# LITHIUM BATTERIES GUIDANCE

IN ACCORDANCE WITH THE

IATA DANGEROUS GOODS REGULATIONS 64<sup>TH</sup> EDITION 2023

Next



January 2023

### Lithium Batteries Section Mark - 2023 Update

The lithium battery mark has been revised to remove the requirement for a telephone number to be provided on the mark. There is a transition period until 31 December 2026 during which time the mark shown in the 63rd edition of the DGR may continue to be used.





### 2023 Lithium Batteries Regulations

#### **Defective / Damaged Batteries:**

DHL will **NOT** accept any cells or batteries identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit (e.g. those being returned to the manufacturer for safety reasons).

DHL will **NOT** accept any waste batteries meant for recycling or disposal purposes (regardless of condition).

#### $\rightarrow$ \*A defective battery may not exhibit any damage at all!

Any equipment packed with or containing lithium batteries (in particular equipment returned for repair purposes as part of reverse logistics/service parts program) exhibiting above mentioned condition, must have the **<u>batteries removed</u>** from the equipment in order to be accepted for carriage with DHL.

#### **Important Disclaimer:**

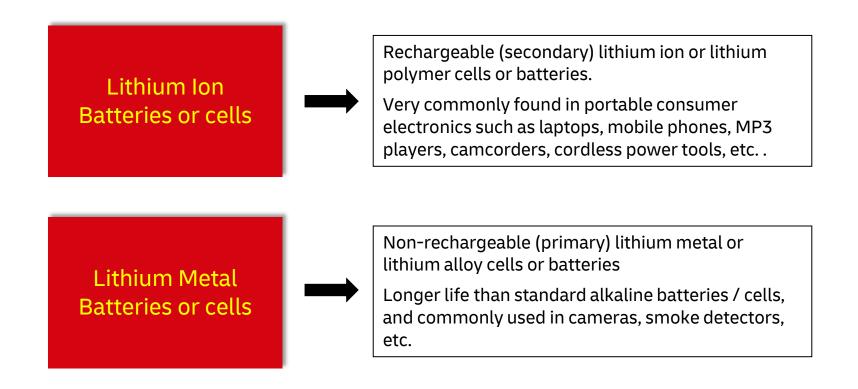
Please note that the information contained in this Guide is purely illustrative and does not replace the study of the Dangerous Goods Regulations to perform any tasks related to the preparation of shipments containing Lithium Batteries.

DHL will not be held responsible for any inaccuracy, error or omission, regardless of cause.



# 2023 Lithium Batteries Regulations: Battery Types

Step 1 - What type of battery are you shipping?





# 2023 Lithium Batteries Regulations: Lithium Ion Batteries



Step 2 - How are you shipping them?



Batteries / cells packed with equipment (separately in the same package)

### Batteries / cells contained in equipment







# 2023 Lithium Batteries Regulations: Lithium Metal Batteries



Step 2 - How are you shipping them?

### Batteries / cells only

Batteries / cells packed with equipment (separately in the same package)

### Batteries / cells contained in equipment







### 2023 Lithium Batteries Regulations: Watt Hour Rating



Step 3 - What is the capacity (Watt Hour\* rating) of your battery?





\*The Watt Hours must be indicated on the outside of the battery, for batteries manufactured as of January 2009. Laptops, mobile phones and other small consumer electronics have batteries with less than 100 Watt Hours (except perhaps some extra duration batteries). Use the formula **Ampere Hours x Voltage** in case the Watt Hour rating is not marked on the battery).

#### $\rightarrow$ Cell

a single encased electrochemical unit

#### $\rightarrow$ Battery

a number of cells electrically connected to each other and packed together in a common housing

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#### $\rightarrow$ Cell

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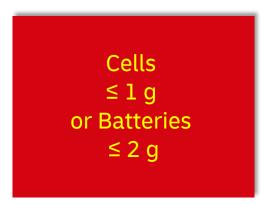
#### $\rightarrow$ Battery

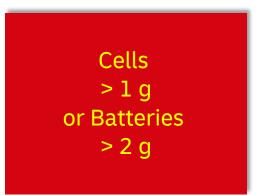
a number of cells electrically connected to each other and packed together in a common housing

### 2023 Lithium Batteries Regulations: Lithium Content



Step 3 – How much lithium does your battery / cell contain?

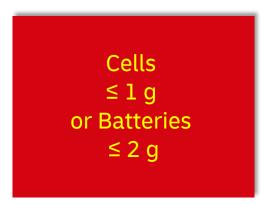


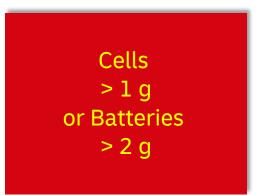


### 2023 Lithium Batteries Regulations: Lithium Content



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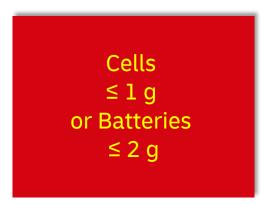


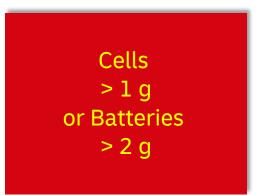


### 2023 Lithium Batteries Regulations: Lithium Content



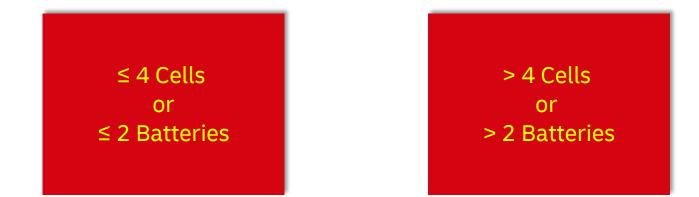
Step 3 – How much lithium does your battery / cell contain?





# 2023 Lithium Batteries Regulations: Lithium Ion Batteries





Please note:

Do not confuse package with overpack. The above refers to the number of cells or batteries per individual package regardless of whether the package is contained in an overpack.

# 2023 Lithium Batteries Regulations: Lithium Ion Batteries



Step 4 – How many packages are in the consignement?





# 2023 Lithium Batteries Regulations: Lithium Metal Batteries





Please note:

Do not confuse package with overpack. The above refers to the number of cells or batteries per individual package regardless of whether the package is contained in an overpack.



# 2023 Lithium Batteries Regulations: Lithium Metal Batteries

Step 4 – How many packages are in the consignement?





### UN3480, Lithium Ion Batteries / Cells – PI965 Section IA

#### Packaging:

Each battery /cell must be protected against a short circuit and placed in an inner packaging that completely encloses the battery /cell, then placed in a strong rigid outer packaging. State of Charge (SoC) of the battery or cell must not exceed 30%.

Cells and batteries must not be packed in the same outer packaging, or placed in an overpack with, dangerous goods classified in Class 1 (except 1.4S), Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) and Division 5.1 (oxidizers).

Maximum **35 kg** net quantity of lithium batteries or cells per package. **Cargo Aircraft Only (CAO)** 

Package test: Packing Group II performance standards. UN specification packaging is required.

**Documentation:** 

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

□ "Dangerous Goods as per associated DGD" or "Dangerous Goods as per associated Shipper's Declaration"

Gargo Aircraft Only" or "CAO"

DHL Services: (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Lithium ion batteries/cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE

ACS - Select DG and mention CAO in the restricted commodity type





ADR



Each battery /cell must be protected against a short circuit and placed in an inner packaging that completely encloses the battery /cell, then placed in a strong rigid outer packaging. Cells and batteries must not be packed in the same outer packaging, or placed in an overpack with, dangerous goods classified in Class 1 (except 1.4S), Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) and Division 5.1 (oxidizers).

#### State of Charge (SoC) of the battery or cell must not exceed 30%.

Maximum 10 kg net quantity of lithium batteries or cells per package Cargo Aircraft Only (CAO).

Package test: 1.2 m drop test.

**Documentation:** 

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

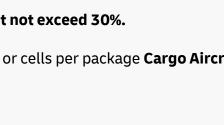
□ "Dangerous Goods as per associated DGD" or "Dangerous Goods as per associated Shipper's Declaration"

Gargo Aircraft Only" or "CAO"

DHL Services: (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. The service is limited due to CAO restrictions. Service Code HE

ACS - Select DG and mention CAO in the restricted commodity type





Labeling / Marking:

# UN3481, Lithium Ion Batteries / Cells – PI966 Section II



#### Packaging:

Cells and/or batteries must be completely enclosed in inner packaging then placed in a strong rigid outer packaging; or must be completely enclosed in inner packaging then placed with equipment in a strong rigid outer packaging.

The equipment must be secured against any movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Maximum number of batteries or cells per package = **those necessary to power the equipment plus 2 spares sets.** (A **set** of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment) Maximum net quantity of lithium batteries or cells per package is **5 kg** for either **Passenger and Cargo Aircraft** or **Cargo Aircraft Only** shipments.

Package test: 1.2 m drop test.

**Documentation:** 

Shipper's Declaration is not required. The following statement must be mentioned on the (air)waybill:

 $\hfill\square$  "Lithium ion batteries in compliance with Section II of PI966"

**DHL Services:** (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Service Code HD

ACS - Select LB and mention Section II in the restricted commodity type



Labeling / Marking:

# UN3481, Lithium Ion Batteries / Cells – PI966 Section I



#### Packaging:

Cells and/or batteries must be completely enclosed in inner packaging then placed in a strong rigid outer packaging; or must be completely enclosed in inner packaging then placed with equipment in a strong rigid outer packaging. The equipment must be secured against any movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Maximum number of batteries /cells per package = **those necessary to power the equipment plus 2 spares sets.** (A **set** of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment).

Maximum net quantity of lithium batteries or cells per package is **5 kg** for **Passenger and Cargo Aircraft** (PAX) and **35 kg** for **Cargo Aircraft Only** (CAO) shipments.

<u>As a DHL requirement</u> cells and batteries must not be packed in the same outer packaging, or placed in an overpack, with dangerous goods classified in Class 1 (except 1.4S), Division 2.1, Class 3, Division 4.1 and Division 5.1.

Package test: Packing Group II performance standards. UN specification packaging is required.

#### **Documentation:**

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

#### □ "Dangerous Goods as per associated DGD" or "Dangerous Goods as per associated Shipper's Declaration"

**Gargo Aircraft Only**" or "**CAO**" (only when CAO was chosen)

**DHL Services:** (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Lithium ion batteries / cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE ADR

ACS - Select DG and mention PAX or CAO as applicable, in the restricted commodity type



Labeling /



When CAO used:

### UN3481, Lithium Ion Batteries / Cells – PI967 Section II



Packaging:The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.Maximum 5 kg net qty of lithium batteries or cells per package (excluding the equipment).Maximum 2 packages per shipment (consignment).	Labeling / Marking: No requirements.
Package test: No requirements.	
Documentation:	
No requirements	
<b>DHL Services: (TDI</b> = Time Definite International , <b>ACS</b> = Air Capacity Sales)	
<b>TDI</b> - No requirements	
ACS - No requirements	

### UN3481, Lithium Ion Batteries / Cells – PI967 Section II



Packaging:	<u>Labeling /</u> Marking:
The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained. Maximum net quantity of lithium batteries or cells per package is <b>5 kg</b> (excluding the equipment) for either <b>Passenger and Cargo Aircraft</b> or <b>Cargo Aircraft Only</b> shipments.	UN3481
	Note:
	The mark is not required for packages containing only <b>button cell batteries</b> installed in equipment (including circuit boards).
Package test: Strong rigid outer packaging equivalent to its capacity and intended use.	
Documentation:	
Shipper's Declaration is not required. The following statement must be mentioned on the (air)waybill:	
"Lithium ion batteries in compliance with Section II of PI967" Note: The statement is not required for packages containing only button cell batteries installed in equipment (including circuit boards).	
DHL Services: (TDI = Time Definite International , ACS = Air Capacity Sales)	
TDI - Account must be approved. Service Code HV	
ACS - Select LB and mention Section II in the restricted commodity type	



Labeling / Marking:

When CAO used:

ADR

#### Packaging:

The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained. Maximum net quantity of lithium batteries or cells per package (excluding the equipment) is **5 kg** for **Passenger and Cargo Aircraft** (PAX) and **35 kg** for **Cargo Aircraft Only** (CAO) shipments.

<u>As a DHL requirement</u> cells and batteries must not be packed in the same outer packaging, or placed in an overpack, with dangerous goods classified in Class 1 (except 1.4S), Division 2.1, Class 3, Division 4.1 and Division 5.1.

Package test: Strong rigid outer packaging equivalent to its capacity and intended use.

**Documentation:** 

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

**Dangerous Goods as per associated DGD**" or **"Dangerous Goods as per associated Shipper's Declaration**"

**Gargo Aircraft Only**" or "CAO" (only when CAO was chosen)

**<u>DHL Services</u>** (TDI = Time Definite International , **ACS** = Air Capacity Sales):

TDI - Account must be approved. Lithium ion batteries / cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE

ACS - Select DG and mention PAX or CAO as applicable, in the restricted commodity type

### UN3090, Lithium Metal Batteries / Cells – PI968 Section IA

#### Packaging:

Each battery /cell must be protected against a short circuit and placed in an inner packaging that completely encloses the battery /cell, then placed in a strong rigid outer packaging. Cells and batteries must not be packed in the same outer packaging, or placed in an overpack with, dangerous goods classified in Class 1 (except 1.4S), Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) and Division 5.1 (oxidizers).

Maximum 35 kg net quantity of lithium batteries or cells per package. Cargo Aircraft Only (CAO)

Package test: Packing Group II performance standards. UN specification packaging is required.

**Documentation:** 

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

**"Dangerous Goods as per associated DGD**" or **"Dangerous Goods as per associated Shipper's Declaration**"

Gargo Aircraft Only" or "CAO"

DHL Services: (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Lithium metal batteries/cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE

ACS - Select DG and mention CAO in the restricted commodity type. Shipping ACS consignments to, from or within the Asia Pacific region is possible for RCG approved shipments on approved routings only







### UN3090, Lithium Metal Batteries / Cells – PI968 Section IB

#### Packaging:

Each battery /cell must be protected against a short circuit and placed in an inner packaging that completely encloses the battery /cell, then placed in a strong rigid outer packaging.

Cells and batteries must not be packed in the same outer packaging, or placed in an overpack with, dangerous goods classified in Class 1 (except 1.4S), Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) and Division 5.1 (oxidizers).

Maximum **2.5 kg** net quantity of lithium batteries or cells per package **Cargo Aircraft Only (CAO)**.

-

**Documentation:** 

Package test: 1.2 m drop test.

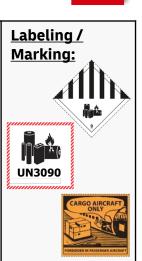
Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

□ "Dangerous Goods as per associated DGD" or "Dangerous Goods as per associated Shipper's Declaration"

Gargo Aircraft Only" or "CAO"

**DHL Services:** (TDI = Time Definite International , ACS = Air Capacity Sales)

- TDI Account must be approved. Forbidden in TDI Express to, from or within the Asia Pacific region due to air carriers restrictions. Service Code HE
- ACS Select DG and mention CAO in the restricted commodity type. Shipping ACS consignments to, from or within the Asia Pacific region is possible for RCG approved shipments on approved routings only







Cells and/or batteries must be completely enclosed in inner packaging then placed in a strong rigid outer packaging; or must be completely enclosed in inner packaging then placed with equipment in a strong rigid outer packaging.

The equipment must be secured against any movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Maximum number of batteries /cells per package = **those necessary to power the equipment plus 2 spares sets.** (A **set** of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment)

Maximum net quantity of lithium batteries or cells per package is **5 kg** for either **Passenger and Cargo Aircraft** or **Cargo Aircraft Only** shipments.

Package test: 1.2 m drop test.

**Documentation:** 

Shipper's Declaration is not required. The following statement must be mentioned on the (air)waybill:

□ "Lithium metal batteries in compliance with Section II of PI969"

**DHL Services:** (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Service Code HM

ACS - Select LB and mention Section II in the restricted commodity type





Labeling / Marking:

# UN3091, Lithium Metal Batteries / Cells – PI969 Section I



#### Packaging:

Cells and/or batteries must be completely enclosed in inner packaging then placed in a strong rigid outer packaging; or must be completely enclosed in inner packaging then placed with equipment in a strong rigid outer packaging.

The equipment must be secured against any movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

Maximum number of batteries /cells per package = **those necessary to power the equipment plus 2 spares sets.** (A **set** of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment)

Maximum net quantity of lithium batteries or cells per package is **5 kg** for **Passenger and Cargo Aircraft** (PAX) and **35 kg** for **Cargo Aircraft Only** (CAO) shipments.

<u>As a DHL requirement</u> cells and batteries must not be packed in the same outer packaging, or placed in an overpack, with dangerous goods classified in Class 1 (except 1.4S), Division 2.1, Class 3, Division 4.1 and Division 5.1.

Package test: Packing Group II performance standards. UN specification packaging is required.

#### **Documentation:**

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

**"Dangerous Goods as per associated DGD**" or **"Dangerous Goods as per associated Shipper's Declaration**"

Gargo Aircraft Only" or "CAO" (only when CAO was chosen)

**DHL Services:** (TDI = Time Definite International , ACS = Air Capacity Sales)

TDI - Account must be approved. Lithium metal batteries / cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE

ACS - Select DG and mention PAX or CAO as applicable in the restricted commodity type





When CAO used:



**ADR** 

# UN3091, Lithium Metal Batteries / Cells – PI970 Section II



Packaging:The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.Maximum net quantity of of lithium batteries or cells per package (excluding the equipment) is 5 kg.Maximum 2 packages per shipment (consignment).	Labeling / Marking: No requirements.
Package test: No requirements.	
Documentation:	
No requirements	
DHL Services: (TDI = Time Definite International , ACS = Air Capacity Sales)	
TDI - No requirements	
ACS - No requirements	



#### Labeling / Packaging: Marking: The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained. Maximum net quantity of lithium batteries or cells per package is **5 kg** (excluding the equipment) for either Passenger and Cargo Aircraft or Cargo Aircraft Only shipments. Note: The mark is not required for packages containing only **button cell batteries** installed in equipment **Package test:** Strong rigid outer packaging equivalent to its capacity and intended use. (including circuit boards). **Documentation:** Shipper's Declaration is not required. The following statement must be mentioned on the (air)waybill: "Lithium metal batteries in compliance with Section II of PI970" Note: The statement is not required for packages containing only button cell batteries installed in equipment (including circuit boards). **DHL Services: (TDI** = Time Definite International , **ACS** = Air Capacity Sales) **TDI** - Account must be approved. Service Code **HW ACS** - Select **LB** and mention **Section II** in the restricted commodity type

#### Packaging:

The equipment must be packed in strong rigid outer packaging constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.

The quantity of lithium metal contained in any piece of equipment must not exceed 500 g per battery and 12 g per cell.

Maximum net quantity of lithium batteries or cells per package (excluding the equipment) is **5 kg** for **Passenger and Cargo Aircraft** (PAX) and **35 kg** for **Cargo Aircraft Only** (CAO) shipments.

<u>As a DHL requirement</u> cells and batteries must not be packed in the same outer packaging, or placed in an overpack, with dangerous goods classified in Class 1 (except 1.4S), Division 2.1, Class 3, Division 4.1 and Division 5.1.

Package test: Strong rigid outer packaging equivalent to its capacity and intended use.

**Documentation:** 

Shipper's Declaration is required. The following statement must be mentioned on the (air)waybill:

□ "Dangerous Goods as per associated DGD" or "Dangerous Goods as per associated Shipper's Declaration"

**Gargo Aircraft Only**" or "CAO" (only when CAO was chosen)

**DHL Services** (TDI = Time Definite International , **ACS** = Air Capacity Sales):

TDI - Account must be approved. Lithium metal batteries / cells packed according to this section are not accepted in TDI Express when transported via road to/from an ADR member state. Service Code HE

ACS - Select DG and mention PAX or CAO as applicable in the restricted commodity type







Labeling / Marking:

When CAO used:



### **ADR Member States**



- A Albania, Andorra, Armenia, Austria, Azerbaijan
- B Belarus, Belgium, Bosnia and Herzegovina, Bulgaria
- C Croatia, Cyprus, Czech Republic
- D Denmark
- E Estonia
- F Finland, France
- G Germany, Greece, Georgia
- H Hungary
- I Iceland, Ireland, Italy
- K Kazakhstan
- L Latvia, Liechtenstein, Lithuania, Luxembourg
- M Malta, Montenegro, Morocco, Republic of Moldova, North Macedonia
- N Netherlands, Nigeria, Norway
- P Poland, Portugal
- R Romania, Russian Federation
- S San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland
- T Tajikistan, Tunisia, Turkey
- U Uganda, Ukraine, United Kingdom, Uzbekistan