

Informasjon til deg som skal ut og fly med S19V

Skal du ut og fly med din S19V? Da anbefaler vi deg at du leser dette før du bestiller billett. Her beskriver vi regelverket og våre erfaringer med det å ta med seg S19V på fly.



1. Generelt

De aller fleste flyselskapene retter seg etter de internasjonale IATA reglene som sier noe om hvordan og hvor store rullestoler/batteri det er lov å ta med seg på fly. Det er allikevel opptil hvert enkelt flyselskap å tolke/bruke regelverket slik de ønsker selv og til slutt er det opp til piloten å bestemme om hen vil ha med seg dette produktet på flyet sitt. Derfor er det viktig å undersøke med flyselskapet hvilke regler de har. De tekniske spesifikasjonene finner du i bruksanvisningen.

2. Hvordan går du frem

Når du skal bestille din fly reise så er det viktig at du opplyser om at du skal ha med deg en elektrisk rullestol. Da kommer du til å få mange oppfølgingsspørsmål fra flyselskapet som du må svare på. Vær forberedt og ha bruksanvisningen klar. Du får blant annet spørsmål om vekt, størrelse på produktet, hvilken type batteri, hvor stort batteri osv.

Når du kommer på flyplassen skal du henvende deg til innsjekkingsranken som vanlig for å sjekke inn bagasje. De vil kontakte flyplass assistanse hvis du trenger det. Så får du beskjed om å henvende deg i spesialbagasje for å sjekke inn din S19V. Hepro anbefaler at du har med en reisekoffert til S19V for å beskytte produktet.

3. IATA reglene

- For at en elektrisk rullestol skal være tillatt å ta med på fly, må produktets batteri være godkjent for flytransport. Det vil si at de skal tilfredsstillere kravene som er beskrevet i «UN Manual and Test and Criteria Part III, subsection 38.3». Alle batterier som er levert til Hepro S19V har bestått denne testen.
- Det finnes begrensninger på batterier, men ifølge IATA DGR Edition 64 står følgende beskrevet i punkt 2.3.2.4

Wheelchairs / Mobility Aids with Lithium Batteries

Lithium batteries that are used to power mobility aids must be of a type which meets the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3. The lithium battery(ies) can either remain installed in the mobility aid, if the battery(ies) is protected against damage by the design of the mobility aid and securely attached to the mobility aid or be removed, following the manufacturer's instructions. The removed battery(ies) must not exceed 300 Wh.

Where the battery(ies) is not removed, there is no limit to the Watt-hour (Wh) rating for the installed battery(ies).

Så lar man batteriet stå fastlåst i rullestolen så finnes det ingen begrensning på batteriets kapasitet

Batteriet på S19V har 25V, 23,45Ah li-Ion (586Wh)

Noen flyselskaper krever at batteriene er helt frakoblet rullestolens elektriske anlegg under transport. Dette gjøres enklest ved å ta bort sikringen på batteriboksen.

Flyselskapene har rett til å tolke reglene på sin måte, og til og med ha egne regler for hvordan dem håndterer disse retningslinjene. Derfor er det viktig at man kontakter flyselskapet for å undersøke dette i god tid før du skal på reise.



LITHIUM ION BATTERY SAFETY TESTING REPORT

Applicant:	Mobile Energy Technology Co., Ltd. No. 13, Kong 9th Rd., 2nd Industrial Park, Linkou Dist., New Taipei City 244, Taiwan (R.O.C.) Tel: 02-2601-0385 ; E-mail: davis@metco.com.tw Website:www.metco.com.tw/
Manufacturer:	Mobile Energy Technology Co., Ltd. No. 13, Kong 9th Rd., 2nd Industrial Park, Linkou Dist., New Taipei City 244, Taiwan (R.O.C.)
Product:	Rechargeable Li-ion Battery Pack
Model:	HT-16A
Rating:	25.2 V, 10.05 Ah, 253.26 Wh
Test method & Criterion	UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7
Appearance	Black Plastics cement shell
Verification Issuing Office Name	AnTek Certification Inc. No. 21,Gongjian Rd. Keelung, 20647 Taiwan Tel: +886-2-2452-2256; Website: www.atclab.com.tw; E-mail: atc@atclab.com.tw
Date Received	Feb. 17, 2022
Test Performed Date:	Feb. 17, 2022– Apr. 22, 2022
Conclusion:	The sample has passed the test items of UN 38.3
Date of Issued:	Apr. 28, 2022
Comment:	Internal cell source: Panasonic / NCR18650GA

Prepared by:

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Hank Chen
Project handler

Approved by:

Nick Wu

Nick Wu
Technical reviewer

Lithium Ion Battery UN38.3 Test Report

Applicant:	STL Technology Co., Ltd. No. 1, West 15th St., Cianjhen Dist., Kaohsiung City 806011, Taiwan Tel: +886-7-841-1501 ; E-mail: stl@stl-tech.com Website: http://www.stl-tech.com/
Manufacturer:	STL Technology Co., Ltd. No. 1, West 15th St., Cianjhen Dist., Kaohsiung City 806011, Taiwan
Product:	Rechargeable Li-ion Battery Pack
Model:	77172668
Rating:	25.2V / 23.45Ah / 590.9Wh
Test method & Criterion	UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7
Appearance	Black plastics shell
Verification Issuing office Name	STL Laboratory No. 1, West 15th St., Cianjhen Dist., Kaohsiung City 806011, Taiwan Tel: +886-7-841-1501 ; E-mail: stl@stl-tech.com
Date Received	20220623
Test performed Date:	20220627 ~ 20220805
Conclusion:	The sample has passed the test items of UN 38.3
Data of issued	20220815
Comment:	

Prepared by:

Checked by

黃靖月

蘇泓彰

Prepared by:

Approved by

蔡昌達

張文星



(Lithium Battery UN38.3 Test Report)

Lithium Battery UN38.3

Test Report

1 : SAMPLE DESCRIPTION

Sample Name : Battery Pack
 Model Name : EBP28A076C1
 Nominal Voltage : 25.2V
 Rated Capacity : 11.5Ah
 Charge Voltage : 29.4V
 Maximum Charge Current : <6A
 Maximum Discharge Current : 20A

2 : STANDARD

RECOMMENDATIONS ON TRANSPORT OF DANGEROUS GOODS, MANUAL OF TEST AND CRITERIA, SECTON 38.3 LITHIUM BATTERIES (ST/SG/AC.10/11/Rev 5/ Amend.2 section 38.3)

3 : TEST ITEM

- | | |
|---------------------------|---------------------------------|
| 1. Altitude simulation | 2. Thermal test |
| 3. Vibration | 4. Shock |
| 5. External short circuit | 6. Impact (Cell only) |
| 7. Overcharge | 8. Forced discharge (Cell only) |

4 : CONCLUSION

ITEM	SAMPLE NUMBER	STANDARD	CONCLUSION
Altitude simulation	1~8	UN38.3-T1	Pass
Thermal test		UN38.3-T2	Pass
Vibration		UN38.3-T3	Pass
Shock		UN38.3-T4	Pass
External short circuit		UN38.3-T5	Pass
Impact	----	UN38.3-T6	ND
Overcharge	1~8	UN38.3-T7	Pass
Forced discharge	----	UN38.3-T8	ND

The submitted samples were complied with the stated requirements of ST/SG/AC.10/11/Rev 5/Amend.2 section 38.3.

Compiled by: Chingyuehuang Checked by: Frise Su Approved by: Wenhsing Chang



Battery-Powered Wheelchair and Mobility Aid Guidance Document

Transport of Battery-Powered Wheelchair and Mobility Aid Carried by Passengers

Revised for the 2023 Regulations

Introduction

△ This document is based on the provisions set out in the 2023 – 2024 Edition of the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Technical Instructions) and the 64th Edition of the IATA Dangerous Goods Regulations (DGR).

Information on the DGR can be found here:

<https://www.iata.org/dgr>

The batteries that power wheelchairs and mobility aids are considered dangerous goods when carried by air. These and some other dangerous goods that are permitted for carriage by passengers can be transported safely by air provided certain safety requirements are met. The requirements are detailed in the IATA Dangerous Goods Regulations, which are based on the ICAO Technical Instructions.

Training is an essential element in maintaining a safe regulatory regime. It is mandatory for all individuals involved in the preparation or transport of dangerous goods, including battery powered wheelchairs and mobility aids, to be trained to carry out their responsibilities. Depending on the job-function, this will require familiarisation training or more detailed training on the specific requirements in the Regulations. It is important to remember that dangerous goods are very unlikely to cause a problem when they are prepared and handled in compliance with the IATA Dangerous Goods Regulations.

Passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg) may travel with a battery-powered mobility aid with the operator's approval. Proper pre-notification by the user helps ensure all parties involved in the transport chain to:

- know what device(s) and battery type(s) are being transported;
- understand how to properly load and handle them; and
- follow the relevant emergency response procedure(s) should an incident or accident occur during flight or on the ground.

The pilot-in-command must be informed of the location of the mobility aid with installed batteries, removed batteries and spare batteries, to best deal with any emergencies that they may occur.

Inadvertent operation of battery-powered mobility aids can cause friction or electrical load which could lead to a fire. If the mobility aid is loaded in the aircraft with the battery(ies) installed, the electrical circuits must be isolated by following the manufacturer's instructions. To avoid delays during loading, it is important that these instructions and the additional information detailed in the operator approval section of this guidance document are provided in advance.

The purpose of this document is to provide guidance for complying with the provisions applicable to the transport by air of battery-powered wheelchairs and other mobility aids when carried by passengers as set out in the DGR. Specifically, the document provides information on:

- Definitions;
- Limitations and Classification;
- Operator Approval;
- Training;
- Handling; and
- Frequently Asked Questions.

Definitions

Battery manager. An electronic device incorporated in the battery circuit to protect the battery and/or cells from events such as over-charge, over-discharge, over-current, over-temperature and cell imbalance.

Note:

The battery management function may be integrated into the battery or distributed over the control and drive system.

Disabled person or person with reduced mobility. Any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotor, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or age, and whose situation needs appropriate attention and the adaptation to his or her particular needs of the service made available to all passengers.

Ref. Regulation (EC) No 1107/2006, Article 2

Lithium-ion batteries (sometimes abbreviated Li-ion batteries) are a secondary (rechargeable) battery where the lithium is only present in an ionic form in the electrolyte. Also included within the category of lithium-ion batteries are lithium polymer batteries. Lithium-ion batteries are generally used to power devices such as mobile telephones, laptop computers, tablets, power tools and e-bikes.



Figure 1 – Examples of Lithium Ion Batteries

Note:

The watt-hour (Wh) rating is a measure by which lithium ion batteries are regulated. Lithium ion batteries are required to be marked with the Watt-hour (Wh) rating.

The Watt-hour rating of a lithium ion battery can also be calculated from the battery's nominal voltage (V) and capacity in ampere-hours (Ah):

$$Ah \times V = Wh$$

If only the milliampere-hours (mAh) are marked on the battery, then divide that number by 1000 to get ampere-hours (Ah) (e.g. 4400 mAh / 1000 = 4.4. Ah).

If you are unsure of the Watt-hour rating of your lithium ion battery, refer to the device User Manual or contact the manufacturer.

Non-spillable wet batteries. Have an absorbed electrolyte (absorbed glass mat (AGM), gel battery, gel cell, sealed lead-acid (SLS), dry and dry cell) and do not leak any electrolyte or liquid even if the battery case is ruptured or cracked. The batteries must be capable of passing certain vibration and pressure differential tests.



Figure 2 – Examples of Non-Spillable Wet Batteries

Note:

For the purpose of this guidance document, this definition also includes batteries which comply with IATA DGR Special Provision A123 or A199. Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-cadmium and nickel-metal hydride batteries.

Operator. A person, organisation or enterprise engaged in or offering to engage in an aircraft operation.

△ **Spillable wet batteries.** consist of a series of metal plates immersed in an electrolyte. The electrolyte is a corrosive liquid such as dilute sulphuric acid. Spillable batteries will leak the corrosive electrolyte if not maintained in an upright condition throughout transport, including loading and unloading.



Figure 3 – Example of Spillable Wet Battery

Tour operator. An organiser or retailer of package tours and tourism services for sale either directly to travellers or through intermediaries.



WCBD. Wheelchair (mobility aid) powered by a non-spillable battery, nickel-metal hydride battery or a dry battery.

WCBW. Wheelchair (mobility aid) powered by a wet cell (spillable) battery.

WCLB. Wheelchair (mobility aid) powered by a lithium ion battery.

Wheelchair system. The electrical and electronic traction control system for a wheelchair including the battery, its manager, the motor speed controller, the user interface and all wiring and safety devices.

Limitations and Classification (DGR 2.3.2)

△ All battery-powered wheelchairs or mobility aids must be prepared to prevent unintentional activation during transport and the battery terminals must be protected from short circuits. The battery(ies) can either be securely attached to the device with the electrical circuits being isolated following the manufacturer's instructions or removed following the manufacturer's instructions if the design of the device cannot provide adequate protection to the battery(ies) against damage.

Battery-powered wheelchairs or mobility aids for use by passengers are classified in three main categories based on the battery type that powers the device:

- Wheelchairs / mobility aids with non-spillable wet batteries, nickel-metal hydride batteries or dry batteries (DGR 2.3.2.2);
- Wheelchairs / mobility aids with spillable batteries (DGR 2.3.2.3); and
- Wheelchairs / mobility aids with lithium batteries (DGR 2.3.2.4).

Each category has its unique requirements and they must be strictly followed to ensure safe transport of the device.

Wheelchairs / Mobility Aids with Non-spillable Wet Batteries, Nickel-Metal Hydride Batteries or Dry Batteries

This category consists of mobility aids powered by one of three different types of batteries, non-spillable wet batteries, nickel-metal hydride batteries or dry batteries.

Non-spillable wet batteries must comply with Special Provision A67.

Special Provision A67. Wet cell batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leaking of battery fluid.

Vibration test: The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test: Following the vibration test, the battery is stored for six hours at $24^{\circ}\text{C} \pm 4^{\circ}\text{C}$ while subjected to a pressure differential of at least 88 kPa. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

A passenger may carry a maximum of one spare wet, non-spillable battery meeting Special Provision A67.



Nickel-metal hydride batteries must comply with Special Provision A199.

Special Provision A199. Nickel-metal hydride batteries or nickel-metal hydride battery-powered devices, equipment or vehicles having the potential of a dangerous evolution of heat are not subject to these Regulations (DGR) provided they are prepared for transport so as to prevent:

- (a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and
- (b) unintentional activation.

A passenger may carry a maximum of two spare nickel-metal hydride batteries meeting Special Provision A199.

Dry batteries must comply with Special Provision A123.

Special Provision A123. Examples of such batteries are: alkali-manganese, zinc-carbon and nickel-cadmium batteries. Any electrical battery or battery-powered device, equipment or vehicle having the potential of a dangerous evolution of heat must be prepared for transport so as to prevent:

- (a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and
- (b) unintentional activation.

A passenger may carry a maximum of two spare dry batteries meeting Special Provision A123.

All removed and spare batteries must be carried in strong, rigid packagings and must only be carried in the cargo compartment.

Wheelchairs / Mobility Aids with Spillable Batteries

Mobility aids powered by spillable batteries must always be loaded, stowed, secured and unloaded in an upright position or if the mobility aid does not adequately protect the battery, the battery must be removed. Therefore, it is important to provide the dimensions of the device in advance of travel so that the operator can determine whether the battery needs to be removed. The removed battery must be carried in a strong, rigid packaging and must only be carried in the cargo compartment.

Wheelchairs / Mobility Aids with Lithium Batteries

Lithium batteries that are used to power mobility aids must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.

- △ The lithium battery(ies) can either remain installed in the mobility aid, if the battery(ies) is protected against damage by the design of the mobility aid and securely attached to the mobility aid or be removed, following the manufacturer's instructions. The removed battery(ies) must not exceed 300 Wh.

Where the battery(ies) is not removed, there is no limit to the Watt-hour (Wh) rating for the installed battery(ies).

A passenger may carry a maximum of one spare battery not exceeding 300 Wh or two spare batteries each not exceeding 160 Wh.

All removed and spare batteries must be protected from damage (e.g. by placing each battery in a protective pouch) and must only be carried in the passenger cabin.

Operator Approval

The approval of the operator is required for battery-powered mobility aids used by passengers. At least 48 hours prior to travel or at the time of booking, the user of the mobility aid, travel agent, tour operator or other third-party booking websites should seek approval from the operator for the carriage of the battery-powered mobility aid. The operator is required to have a documented approval process which needs to be published in accessible formats and technologies, such as electronic, web-based, large print and audio, in a timely manner and without additional cost to the passenger. Details should be easily accessible and clearly described on the operator's website and/or made available to call-centre staff.

Web-based material and internet booking should be accessible to persons with disabilities in accordance with international web accessibility standards found at <http://www.w3.org/standards/webdesign/accessibility>.

The minimum information required as part of the approval process includes:

- Does the mobility aid have a battery(ies)?

The presence of a battery(ies) will impact how the mobility aid is transported. Having this information in advance will enable operators to meet international transport regulations.

- Who is the device manufacturer and what is the model number?

In case the user of the mobility device is unable to locate the manufacturer's instructions, providing this information may enable the operator to obtain the information from the manufacturer's website or from other sources.

- What type of battery is used to power the mobility aid?

Providing the battery type is an important piece of information the operator requires to determine how to prepare the device prior to and during loading onto the aircraft. The five battery types are: non-spillable, nickel-metal hydride, dry, spillable and lithium ion.

- for non-spillable, nickel-metal hydride and dry batteries, all removed and spare batteries must be packed in a strong and rigid packaging.
- for spillable batteries, the mobility aid must always be kept upright, or if this is not possible, the battery(ies) must be removed from the mobility aid.
- for lithium ion batteries, the number and Watt-hour rating of installed and spare battery(ies) are required where the design of the mobility aid does not provide adequate protection for the battery and therefore the battery must be removed during transport.

If the passenger is unsure of the battery type, the passenger should be asked if anyone is able to help them determine this in advance of their travel.

- What is the total weight of the mobility aid, including installed batteries and accessories?

This information is required to enable the operator to plan the loading of the device onto the aircraft and help them determine if additional resources are required prior to or during loading and securing within the aircraft.

- What is the length, width and height (including accessories) of the mobility aid as presented for air travel?

The dimensions of the device are required to determine that the aircraft door and cargo compartment can accommodate the mobility aid. Depending on the aircraft type that operates a particular route, including any connecting flights, the mobility aid may be too big to fit in the aircraft. Having the dimensions in advance will provide the operator an opportunity to offer an alternative routing or flights to accommodate passengers travelling with large mobility aids.

- Does the mobility aid have any removable or adjustable parts (such as a custom seat cushion, joystick or headrest)?

In the event the mobility aid as presented for travel cannot fit in the aircraft cargo compartment, are there any removable or adjustable parts that will help to reduce the height/width of the mobility aid? Reducing the size may help operators to safely accommodate the mobility aid. Smaller removable parts should be placed in a suitable container or bag and stowed in the cabin with the passenger.

- △ ▪ Does the battery(ies) need to be removed from the mobility aid for transport

The Dangerous Goods Regulations (DGR) require the battery to be removed for carriage where the design of the mobility aid does not provide adequate protection and that the battery(ies) is not securely attached to the device. This typically applies where the battery is not protected by the design of the mobility aid and the manufacturer of the device intends that the battery must be removed for the device to be folded, or otherwise prepared for transport.

If the battery(ies) must be removed, the passenger should be prepared to provide instructions on how to remove the battery prior to loading.

Note:

If the user is unable to answer this question, the agent/operator should work with the passenger, their representative or the manufacturer of the device to obtain instructions before departure.

- Is the user aware of how to disconnect power from the device?

To prevent accidental activation during flight, the operator is required to verify the power is disconnected and electrical circuits are isolated. The user should provide instructions on how to do this before departure.

Note:

If the user is unable to answer this question, the agent/operator should work with the passenger, their representative or the manufacturer of the device to obtain instructions before departure.

- Is the user aware of how to engage/disengage the freewheel mode for the mobility aid?

Prior to loading the device onto the aircraft, it must be put into freewheel mode. The passenger should be asked for instructions on how to do this before departure.

Note:

If the user is unable to answer this question, the agent/operator should work with the passenger, their representative or the manufacturer of the device to obtain instructions before departure.



Training

Training for all staff in the air travel service delivery is vital for providing quality service to persons with reduced mobility in a consistent and respectful manner. It is essential that staff know their responsibilities and can perform them competently. Training should address the attitudinal, environmental/physical and organisational barriers that affect persons with reduced mobility in air transport. Training is required to prepare staff to aid persons with reduced mobility in a manner that respects their dignity, and as a professional service to which the person is entitled, rather than as a favour or compassionate gesture.

Training is required to include the policies and procedures of the organisation and should be appropriate to the duties of the person being trained and include emergency response procedures.

In addition to general training, aircraft and airport operators must ensure that they train their employees and contractors who are required to handle battery-powered mobility aids. This will include procedures for preparing, securing, carrying and stowing of mobility aids for air transport.

Handling

Acceptance

Prior to acceptance, the operator must verify that:

- the battery terminals are protected from short circuits. This does not necessarily mean removing the battery. An example of protecting the terminals would be to enclose the battery within a battery container; and
- △ ▪ the battery is either:
 - adequately protected against damage by the design of the mobility aid and securely attached to the mobility aid; or
 - removed from the mobility aid following the manufacturer's instructions.

There are specific handling requirements for different types of batteries:

- non-spillable wet batteries, nickel-metal hydride batteries and dry batteries – confirm with the passenger that relevant special provision has been complied with (A67 for non-spillable wet batteries, A199 for nickel-metal hydride batteries and A123 for dry batteries). All removed and spare batteries must be placed in strong, rigid packagings and must only be transported in the cargo compartment.
- spillable batteries – the batteries should be fitted with spill-resistant vent caps, where feasible. They must be removed from the mobility aid if the device cannot be loaded, stowed, secured or unloaded in an upright position. Removed batteries must be carried in strong, rigid packagings as follows:
 - packagings must be leak-tight, impervious to battery fluid and be protected against upset by securing to pallets or by securing them in cargo compartments using appropriate means of securement (other than by bracing with freight or baggage) such as by use of restraining straps, brackets or holders;
 - batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; and
 - these packagings must be marked "BATTERY, WET, WITH WHEELCHAIR" or "BATTERY, WET, WITH MOBILITY AID" and be labelled with the "Corrosive" label (see Figure 1) and with the "Package Orientation" label (see Figure 2).



Figure 1 – Corrosive label

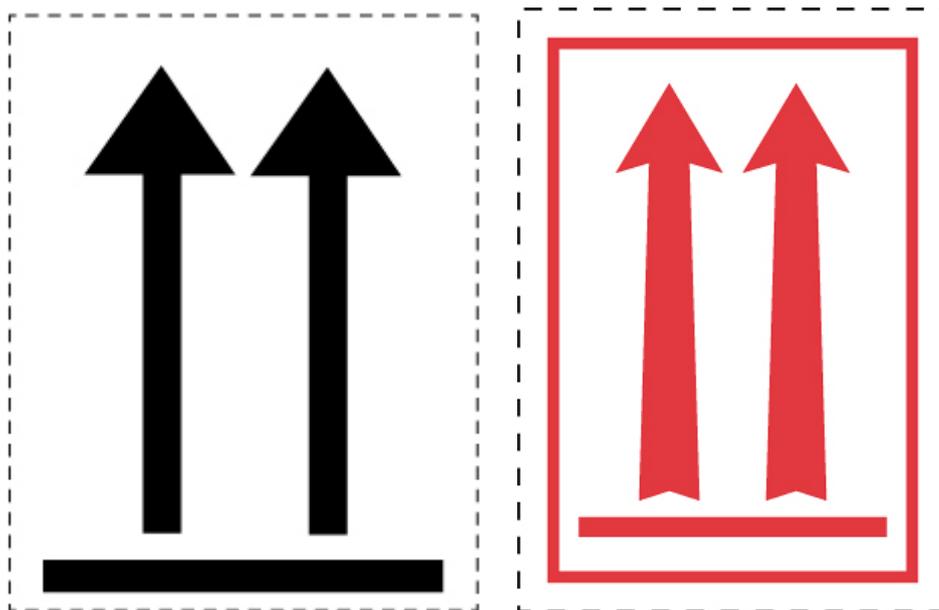


Figure 2 – Package Orientation Label

- lithium ion batteries – confirm with the passenger that the batteries meet the requirements of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3. Where the battery is removed from the mobility aid, it must not exceed 300 Wh, or for mobility aids fitted with two batteries, each battery must not exceed 160 Wh. All removed and spare batteries must be protected from damage and must only be carried in the passenger cabin.

Any exposed terminals including non-shielded cable connectors must be insulated to prevent short-circuit.

Once the mobility aid has been prepared for air transport, to verify that electrical circuits have been isolated, place the device into drive mode (i.e. not freewheel mode), see if the mobility aid will power up and if so whether use of the joystick results in the mobility aid moving. It must also be verified that the circuits of supplemental motorised systems such as seating systems have been isolated to prevent inadvertent operation, e.g. by the

separation of cable connectors. If a battery-powered mobility aid has not been made safe for carriage, it must not be loaded into the aircraft.

To assist the handling of wheelchairs and mobility aids with batteries, a label such as shown in Figure 3 may be used to assist in identifying whether or not a wheelchair has had the battery removed.

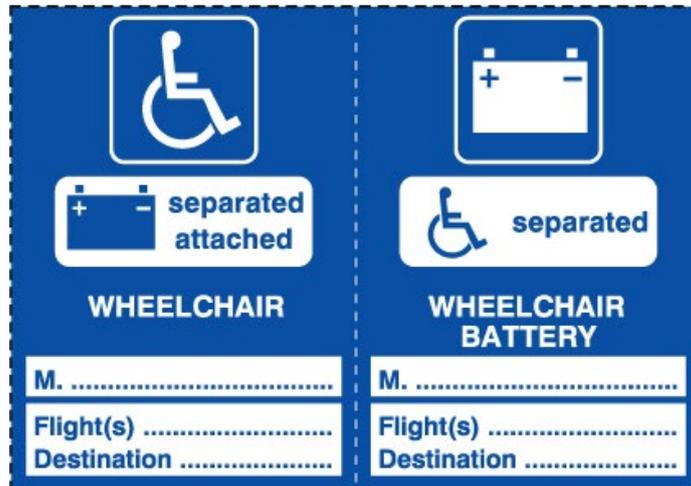


Figure 3 – Battery-powered Wheelchair and Mobility Aid Label

(left part of the label remains with the wheelchair and indicates whether or not the battery has been removed, and right part of the label can be used where the battery is separated from the wheelchair)

Loading

The wheelchair or mobility aid must be secured against movement in the cargo compartment, by use of straps, tie-downs or other restraint devices. The mobility aid, including batteries, electrical cabling and controls must be protected from damage, including damage caused by the movement of baggage, mail and cargo.

Accordingly, any battery-powered mobility aid must not be stowed together with loose loaded (bulk) items within a unit load device (ULD) or netted section of the cargo compartment.

Examples of good practice for securing mobility aids include:

- use tie-down points
- keep the mobility aid in an upright position where possible
- secure the mobility aid using the base frame – **BASE IS BEST**
- secure removable and fragile parts in the cabin
- avoid unnecessary tilting of the mobility aid
- disengage freewheel mode
- disconnect/isolate power
- ensure adequate clearance when loading
- avoid over-tightening tie-down straps or other securing devices
- load last when possible

Examples of bad practice for securing mobility aids include:

- unnecessary tilting
- loading and securing the mobility aid on its side
- placing baggage, mail or cargo on the mobility aid
- failure to disengage freewheel mode



- failure to disconnect power
- using excessive force to load and secure the device
- connecting straps to the cargo compartment divider, curtains or nets
- strapping unstable or fragile components, e.g. armrests, wheels, joystick, tiller
- driving or sitting in the mobility aid

If the battery-powered mobility aid has loose fitting parts, such as armrests, footrests, or cushions, they should be placed in a suitable pouch/container, prior to loading in the cargo compartment, to prevent any loose parts from being lost or damaged. It is recommended that passengers provide their own suitable pouch/container for any removed parts. Many passengers prefer to carry this type of equipment on board the aircraft to prevent loss of damage.

Operators should also consider loading large complex devices always in an upright position. These mobility aids tend to be custom made and may have additional attachments specifically designed and fitted for individual users. These devices are designed and tested for use in an upright position only. Turning these devices on their side is not usually recommended by the manufacturer and will inevitably result in the device being damaged. Loading devices on their side in the cargo compartment or unit load device also creates challenges for securing these devices in the aircraft or ULD, as the straps or other means of securing the device will be across the side of the device, which is potentially the weakest point. Where the cargo compartment of the aircraft is too small to load the mobility aid upright, operators should consider offering alternative routings or flights that can accommodate larger devices rather than taking the risk of damaging the device.

Notification to Pilot-in-Command

The pilot-in-command must be informed of:

- the location of mobility aids with installed batteries;
- the location of removed batteries; and
- the location of spare batteries, either in the cargo compartment, or for lithium batteries in the passenger cabin.



Table 1 – Overview of Mobility Aids Powered by Different Battery Types

Type of Batteries-Powered Mobility Aids	Non-spillable Wet	Nickel-metal Hydride	Dry Batteries	Spillable Batteries	Lithium Ion Batteries
Battery Requirement	Comply with SP A67	Comply with SP A199	Comply with SP A123	Fitted with spill-resistant vent caps (if feasible)	UN 38.3 tested
Battery to be Remained / Removed	△ Can remain if the design of the mobility aid can provide adequate protection to the batter(ies) and that they can be securely attached to the mobility aid, or can be removed			Can remain if loaded in an upright position. If not, the battery needs to be removed	△ Can remain if the design of the mobility aid can provide adequate protection to the batter(ies) and that they can be securely attached to the mobility aid, or can be removed
Number of Spare Batteries Permitted (in addition to the removed batteries, if applicable)	1	2	2	None	1 battery of <u>no more than 300 Wh</u> ; or 2 batteries, <u>each of no more than 160 Wh</u>
Packaging Requirement for Battery	Strong, rigid packagings				Can be in protective pouches
Marking & Labelling Requirement	Battery-powered mobility aid label (Figure 3)			If the battery remains installed, applies the battery-powered mobility aid label (Figure 3). If the battery is removed, the battery must be <u>Marked</u> "BATTERY, WET, WITH WHEELCHAIR" or "BATTERY, WET, WITH MOBILITY AID" and <u>Labelled</u> "Corrosive" (Figure 1) and "Orientation" (Figure 2)	Battery-powered mobility aid label (Figure 3)
Loading Location of Spare & Removed Batteries	Cargo compartment				Passenger cabin
Notification to Pilot-in-Command	Yes				



Examples of Mobility Aids that Provide Adequate Protection to the Battery(ies) by Design



Frequently Asked Questions

1. How do I determine the Watt-hour rating for a lithium ion battery?

The Watt-hour (Wh) rating is a measure by which lithium ion batteries are regulated. Section I lithium ion batteries manufactured after 31 December 2011 and Section IB and Section II lithium ion batteries manufactured after 1 January 2009 are required to be marked with the Watt-hour rating on the outside case.

You can also arrive at the number of Watt-hours your battery provides if you know the battery's nominal voltage (V) and capacity in ampere-hours (Ah):

$$\text{Ah} \times \text{V} = \text{Wh}$$

Note:

If only the milliampere-hours (mAh) are marked on the battery then divide that number by 1000 to get ampere-hours (Ah) (i.e. 4400 mAh / 1000 = 4.4 Ah).

2. How can batteries be effectively protected against short circuit?

Methods to protect against short-circuit include, but are not limited to:

- a) the battery packs of installed batteries are often fully enclosed by the casing which protects the terminals from short-circuit;
- b) exposed terminals or connectors must be protected with non-conductive caps, non-conductive tape or by other appropriate means;
- c) removed batteries must be fully enclosed within inner packagings made of non-conductive material (such as a plastic bag) and kept away from conductive items.

If not impact resistant, the outer packaging must not be used as the sole means of protecting the battery terminals from damage or short-circuiting. Removed batteries should be packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short-circuit.

Terminal protection methods include, but are not limited to the following:

- a) securely attaching covers of sufficient strength to protect the terminals;
- b) placing the battery in a rigid plastic package;
- c) constructing the battery with terminals that are recessed or otherwise protected so that the terminals will not be subjected to damage if the package is dropped.

3. What if the passenger does not provide advance notification or obtain approval from the operator in advance of travel?

If the passenger cannot provide pre-notification, for example, if they need to travel at short notice, the airport and operator must make all reasonable efforts to provide the special assistance to enable the passenger to travel. However, if an operator is unable to satisfy itself of the steps required for a battery-powered mobility aid to be carried safely, its carriage may be denied.

4. How do you ensure electrical circuits are isolated?

The passenger travelling with the device should be asked prior to loading if this information has not been provided in advance. Details will also be available in the device manufacturer's instructions.

Depending upon the design of the mobility aid, the following methods are preferable for ensuring the electrical circuits are isolated:

- a) if a key is fitted, switch off the device, remove the key and pass it to the passenger for safekeeping;
- b) remove the joystick module;
- c) separate power cable plugs or connectors as near to the batteries as possible; or
- d) if the design of the mobility aid means that none of the above actions are possible, it is acceptable to:
 - i) "lock out" the mobility aid, e.g. by making a combination of movements with the joystick as instructed by the manufacturer or passenger; or
 - ii) disconnect cables from the battery terminals.

Note:

This option is not recommended as it can be very difficult to do and if not done properly, can increase the risk of short-circuit leading to fire.



Additional Information

Further guidance information is widely available on the internet. Below is a sample list of useful links.

- - IATA Transport of battery-powered wheelchair and mobility aid guidance
<https://www.iata.org/en/programs/passenger/accessibility/>
 - Regulation (EC) No 1107/2006 of the European Parliament and of the Council of 5 July 2006 concerning the rights of disabled persons and persons with reduced mobility when travelling by air
<http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006R1107>
 - Reduced mobility rights – website gives information on passenger rights and provides useful tips for travellers with a disability
<http://www.reducedmobility.eu/>
 - The European Network for Accessible Tourism. ENAT is a non-profit association for organisations that aim to be “frontrunners” in the study, promotion and practice of accessible tourism.
<http://www.accessibletourism.org/>

Note:

IATA is not responsible for the information published on third-party websites.

You may also contact the airline of your choice or your national civil aviation authority if you have any further concerns about travelling with battery-powered wheelchairs or mobility aids.

You can also contact the IATA Dangerous Goods Support team if you have questions or concerns which may not have been addressed in this document: dangood@iata.org.