

SORTING AND PACKAGING INSTRUCTIONS

for lithium rechargeable and lithium primary batteries



Lithium batteries are used in numerous devices and come in all shapes and sizes. Therefore, it may not be an easy task to recognize and sort the various kinds of batteries accordingly. The following is intended as a guideline for sorting, packaging and transportation including the mandatory regulations for the above.

We would appreciate it if you kept off non-conforming material, namely:

- radioactive products
- other batteries than lithium primary and lithium secondary specifically, mercury, cadmium and lead batteries
- other material of any kind
- contaminated cushioning materials
- contaminated drums
- defective, mechanically damaged or leaking lithium batteries

We reserve the right to charge additional costs resulting from additional sorting **due to non-conforming materials mentioned above**, packaging, disposal and logistics cost.

Offers have been calculated on the basis of 0.00% Hg, Cd, Pb and at least 98% of general category Lithium-Primary (Li-P) or Lithium-Secondary (Li-Ion). Each of those categories may be delivered as a mix of subchemistry (Li-P: TCl, MnOx, etc. / Li-Ion: NMC/LCO/LFP, etc.). In case a customer would like to sort these categories according to our price list, we will provide further sorting criteria below.

Any other batteries, packs or modules can be recycled and commercially categorized on request.

CATEGORIES OF END-OF-LIFE RECHARGEABLE LI-ION BATTERIES

1 Consumer battery (regular)

means any rechargeable Li-Ion battery, battery pack or accumulator EOL (end of life – no virgin goods) that

- (a) is sealed; and
- (b) can be hand-carried; and
- (c) is used by consumers or professionals in electronics and household applications; and
- (d) is not used in cordless power tools; and
- (e) is neither an industrial battery nor accumulator nor an automotive battery or accumulator;
- (f) has a protective casing

e.g.
mobile phone
laptop



2 Power tools

means any rechargeable battery, battery pack or accumulator that

- (a) is sealed; and
- (b) can be hand-carried; and
- (c) comes from a hand-held appliance intended for maintenance, construction or gardening activities.
- (d) does not weigh more than 2 kg

e.g.
cordless drill
vacuum cleaner
gardening tools



3 E-bike / individual mobility

means any rechargeable battery, battery pack or accumulator that

- (a) comes from a bicycle with an integrated electric motor which can be used for propulsion to assist the rider's pedal-power
- (b) has a protective casing

e.g.
e-bike
pedelec
monodrive
hoverboard
electric scooter



4 Automotive Mobility



5 Others

means any other type rechargeable battery, battery pack or accumulator that

- (a) does not meet categories above
- (b) is a single battery or battery cluster with connectors
- (c) pouch or polymer cells or modules

e.g.
any other application



CATEGORIES OF LI-PRIMARY BATTERIES

6 Consumer Li-battery

means any non-rechargeable Li-P single cell or battery pack that

- (a) has a maximum diagonal length of 25 cm; and
- (b) is used by consumers, professionals or the military in electronics; and
- (c) has either a manganese dioxide (MnO_2 , 3 V), sulfur dioxide (SO_2 , 3.6 V) or lithium iron disulfide (LiFeS_2 , 1.5 V) battery chemistry

e.g.

PCB storage
older models of digital cameras



7 Thionyl chloride

means any non-rechargeable Li-P single cell or battery pack that

- (a) has a maximum diagonal length of 25 cm; and
- (b) is used for long-term applications and those with a low consumption of electricity; and
- (c) has a lithium thionyl chloride chemistry (LiSOCl_2) and 3.6 V

e.g.

meter
smoke detector



8 Packs and rods for disassembly

usually means any non-rechargeable Li-P battery pack or rod that

- (a) is assembled from single cells; and
- (b) cannot be easily dismantled; and
- (c) has a minimum diagonal length of 25 cm

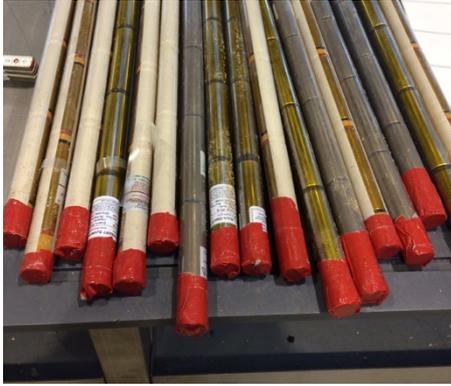
e.g.

oil drilling

drill rod

military applications

in-pipe inspection robot



CATEGORIES OF NiCd BATTERIES

9 Single cells

e.g.

means any non-rechargeable Li-P single cell or battery pack that

- (a) has a maximum diagonal length of 25 cm; and
- (b) is used by consumers, professionals or the military in electronics; and
- (c) has either a manganese dioxide (MnO_2 , 3 V), sulfur dioxide (SO_2 , 3.6 V) or lithium iron disulfide (LiFeS_2 , 1.5 V) battery chemistry

PCB storage
older models of digital
cameras



10 Packs

e.g.

means any non-rechargeable Li-P single cell or battery pack that

- (a) has a maximum diagonal length of 25 cm; and
- (b) is used for long-term applications and those with a low consumption of electricity; and
- (c) has a lithium thionyl chloride chemistry (LiSOCl_2) and 3.6 V

meter
smoke detector



II Industrial < 1kg/cell

usually means any non-rechargeable Li-P battery pack or rod that

- (a) is assembled from single cells; and
- (b) cannot be easily dismantled; and
- (c) has a minimum diagonal length of 25 cm

e.g.

- oil drilling
- drill rod
- military applications
- in-pipe inspection robot



ADDITIONAL SAFETY INSTRUCTIONS

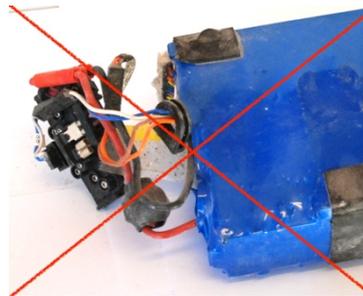
General instructions to avoid short circuit

See also general packaging rules and regulations on page 7.

loose cables

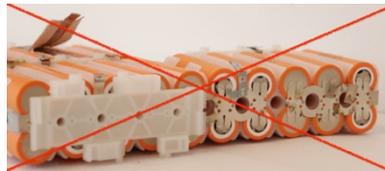
Make sure that cables do not have any metallic, bare parts or ports and cannot be damaged during transportation.

blank cables



Cables with open ports or bare parts have to be cut so that no bare stranded wires are visible. Cut the wire as close as possible to the battery.

exposed electrical contacts and ports



Exposed ports and contacts are to be taped.

moisture

Keep batteries and isolation material away from water and strong moisture, especially batteries above 10 V. Batteries in liquids can generate micro current and heat up the battery slowly up to TR (thermal self-destruction).

Transportation regulations

The sender is responsible for the packaging according to the dangerous goods regulations and legislation (ADR and IMDG). The material is to be prepared according to the batteries' condition and composition.

If a shipment contains less than 333 kg lithium batteries, it may be transported as non-dangerous goods without the dangerous goods label according to SP 636. In all other cases batteries shall be transported under ADR SP 377 as dangerous goods and shall be packed according to packaging instruction P909.

Use only UN-approved drums. These may be recognized by the embossing containing an x or y in the UN approval code. The maximum service life of plastic drums is five years (date of manufacture is stamped). Metal drums must contain a plastic liner. After the drums have been filled, the batteries should be covered with a 10 cm layer of sand or vermiculite.

Packaging rules

Additionally, lithium batteries are to be protected against short circuits. This may be done by:

Taping

Tape the poles or cables. Avoid cluster of batteries taped together.



Bagging

Bag each battery separately in a plastic bag.



Insulation with inert, non-conductive material

Alternatively, batteries can be isolated with dry sand or dry vermiculite. Alternate batteries and layer of insulation material (sand or vermiculite. Batteries must not touch each other. Last layer is one of 10 cm sand or vermiculite. The more the safer.



Sand

Use dry sand for all other lithium-primary batteries (Li-Ion).

Vermiculite

You may use vermiculites for regular consumer packs, power tools, and e-bike batteries, which are not damaged or leaking (Li-Ion).

As well as for packs without cables and button cells (Li-P).

Nonetheless, we recommend the use of sand for safety reasons.

Damaged cells

Packaging for leaking or damaged cells will be provided on request depending on and according to regulations and technical advice.



Transport preparation

UN-drums are to be secured on pallets to prevent movement during transport. Make sure that the drums do not stick out and that the carrier has rubber mates or other means to prevent additional movement on the truck. Fix pallets on truck with tie down straps as well.



Transportation regulations

Each drum is to be labelled with the appropriate dangerous good label:
UN3090 – Lithium-metal batteries
UN3480 – Lithium-Ion batteries

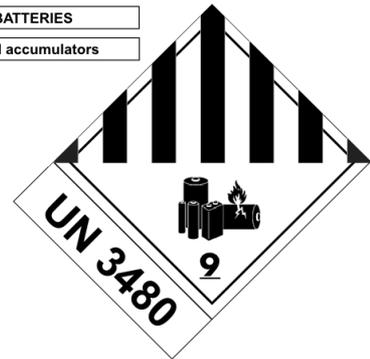
In case of overpacking do not forget the label **OVERPACK**.
When using transparent stretch wrap only **OVERPACK**, by nontransparent wrap also UN labelling.

LITHIUM BATTERIES FOR RECYCLING

UN 3480 WASTE LITHIUM-ION-BATTERIES
EWC 160605 other batteries und accumulators



OVERPACK



Download at www.accurec.de

The correct name in the transportation documents:
UN 3090 WASTE LITHIUM-METAL-BATTERIES, 9, (E)
UN 3480 WASTE LITHIUM-ION-BATTERIES, 9, (E)