**
- **Approved transportation containers** up to 800 kg, plus LP special production
- **Various specifications available**
- **Scientific support** of real fire tests
- **International references:** Volkswagen, Porsche, Audi, Vattenfall, European Union, Daimler, etc.

The temperature of the outer walls remains well below 100°C, even during and after a thermal runaway of the battery. Example: **Genius Box**



Article no.	Transport container metal	Outside dimensions (mm)	Inside dimensions (mm)	Max. size battery (mm)	Material	Volumen (l)	Max. gross weight (kg)	Max. net hazardous goods weight (kg)
2101	Genius S-Box X1 (incl. 4 bags Pyrobubbles, Premium)	799 x 599 x 734	676 x 476 x 580	436 x 236 x 180	stainless steel	187	160	66
2102	Genius S-Box X2 (incl. 6 bags Pyrobubbles, Premium)	799 x 599 x 1114	676 x 476 x 960	436 x 236 x 560	stainless steel	309	240	110
2103	Genius M-Box X1 (incl. 10 bags Pyrobubbles, Premium)	1199 x 799 x 792	1076 x 676 x 640	836 x 436 x 240	stainless steel	466	350	155
2104	Genius M-Box X2 (incl. 16 bags Pyrobubbles, Premium)	1199 x 799 x 1252	1076 x 676 x 1100	836 x 436 x 680	stainless steel	800	630	360
2105	Genius XXL-Box (incl. 50 bags Pyrobubbles, Premium)	2500 x 1484 x 1029	2376 x 1356 x 800	2136 x 1120 x 400	stainless steel	2603	1212	400
2112	Genius LP1-Box Classic (incl. 60 bags PyroBubbles, Premium)	2835 x 2135 x 957	2159 - 2699 x 1460 - 2000 x 570	2299 x 1600 x 317	galvanized steel	2986	2024	842
2113	Genius LP1-Box Basic (incl. 400 packing cushions PE large, Premium)	2835 x 2135 x 957	2159 - 2699 x 1460 - 2000 x 570	2299 x 1600 x 317	galvanized steel	2986	2024	842
2114	Genius L <sup>2</sup> - Box	1800 x 1400 x 1386	1270 x 870 x 703	1070 x 670 x 503	stainless steel	777	1608	400
2115	Genius LP <sup>2</sup> - Box	3175 x 2400 x 1349	2670 x 1900 x 590	2470 x 1700 x 390	stainless steel	2993	3960	800



Genius XXL Box



# Overview Metal transport containers

Transport, storage and quarantine box



Genius M-Box X1



Genius S-Box X2



Genius M-Box X1



Genius M-Box X2



Genius XXL-Box



# Genius Plastic transport containers

- **Safety system** for storage and transportation of Lithium-Ion-batteries that are damaged or defective, according to SV 376, P 911, LP 906, ADR
- **For E-bike batteries**, power tools, laptop and mobile batteries, automobile batteries, E-vehicle batteries, etc.
- **Safety system** for storage and transportation of Lithium-Ion-batteries that are not damaged, defective or at the end of their service life (EOL) according to SV 377, P909
- **Transportation** of prototypes according to SV 310, P910
- **Safe protection** against thermal runaway, exothermic reaction without risk to the environment
- **Standard sizes** for easy logistics, stackable up to 3.0 metres
- **Tested boxes** with UN approvals
- **Long-term** reuse of the system
- **Easy to handle**
- **X 13, X 30, Y 45 and Y 456 coding**

## Packaging methods

The degree of safety (layer thickness of PyroBubbles®) depends on the cell chemistry, weight and condition of the batteries. Filling and emptying processes are designed for easy handling. We offer three different packaging concepts for safety containers:

The powder-coated steel basket (**Advanced** and **Premium**) ensures that the minimum safety distances of the batteries from the outside of the container and the container bottom are maintained so that an optimum safety

level is guaranteed at any time. The basket is permeable to allow leaking electrolyte to escape. The **Advanced** version allows the batteries to be easily removed with the basket while the PyroBubbles® remain in the box. Cushions are placed in the **Basic** and **Premium** versions for easy handling. These cushions are wrapped in thin, needled polyethylene (PE) film and filled with PyroBubbles®. If necessary, the film dissolves and the PyroBubbles® extinguishing agent takes its full effect.

Article no.	Transport container plastic	Outside dimensions (mm)	Inside dimensions (mm)	Max. size battery (mm)	Material	Volumen (l)	Max. gross weight (kg)	Max. net hazardous goods weight (kg)
2209	Genius S-Box 1 Basic, Pure (incl. 24 packing cushion PE, small)	400 x 300 x 235	360 x 260 x 195	280 x 180 x 95	PP	18	13	8,1
2210	Genius XS-Box 1 Advanced, Pure (incl. 1 pack PB, basket open)	400 x 300 x 235	298 x 198 x 135	279 x 179 x 65	PP	8	13	6,3
2213	Genius XS-Box 1 Premium, Pure (incl. 13 packing cushion PE small, basket closed)	400 x 300 x 235	298 x 191 x 125	278 x 171 x 55	PP	7	13	4,9
2211	Genius XS-Box 2 Basic, Pure Pure (incl. 30 packing cushion PE, small)	400 x 300 x 285	360 x 260 x 245	280 x 180 x 145	PP	23	13	7,5
2212	Genius XS-Box 2 Advanced, Pure (incl. 1 pack PB, basket open)	400 x 300 x 285	297 x 195 x 190	277 x 175 x 120	PP	11	13	5,5
2201	Genius S-Box 1 Basic, Pure (incl. 62 packing cushion PE, small)	600 x 400 x 295	556 x 356 x 276	438 x 238 x 137	PP	56	45	32,5
2202	Genius S-Box 1 Advanced, Pure (incl. 1 pack PB, basket open)	600 x 400 x 295	492 x 292 x 196	438 x 238 x 137	PP	28	45	29,1
2203	Genius S-Box 1 Premium, Pure (incl. 40 packing cushion PE small, closed basket)	600 x 400 x 295	492 x 292 x 196	438 x 238 x 137	PP	28	45	26,2
2204	Genius S-Box 2 Basic, Pure (incl. 100 packing cushion PE small)	600 x 400 x 441	556 x 356 x 422	438 x 238 x 282	PP	84	45	27,9
2205	Genius S-Box 2 Advanced, Pure (incl. 2 bag PB, basket open)	600 x 400 x 441	492 x 292 x 341	438 x 238 x 282	PP	49	45	23,6
2206	Genius S-Box 2 Premium, Pure (incl. 70 packing cushion PE small, closed basket)	600 x 400 x 441	492 x 292 x 341	438 x 238 x 282	PP	49	45	18,1
2207	Genius M-Box Advanced, Pure (incl. 2 bag PB, basket open)	1230 x 1030 x 835	966 x 766 x 404	906 x 706 x 400	HDPE	299	456	291,8
2208	Genius M-Box Premium, Pure (incl. 51 packing cushion PE large, basket closed)	1230 x 1030 x 835	981 x 788 x 400	901 x 708 x 300	HDPE	309	456	277,9



# Overview Plastic transport containers

## Genius S-Box Basic



Filling with PE bags (700ml) incl. PyroBubbles®



Box filled with EOL or defective LI-batteries



Filled PE bags up to the lid edge. Dust-free, reusable

## Genius S-Box Advanced



Powder-coated metal basket at 3cm distance from inner edge of transport box



EOL, damaged, defective LI-batteries plus filling up to the lid edge with loose PyroBubbles®



Simple removal of the batteries with the basket

## Genius S-Box Premium



Permanent PyroBubble® side-layer between the side wall and metal basket



Filled with PE bags up to the lid edge. Dust-free, reusable

## Genius XS-Box Basic / Advanced



Genius XS-Box Basic



Genius XS-Box



Genius XS-Box Advanced

## Genius M-Box Advanced



Genius M-Box



Genius M-Box Advanced



## Genius storage box

The increasing energy density of Lithium-Ion-batteries and the inexorable use of these energy sources in all industrial sectors inevitably leads to a significantly increased hazard potential (transport damage, potential for spontaneous combustion, product damage, etc.). To date there are no regulations in public law (VdS 3103: 2016-05 (02)) concerning the storage and provision of lithium batteries. Genius Group has developed an innovative and safe storage system in collaboration with one of the leading manufacturers of metal boxes in Europe. The galvanized metal double walls of the special containers are filled with PyroBubbles®. The lid is

likewise securely protected with PyroBubbles®. Even batteries or cells in boxes or other storage units can be quickly and easily stored and protected in these containers. Even in the event of a thermal runaway of the stored batteries the immediate environment will not be endangered. In addition, the batteries are also protected against external influences. The **Genius Storage System** represents a simple, weather-proof, safe and flexible solution for the storage of Lithium-Ion-batteries for all industrial sectors. Elaborate separate fire protection containers and halls as well as shelters are thus no more required.



Article no.	Cushion	Outside dimensions (mm)	Material	Volumen (l)	Mass (kg)
1201	Packing unit 50 pcs. packing cushions PE small	575 x 385 x 200	PE	0,7	0,22
1202	Packing unit 5 pcs. packing cushions PE large	575 x 385 x 285	PE	8,0	2,07
9302	Packing cushions fabric, small*	240 x 90 x 30	B1 fabric	0,65	0,15
9303	Packing cushions fabric, large*	500 x 300 x 30	B1 fabric	4,5	1,00
9304	Packing cushions fabric cuboid, small*	610 x 410 x 40	B1 fabric	10,0	2,35
9305	Packing cushions fabric cuboid, large*	880 x 590 x 100	B1 fabric	52	12,0

\* Cushions not for sale. Only for use in designated systems



Article no.	Storage container	Outside dimensions (mm)	Inside dimensions (mm)	Max. size battery (mm)	Material	Volumen (l)
2306	Genius Storage Box 30	605 x 400 x 800	363 x 213 x 395	363 x 213 x 395	galvanized steel	30,5
2307	Genius Storage Box 90	805 x 605 x 800	563 x 413 x 395	563 x 413 x 395	galvanized steel	91,8
2308	Genius Storage Box 220	1216 x 805 x 800	1013 x 563 x 395	1013 x 563 x 395	galvanized steel	225,3
2309	Genius Storage Box 280	1216 x 1006 x 800	1013 x 743 x 373	1013 x 743 x 373	galvanized steel	280,7
2310	Genius Storage Box 520	1682 x 1479 x 902	1247 x 1047 x 400	1247 x 1047 x 400	galvanized steel	521
2302	Genius Storage Box 1 Standard (incl. basket open, 2 packing cushion fabric large, 40 packing cushions PE small)	595 x 390 x 380	488 x 288 x 312	488 x 288 x 312	aluminium	44
2303	Genius Storage Box 1 Premium (incl. basket closed, 3 packing cushion fabric large, 30 Packing cushions fabric small)	595 x 390 x 380	488 x 288 x 312	488 x 288 x 312	aluminium	44
2304	Genius Storage Box 2 Standard (incl. basket open, 3 packing cushion fabric large, 100 packing cushions PE small)	595 x 390 x 810	488 x 288 x 742	488 x 288 x 742	aluminium	104
2305	Genius Storage Box 2 Premium (incl. basket closed, 6 packing cushion fabric large, 60 Packing cushions fabric small)	595 x 390 x 810	488 x 288 x 742	488 x 288 x 742	aluminium	104

## Genius test bench container

In addition to and as completion of its value chain, Genius expands its range of products into the area of test bench containers for Lithium-Ion cells and batteries. As such, many years of experience with real fire tests with small to very large Lithium-Ion-batteries in the electromobility sector played a decisive role. The customized test bench containers are used to examine and determine the performance limits of the latest Lithium-Ion-batteries from the electronic

and automotive industry. All containers are made of steel. Of course there are individual ports for cable bushings. The box is easy to move. Battery tests that are safe from a fire protection perspective are optimally guaranteed by the convenient packing cushions and pressure relief valves, which are filled with PyroBubbles®. Thus, resources are used efficiently and economically.

Article no.	Test bench container	Outside dimensions (mm)	Inside dimensions (mm)	Max. size battery (mm)	Material	Volumen (l)
2502	Genius Test Bench 800	1199 x 799 x 1252	1076 x 676 x 1100	1076 x 676 x 1100	stainless steel	800
2505	Genius Test Bench 2100	2100 x 1100 x 120	1800x 800 x 560	1800x 800 x 560	galvanized steel	2100
2503	Genius Test Bench 4200	2835 x 2135 x 1242	2640 x 2000 x 800	2240 x 1600 x 400	painted steel	4224
2501	Genius Test Bench 4500	2835 x 2135 x 1242	2159-2699 x 1460 -2000 x 855	2299 x 1600 x 455	galvanized steel	4491
2504	Genius Test Bench 4900	2935 x 2135 x 1287	2258-2800 x 1458 -2000 x 900	2400 x 1600 x 500	galvanized steel	4900



Genius Test bench container 4200 Trolley



Genius Test bench container 4200 open





Genius Storage Box 280



PyroBubbles®



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Then we are looking forward to your message.