

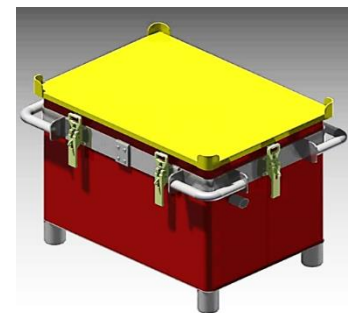
PyroBubbles® – LIONGUARD – Packing Group I

Solutions for collection, storage and transport of lithium-ion batteries

The security system *PyroBubbles*®-LIONGUARD is designed for safe handling of lithium-ion batteries. It consists of a special container of the packing group I and the fire-protection agent *PyroBubbles*®. The components are carefully matched. Even the resulting heat from a thermal runaway does not endanger the surroundings of the container. Thus these containers are suitable to transport batteries which might react dangerously regarding to the SP 376 ADR. In this case the transportation has to be carried under conditions specified by the competent authority.

	Outside L x B x H (mm)	Inside L x B x H (mm)	Volume (l)	Net weight (kg)	max. dan- gerous goods (kg)	max. gross weight (kg)
S-Box X1	799 x 599 x 734	676 x 476 x 580	187	50	66	160
S-Box X2	799 x 599 x 1114	676 x 476 x 960	309	75	110	240
M-Box X1	1199 x 799 x 792	1076 x 676 x 640	466	80	155	350
M-Box X2	1199 x 799 x 1252	1076 x 676 x 1100	800	129	360	630
XXL-Box	2500 x 1484 x 1029	2376 x 1356 x 780	2513	437	400	1212

- Clamps, circumferential rubber gaskets, pressure relief valves
- Made of stainless steel
- Easy handling by means of pallet truck, forklift or crane
- Filling opening = container cross-section
- Standard sizes for simple logistics
- Approved transport container for lithium-ion batteries up to 400 kg (which is the maximum in the ADR)



S-Box X1



M-Box X2



Quick Clamps

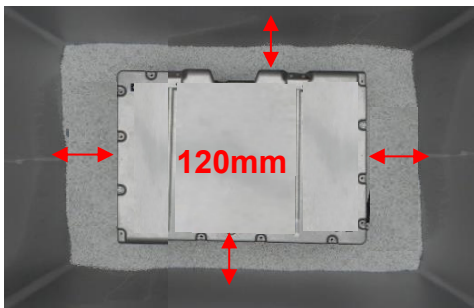


S-Box X1

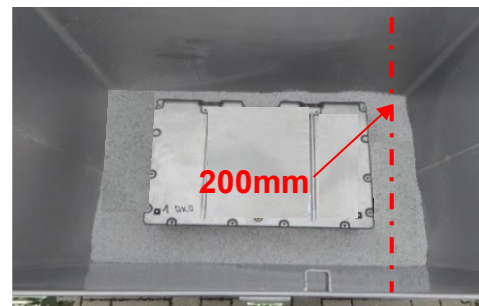
Current exemplary guidelines of the BAM for batteries up to 340 kg include following instructions:

The filling layers have to be to the sides at least 120 mm *PyroBubbles®* and to the base plate and top cover at least 200 mm *PyroBubbles®*. Temperatures of the exterior walls remain well below 100 °C, even during and after a thermal runaway.

	max. battery size L x B x H (mm)	max. Volume of the battery (l)
S-Box X1	436 x 236 x 180	19
S-Box X2	436 x 236 x 560	58
M-Box X1	836 x 436 x 240	87
M-Box X2	836 x 436 x 700	255
XXL-Box	2136 x 1116 x 380	906



120 mm *PyroBubbles®* to the sides



200 mm *PyroBubbles®* to the top and bottom

PyroBubbles®

The product *PyroBubbles®* is an extinguishing agent tested positively by MPA Dresden according to DIN EN 3-7 for solid and liquid combustible substances (fire class A, B, D and F). The expanded glass granulate is assigned to the material class A1 (DIN 4102). The product is very light and is ideal as inert filler. The main component of the product *PyroBubbles®* is silicon dioxide. The particle size is from 0.5 to 5 mm. *PyroBubbles®* are temperature resistant up to about 1050 °C. Even after extinguishing a fire, the extinguishing granules can be simply vacuumed and the main part can be re-used.



PyroBubbles® granule cut through



PyroBubbles® on water



PyroBubbles® bulk material