

**TRANSPORT
OF RECHARGEABLE
(i.e. from secondary cells / batteries)
LITHIUM IONS
BATTERIES* (BATTERY PACKS) CELLS* (ACCUMULATOR
CELLS)
CONTAINED IN EQUIPMENT**

UN3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

Dangerous goods class 9

Note: UN38.3 SUMMARY SUMMARY SINCE 01.01.2020 OBLIGATIONAL
(An example of the test summary can be found on the last page)

Road transport **ADR**
Rail transport **RID**
Sea transport **IMDG**
Air transport **IATA-ICAO**



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* Please note the explanation of terms on page 8!

TRANSPORT BY ROAD ADR / RAIL RID

- 1) Battery packs (secondary batteries) up to 100 Wh / cells (secondary cells) up to 20 Wh
(Wh = Watt hours) contained in equipment

IF ONLY BUTTON CELLS ARE INSTALLED IN AN EQUIPMENT OR IF NO MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR NO MORE THAN 4 CELLS ARE INSTALLED IN AN EQUIPMENT AND THE SHIPMENT DOES NOT CONTAIN MORE THAN 2 PACKAGES, **NO MARKING AND NO DOCUMENT (NO UNTESTED PACKAGING) IS REQUIRED! see SV188**

IF MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR MORE THAN 4 CELLS ARE INSTALLED IN AN EQUIPMENT:

packaging:

Inner and outer packaging according to SP 188 (SP = special provision)*

No max. gross mass per package

No UN-approved packaging required

labelling:



Sticker: "Lithium batteries" shown in a reduced size,
Black on white, red border with diagonal lines

Minimum width of red hatching 5mm.

If the package allows/allows it, the dimensions,
line width may be reduced to up to 105mm in width and 74mm in height.

* UN 3481

** phone number for additional information

documents:

No transport document required

SP: 188 (special provision 188 ADR/RID)

Cells and batteries installed in equipment must be protected against damage and short circuits. Where batteries are incorporated into equipment, the equipment must be packed in strong outer packaging unless the battery is itself adequately protected by the equipment in which it is incorporated.

Please note that the cells or batteries must be already tested according to UN38.3, i.e. no prototypes may be transported under this SV.

2) Battery packs (secondary batteries) over 100 Wh / cells (secondary cells) over 20 Wh (Wh = Watt hours) contained in equipment:

packaging:

Packaging according to VA 903 (VA = packaging instructions)

drums and boxes of packaging group II

Protection against unintentional activation, protection against short circuit

> than 12 kg: Resistant outer packaging, protective enclosures or pallets.

In the case of outer packaging, the markings must be reproduced, as well as the appropriate UN number with a minimum height of 12mm.

labelling:



Dimensions:

min. 100x100mm,

inner line **at about** 5mm from the outer edge

Hazard label class 9 pattern 9A

shown in smaller size, black on white

UN 3481 must be clearly marked on the outside of the carton and be at least 12mm high.

documents:

The goods must be accompanied by a transport document which must contain the following information:

UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT, 9, (E)

Transport of exempted quantities according to ADR 1.1.3.6

Transport category 2:

According to this regulation of the ADR, Li-ion battery packs (secondary batteries) or cells (secondary cells) can be transported up to a maximum net weight of 333 kg as Excepted Quantity.

This has the advantage that the vehicle does not have to be marked as a transport of dangerous goods (full transport) and the driver does not have to have an ADR certificate. As long as the dangerous goods loaded do not exceed 1000 points!

Sum of dangerous goods points = net weight x 3

TRANSPORT BY SEA FREIGHT IMDG

- 3) Battery packs (secondary batteries) up to 100 Wh / cells (secondary cells) up to 20 Wh
(Wh = Watt hours) contained in equipment

IF ONLY BUTTON CELLS ARE INSTALLED IN AN EQUIPMENT OR IF NO MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR NO MORE THAN 4 CELLS ARE INSTALLED IN AN EQUIPMENT AND THE SHIPMENT DOES NOT CONTAIN MORE THAN 2 PACKAGES, **NO MARKING AND NO DOCUMENT (NO UNTESTED PACKAGING) IS REQUIRED! see SV188**

IF MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR MORE THAN 4 CELLS OR MORE THAN 2 PACKAGES ARE INSTALLED IN AN EQUIPMENT:

packaging:

Inner and outer packaging according to SP 188 (SV = special provision)*

No max. gross mass per package

No UN-approved packaging required

labelling:



Sticker: "Lithium batteries" shown in a reduced size,
Black on white, red border with diagonal lines

Minimum width of red hatching 5mm.

If the package allows/allows it, the dimensions,
line width may be reduced to up to 105mm in width and 74mm in height.

* UN 3481

** phone number for additional information

documents:

No transport document required

SP: 188 (special provision 188 IMDG)

Cells and batteries installed in equipment must be protected against damage and short circuits. Where batteries are incorporated into equipment, the equipment must be packed in strong outer packaging unless the battery is itself adequately protected by the equipment in which it is incorporated.

Please note that the cells or batteries must be already tested according to UN38.3, i.e. no prototypes may be transported under this SV.

4) Battery packs (secondary batteries) over 100 Wh / cells (secondary cells) over 20 Wh (Wh = Watt hours) contained in equipment:

packaging:

Packaging according to VA 903 (VA = packaging instructions)
 drums and boxes of packaging group II
 Protection against unintentional activation, protection against short circuit
 > than 12 kg: Resistant outer packaging, protective enclosures or pallets.

In the case of outer packaging, the markings must be reproduced, as well as the appropriate UN number with a minimum height of 12mm.

labelling:



Dimensions:
 min. 100x100mm,
 inner line **at about** 5mm from the outer edge

Hazard label class 9 pattern 9A
 shown in smaller size, black on white

UN 3481 must be clearly marked on the outside of the carton and be at least 12 mm high and bear the marking "Lithium ion batteries contained in equipment"

documents:

The goods must be accompanied by an IMO declaration which must contain the following information:

UN 3481 Lithium ion batteries contained in equipment, 9, F-A, S-I

Example IMO:

UN-Nr. / UN-No. ⚠	Inhalt (richtiger technischer Name) / Proper Shipping Name ⚠ (Correct technical name) ** ⚠	Klasse/Unter-Klasse-nach-IMO-Class ⚠	Verpackungs-gruppe / Packing group ⚠	Markierung der Versandstücke / Falls zutreffend, Identifikations-Nummer / oder amtl. Kennzeichen / Marks & Nos, if applicable, identification or registration number(s) of the Unit ⚠	Anzahl und Verp.-Art / No. and kind of packages ⚠
UN3481 ⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠	Lithium ion batteries contained in equipment ⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠	9 ⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠	⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠	○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠	1 Fibre Board-Box (4G) ⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠
Bruttomenge (Volumen/Masse) / Gross quantity (volume/mass) ⚠ Nettomenge/Volumen/Masse-Net quantity/volume/mass ⚠ Netto-Explosivstoffmasse *** – Net explosive mass *** ⚠		Merkblatt-Nr. für Unfall-Maßnahmen / EmS No. ⚠	Eigenschaften / Properties ⚠ Flammpunkt / Flashpoint ** ⚠ MARINE POLLUTANT *** ⚠ Kontroll- und Notfalltemperatur *** ⚠ Control- and emergency temperature *** ⚠		Güter angeliefert als / Goods delivered as: ⚠ Stückgut/Breakbulk-cargo ⚠ Ladungseinheiten (Unit Loads)-Unitized cargo ⚠ Bulkverpackungen/Bulk-packages ⚠ Art der Einheit (Container, Anhänger, Tank, Fahrzeug usw.) ⚠ Type of and container, trailer, tank, vehicle etc. ⚠
4.5 kg net quantity ⚠ 7.0 kg gross quantity ⚠ ○○○○⚠		F-A ⚠ S-I ⚠ ○○○○⚠	⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ○○○○⚠ ⊠		

TRANSPORT BY AIR FREIGHT - IATA-ICAO DGR

- 5) Battery packs (secondary batteries) up to 100 Wh / cells (secondary cells) up to 20 Wh
(Wh = Watt hours) contained in equipment

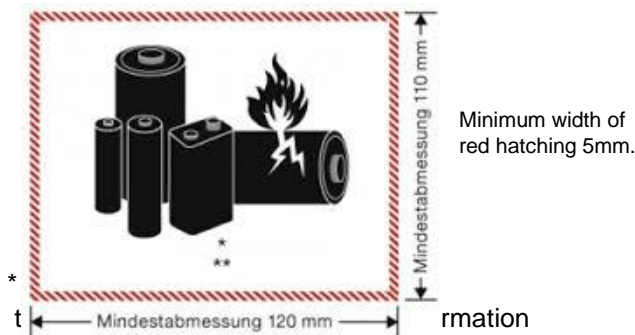
IF ONLY BUTTON CELLS ARE INSTALLED IN AN EQUIPMENT OR IF NO MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR NO MORE THAN 4 CELLS ARE INSTALLED IN AN EQUIPMENT AND THE SHIPMENT DOES NOT CONTAIN MORE THAN 2 PACKAGES, **NO MARKING AND NO DOCUMENT (NO UNTESTED PACKAGING) IS REQUIRED!**

IF MORE THAN 2 BATTERIES (=ACCUMULATOR PACKS) OR MORE THAN 4 CELLS OR MORE THAN 2 PACKAGES ARE INSTALLED IN AN EQUIPMENT:

- 1) packaging:

According to IATA DGR packaging instruction VA:967, part II

labelling:

**PASSENGER AIRCRAFT**

MAX NET QUANTITY PER PACKAGE: 5 KG

CARGO PLANE

MAX NET QUANTITY PER PACKAGE: 5 KG

documents:

the air waybill must contain, among other things, the phrase (only if plates are attached)

"Lithium ion batteries in compliance with Section II of PI967" und fallweise "CAO"

must be noted.

DGD (Dangerous Goods Declaration) is not required.

6) Battery packs (secondary batteries) over 100 Wh / cells (secondary cells) over 20 Wh (Wh = Watt hours) contained in equipment:

packaging:

According to IATA DGR packing instruction VA:967, part I (Note: SV A48)

labelling:



Dimensions:
min.
100x100mm,
inner line **at about** 5mm
from the outer
edge

Dimensions:
min. 120 x 110mm

CASE OF



PASSENGER AIRCRAFT MAX NET QUANTITY PER PACKAGE: 5K CARGO AIRCRAFT MAX NET QUANTITY PER ITEM: 35KG

Sender and recipient

UN 3481 min. 12mm + "LITHIUM-ION BATTERIES CONTAINED IN EQUIPMENT

Net weight, if applicable

be clearly marked on the package

documents:

the air waybill must include the sentence

"Dangerous Goods as per attached Shippers Declaration" if cargo aircraft "CAO" must be noted.

A DGD (Dangerous Goods Declaration) with the following information on the dangerous goods is also mandatory

UN3481, Lithium ion batteries contained in equipment, 9, 967

Example DGD:

Airport of Destination: JOHN.F. KENNEDY				Shipment type: <i>(delete non-applicable)</i>		
<input type="checkbox"/> NON-RADIOACTIVE				<input checked="" type="checkbox"/> RADIOACTIVE		
NATURE AND QUANTITY OF DANGEROUS GOODS						
Dangerous Goods Identification						
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Packing Group	Quantity and type of packing	Packing Inst.	Authorization
UN3481	Lithium ion batteries contained in equipment	9		4 fibreboard boxes x 6 kg	967	

DEFINITION OF TERMS

The law on hazardous goods distinguishes between

LITHIUM BATTERY (secondary battery = battery pack):

"Battery" means two or more cells which are electrically connected and equipped with devices necessary for its use, e.g: battery casing, battery terminals, marking and protection devices. The battery shall be tested according to the requirements of sub-section 38.3 of the UN Manual of Tests and Criteria.



LITHIUM cells (secondary cell):

A lithium single cell battery is considered a "cell" and must be tested in accordance with the test requirements for a "cell" for the purposes of these Regulations and the requirements of subsection 38.3 of the UN Manual of Tests and Criteria.



EQUIPMENT MEANS: the device or equipment which is powered by the lithium cells or batteries during operation.

Secondary means: Rechargeable

GENERAL INFORMATION:

Since many carriers and forwarding agents have their own requirements for the transport of dangerous goods or do not accept dangerous goods, it is recommended to give the following details when placing the transport order:

LITHIUM-ION BATTERIES CONTAINED IN EQUIPMENT / watt-hours
UN3481 / Class 9
Number and weight of packages

As well as the Material Safety Data Sheet (MSDS) or the Safety Data Sheet (SDS).

In the case of outer packaging, the labels or marks and the UN number (min. 12mm in size) must be reproduced on the packaging and the word: OVERPACK / UMVERPACK in at least 12mm character height.

UN38.3 TEST (test summary mandatory since 01.01.2020)

Basically all lithium cells and battery packs must be tested according to UN Manual 38.3 UN. In the course of this UN-test you will also receive the MSDS (Material Safety Datasheet), which basically checks all carriers in advance whether they accept these goods for transport. The transport of prototypes and pre-series is in principle also possible without UN38.3 testing under special conditions but is not dealt with in this guide.

An example of the test summary, which has been mandatory since 01.01.2020, can be found on the last page.

COMMENTS:

Instruction of the involved employees/participants according to their tasks and responsibilities. (e.g.: Consignor - Instruction on his duties or training)

Transport documents / IMO declaration / DGD / may only be issued by instructed persons who have successfully completed the corresponding training.



Important notes:

This information has been prepared and compiled according to the latest state of the art, with care and consideration. All information has been given to the best of our knowledge and belief. Nevertheless, no liability can be assumed for this, as this information can be updated or changed at any time.

The representations make no claim to completeness. With this edition all older editions lose their validity; typographical and printing errors excepted.

Applicable laws and regulations must be observed by the distributors and users of the product on their own responsibility.

Example test summary for UN3480 LITHIUM ION BATTERY







UN38.3 Test Summary

AccuPower – Research, Development and Distribution Company (Ltd.)

UN38.3 TEST SUMMARY

IN ACCORDANCE WITH SUB-SECTION 38.3.5 OF UN MANUAL OF TESTS AND CRITERIA

Model: APAVL7S10P																											
Type: Lithium-Ion battery 7S10P ICR18650 25.9V / 751Wh / 29Ah																											
1	Manufacturer AccuPower Forschungs-, Entwicklungs- und Vertriebsgesellschaft mbH Pirchäckerstraße 27, 8053 Graz, AUSTRIA Tel.: +43 (316) 26 29 11-0 Mail: info@accupower.at Web: www.accupower.at																										
2	UN38.3 Test lab PONY HQ Building Add: Bldg1, Court 66, Jindai Road, Zhongguancun Environmental Protection Park, Haidian District, Beijing, CHINA / Tel.: +86-10-83055000/82618116 Email: pony@ponytest.com Web: www.ponytest.com																										
3	Test report number: MZIPBAQA88798721																										
4	Date of test report: 09-10-2015																										
5	Description of cell or battery Lithium-Ion battery 7S10P ICR18650 25.9V / 751Wh / 29Ah in shrinking tube with cable, interface and connector, LxBxH: 230 x 120 x 80mm +/- 1mm / 3.660kg +/- 0,050kg, AccuPower Product Model: APAVL7S10P																										
																											
UN38.3 Tests performed and successfully passed																											
6	<table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th>Performed test</th> <th>Result</th> </tr> </thead> <tbody> <tr><td>38.3.4.1 / T1</td><td>Altitude Simulation</td><td>Passed</td></tr> <tr><td>38.3.4.2 / T2</td><td>Thermal Test</td><td>Passed</td></tr> <tr><td>38.3.4.3 / T3</td><td>Vibration</td><td>Passed</td></tr> <tr><td>38.3.4.4 / T4</td><td>Shock</td><td>Passed</td></tr> <tr><td>38.3.4.5 / T5</td><td>External Short Circuit</td><td>Passed</td></tr> <tr><td>38.3.4.6 / T6</td><td>Impact / Crush</td><td>Passed</td></tr> <tr><td>38.3.4.7 / T7</td><td>Overcharge</td><td>Passed</td></tr> <tr><td>38.3.4.8 / T8</td><td>Forced Discharge</td><td>Passed</td></tr> </tbody> </table> <div style="display: inline-block; text-align: center;">  <div style="margin-left: 10px;"> <p>Transportation Safety Test passed for:</p> <input checked="" type="checkbox"/> Cargo Aircraft only <input checked="" type="checkbox"/> Sea  <input checked="" type="checkbox"/> Road   </div> </div>	Performed test	Result	38.3.4.1 / T1	Altitude Simulation	Passed	38.3.4.2 / T2	Thermal Test	Passed	38.3.4.3 / T3	Vibration	Passed	38.3.4.4 / T4	Shock	Passed	38.3.4.5 / T5	External Short Circuit	Passed	38.3.4.6 / T6	Impact / Crush	Passed	38.3.4.7 / T7	Overcharge	Passed	38.3.4.8 / T8	Forced Discharge	Passed
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38.3.4.8 / T8	Forced Discharge	Passed																									
7	Edition of UN Manual of used test and criteria: Rev.5 Amend. 1 & 2																										
8	Assembled Battery Testing Requirements: not applicable																										
9	Name and title of signatory/ company stamp  ACCUPOWER Forschungs-, Entwicklungs- und Vertriebsgesellschaft mbH. Pirchäckerstraße 27, A-8053 Graz, AUSTRIA Tel: +43 (0)316 - 262911 10 - Fax: 262911 36 info@accupower.at, www.accupower.at  Ing. Issam Al-Abassy / Application Engineering Manager																										