Lithium Battery

A practical maritime dangerous goods reference

Lithium ion batteries, lithium ion batteries contained in equipment and lithium ion batteries packed with equipment

UN 3480 and UN 3481 under IMDG Code Amendment 42-24

For shippers, freight forwarders, NVOCCs, warehouse operators, dangerous goods officers, ship's officers and terminal operators.

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This eBook covers lithium ion cells and batteries. Lithium metal batteries (UN 3090, UN 3091) and sodium ion batteries (UN 3551, UN 3552) have their own entries and are outside its scope, although special provision 188 and several packing instruction paragraphs quoted here apply to them as well.

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Foreword

Lithium ion batteries are among the most frequently shipped dangerous goods in sea transport, and classification errors are a common source of mis-declaration in dangerous goods documentation.

Most errors come from using the three descriptions loosely: lithium ion batteries, lithium ion batteries contained in equipment, and lithium ion batteries packed with equipment. They are not interchangeable. Each has its own proper shipping name, its own treatment in packing instruction P903, and its own marking and documentation consequences. This eBook explains what separates them, how special provisions 188, 360 and 390 affect the choice, and what the consignor does next. All references are to IMDG Code Amendment 42-24.

It is written for people who prepare, accept, handle or document lithium ion battery shipments:

- Shippers preparing dangerous goods declarations and selecting the UN number and proper shipping name
- Freight forwarders and NVOCCs consolidating cargo and confirming classification before booking
- Warehouse operators and packing facilities responsible for packaging, marking and labelling at despatch
- Dangerous goods officers and compliance managers preparing documentation and internal audits
- Ship’s officers and terminal operators who need to understand the entries for acceptance and stowage

1. Why lithium ion batteries have more than one UN number

The Dangerous Goods List has two lithium ion entries: **UN 3480 LITHIUM ION BATTERIES (including lithium ion polymer batteries)** and **UN 3481**, which covers both **LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT** and **LITHIUM ION BATTERIES PACKED WITH EQUIPMENT** (including lithium ion polymer batteries). Special provision 188 explains the reason for separate entries: they facilitate transport by specific modes and enable different emergency response actions. Using the wrong entry is a mis-declaration.

The deciding factor is the physical relationship between the battery and the equipment at the time of transport.

Configuration	UN number	Relationship	Packing instruction P903 paragraph
Batteries alone	UN 3480	Batteries shipped with no equipment in the same outer packaging	(1) cells and batteries; (2) for a cell or battery of 12 kg or more with a strong, impact-resistant casing
Contained in equipment	UN 3481	Battery installed in the apparatus it powers	(4) cells or batteries contained in equipment

Configuration	UN number	Relationship	Packing instruction P903 paragraph
Packed with equipment	UN 3481	Battery and equipment in the same outer packaging, battery not installed	(3) cells or batteries packed with equipment
Both in one package	UN 3481	Some batteries installed, some packed alongside	(5) both configurations; marking under SP 390

2. Definitions

2.1 Cell

The UN Manual of Tests and Criteria, Part III, 38.3.2.3 defines a cell as the basic electrochemical unit, characterized by an anode, cathode and electrolyte, that is a source of electrical energy obtained by direct conversion of chemical energy. A single cell battery as defined in 38.3.2.3 is considered a “cell” and is transported according to the requirements for cells (SP 188).

2.2 Battery

Two or more cells electrically connected together and fitted with devices necessary for use, for example a case, terminals, marking and protective devices (Manual of Tests and Criteria, Part III, 38.3.2.3). The note to 2.9.4.1 states that batteries shall be of a type proved to meet the testing requirements of 38.3, irrespective of whether the cells of which they are composed are of a tested type. The assembled battery is therefore type-tested as a complete unit.

2.3 Equipment

> **Equipment** means apparatus for which the cells or batteries will provide electrical power for its operation (P903, 4.1.4.1, and SP 188 .8). A vehicle powered only by lithium ion batteries is a vehicle, not equipment: SP 360 routes it to UN 3556 VEHICLE, LITHIUM ION BATTERY POWERED.

3. Classification: IMDG Code 2.9.4

Section 2.9.4 is the starting point. Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form are assigned to UN 3090, 3091, 3480 or 3481 as appropriate. They may be transported under these entries if they meet 2.9.4.1 to 2.9.4.7, which include:

- **2.9.4.1** each cell or battery is of a type proved to meet each test in the Manual of Tests and Criteria, Part III, 38.3
- **2.9.4.2 to 2.9.4.4** safety venting or design to preclude violent rupture, protection against external short circuit, and protection against reverse current flow in parallel cell arrangements
- **2.9.4.5** manufacture under a quality management programme
- **2.9.4.7** manufacturers and subsequent distributors make the test summary available (button cells installed in equipment excepted)

Special provision 310 relaxes some of these provisions for production runs of not more than 100 cells or batteries and for pre-production prototypes transported for testing (packing instruction P910 or LP905).

3.1 Classification logic

Apply the questions in sequence and stop at the first YES.

Step	Question	Result
Q1	Is the shipment a vehicle powered only by a lithium ion battery (electric bicycle, e-scooter, electric wheelchair, electric car)?	**YES: UN 3556 VEHICLE, LITHIUM ION BATTERY POWERED** (SP 360, SP 388). Do not use UN 3480 or UN 3481.
Q2	Are the batteries shipped alone, with no equipment in the same outer packaging (spare packs, replacement batteries, bulk cells)?	**YES: UN 3480 LITHIUM ION BATTERIES** (including lithium ion polymer batteries). P903(1).

Step	Question	Result
Q3	Is the battery installed in the equipment it powers (laptop, phone, tablet, tool with battery in the body, scanner, smart watch, fitted medical device)?	**YES: UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT**. P903(4); SP 188 .5 where SP 188 applies.
Q4	Is the battery separate from the equipment but in the same outer packaging as a commercial unit?	**YES: UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT**. P903(3).

If a package holds batteries both installed in equipment and packed with equipment, see SP 390 (Section 8).

4. The three entries in detail

4.1 UN 3480 LITHIUM ION BATTERIES

This entry applies when lithium ion cells or batteries are shipped alone. No equipment is present in the same outer packaging. Packing instruction P903 paragraph (1) applies: drums, boxes or jerricans conforming to the packing group II performance level, with the cells or batteries protected against movement and short circuit.

> **Proper shipping name:** LITHIUM ION BATTERIES (including lithium ion polymer batteries)

Typical examples:

- Replacement e-bike or e-scooter battery packs shipped to a dealer without the vehicle
- Lithium ion cells shipped in bulk from a cell manufacturer to a battery pack assembler
- Spare power tool battery packs shipped separately from the tool
- Industrial energy-storage battery modules shipped without the inverter or storage cabinet
- Replacement phone or laptop batteries sold and shipped as standalone items

4.2 UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

This entry applies when the battery is installed in the equipment, as a fitted component of the apparatus. In most cases the battery cannot be removed without disassembling the device.

> **Proper shipping name:** LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries)

Vehicles powered only by lithium ion batteries are not assigned to this entry. SP 360 routes them to UN 3556.

Packing instruction P903 paragraph (4) requires strong outer packagings, constructed to prevent accidental operation during transport. Large equipment can be offered unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained. Where SP 188 is used, SP 188 .5 requires the batteries to be protected from damage and short circuit and the equipment to have an effective means of preventing accidental activation, except for devices intentionally active in transport (RFID transmitters, watches, sensors) that cannot generate a dangerous evolution of heat.

Typical examples:

- Laptops, mobile phones and tablets with non-removable batteries
- Cordless power tools (drills, jigsaws, sanders) with the battery installed in the tool body
- Handheld barcode scanners and mobile data terminals with integrated batteries
- Medical devices with fitted cells, for example pulse oximeters, infusion pumps and defibrillators
- Smart watches, fitness trackers, e-readers and portable GPS devices with built-in batteries
- Battery-powered equipment such as lawnmowers, cleaning machines, model boats and model aircraft (SP 388 examples of equipment)

4.3 UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

This entry applies when the battery and the equipment are in the same outer packaging but the battery is not installed in the apparatus.

> **Proper shipping name:** LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)

Packing instruction P903 paragraph (3) requires either packagings conforming to paragraph (1) placed with the equipment in an outer packaging, or packagings that completely enclose the cells or batteries placed with the equipment in a packaging conforming to paragraph (1). The equipment is secured against movement within the outer packaging.

Typical examples:

- A cordless drill in a retail box with the battery pack bagged separately in the same carton
- A laptop shipped with a spare battery pack wrapped separately in the same box
- An electric toothbrush boxed with a detachable replacement battery
- A GPS device boxed with a separately packaged rechargeable battery
- A lawnmower shipped with a separately wrapped battery pack in the same outer packaging

5. Side-by-side comparison

Factor	UN 3480	UN 3481
Proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)
Battery–equipment relationship	Batteries alone, no equipment in the package	Installed in the equipment, or co-packed alongside it
Class / packing group	Class 9; none assigned	Class 9; none assigned
Limited quantity (col. 7a)	0	0
Excepted quantity (col. 7b)	E0	E0
Special provisions (col. 6)	188, 230, 310, 348, 376, 377, 384, 387	188, 230, 310, 348, 360, 376, 377, 384, 387, 390
SP 188 .8: 30 kg gross mass limit	Applies	Does not apply when installed in or packed with equipment
SP 188 .7: 1.2 m drop test	Applies	Does not apply when batteries are installed in equipment
Packing instructions (col. 8)	P903, P908, P909, P910, P911; LP903, LP904, LP905, LP906	P903, P908, P909, P910, P911; LP903, LP904, LP905, LP906
Stowage (col. 16a)	Category A; SW19*	Category A; SW19*
EmS (col. 15)	F-A, S-I	F-A, S-I

* SW19: for batteries transported in accordance with special provisions 376 or 377, category C, unless transported on a short international voyage. Packing instructions P908 and LP904 apply to damaged or defective batteries, P909 to batteries for disposal or recycling, P910 and LP905 to prototypes and small production runs, and P911 and LP906 to damaged or defective batteries liable to rapid disassembly or dangerous reaction.

5.1 Special provisions in column 6

SP	Subject
188	Cells and batteries within the Wh limits and conditions are not subject to other provisions of the Code
230	Lithium cells and batteries may be transported under the entry if they meet 2.9.4
310	Production runs of not more than 100 cells or batteries, and prototypes transported for testing; statement “Transport in accordance with special provision 310” on the transport document
348	Lithium batteries manufactured after 31 December 2011 are marked with the Watt hour rating on the outside case
360	Vehicles powered only by lithium batteries go to UN 3556, 3557 or 3558; batteries installed in a CTU to provide external power go to UN 3536
376	Damaged or defective cells and batteries
377	Cells and batteries transported for disposal or recycling; statement “Transport in accordance with special provision 377” on the transport document
384	Label Model No. 9A; placards for cargo transport units correspond to Model No. 9
387	Batteries containing both primary lithium metal cells and rechargeable lithium ion cells
390	Package containing batteries both contained in equipment and packed with equipment (UN 3481 only)

6. Special provision 188

Special provision 188 states that cells and batteries offered for transport are not subject to other provisions of the Code if they meet all of its conditions. It applies to UN 3480 and to both configurations of UN 3481.

Watt-hour limits

- Lithium ion cell: watt-hour rating not more than 20 Wh (.1)
- Lithium ion battery: watt-hour rating not more than 100 Wh, marked on the outside case except for batteries manufactured before 1 January 2009 (.2)

Other conditions

- Each cell or battery meets 2.9.4.1, 2.9.4.5, 2.9.4.6 if applicable, and 2.9.4.7 (.3)
- Except when installed in equipment, cells and batteries are packed in inner packagings that completely enclose them, protected against short circuit including contact with conductive material in the same packaging, and placed in strong outer packagings conforming to 4.1.1.1, 4.1.1.2 and 4.1.1.5 (.4)
- Cells and batteries installed in equipment are protected from damage and short circuit, and the equipment has an effective means of preventing accidental activation (.5)
- Each package bears the lithium or sodium ion battery mark in 5.2.1.10 (.6). The mark is not required on packages containing only button cell batteries installed in equipment (including circuit boards), or on packages containing no more than four cells or two batteries installed in equipment where there are not more than two packages in the consignment. An overpack carries the mark, or shows the mark clearly, and is marked OVERPACK (letters at least 12 mm high)
- Except when cells or batteries are installed in equipment, each package withstands a 1.2 m drop test in any orientation without damage to cells or batteries, without shifting of the contents so as to allow battery to battery contact, and without release of contents (.7)
- Except when cells or batteries are installed in or packed with equipment, packages do not exceed 30 kg gross mass (.8). The 30 kg limit therefore applies in practice to UN 3480 shipments

SP 188 does not remove the UN number. The goods remain UN 3480 or UN 3481 and the battery mark showing that number is required. SP 188 removes the goods from the other provisions of the Code, such as the dangerous goods declaration and the Class 9 label, but not from the conditions above.

6.1 Do common products such as laptops, barcode scanners and smart watches travel as Class 9?

It depends on the watt-hour rating of the battery. Most consumer electronics are within the SP 188 limits and are therefore not subject to the full Class 9 provisions. The table gives indicative values only; use the Wh rating marked on the battery.

Product	Typical cell Wh	Typical battery Wh	Class 9 or SP 188?	UN number
Consumer laptop (non-removable battery)	3–6 Wh	40–100 Wh	SP 188 if ≤ 100 Wh; Class 9 if > 100 Wh	UN 3481 contained in equipment
Smartphone (non-removable battery)	3–15 Wh	3–15 Wh	SP 188 (≤ 20 Wh cell, ≤ 100 Wh battery)	UN 3481 contained in equipment
Smart watch (non-removable battery)	0.3–1 Wh	0.3–1 Wh	SP 188 (well below the limits)	UN 3481 contained in equipment
Tablet (non-removable battery)	3–6 Wh per cell	25–50 Wh	SP 188 (≤ 100 Wh)	UN 3481 contained in equipment
Handheld barcode scanner / mobile terminal	1–5 Wh	3–15 Wh	SP 188 (≤ 100 Wh)	UN 3481 contained in equipment
Laptop spare battery co-packed with laptop	3–6 Wh	40–100 Wh	SP 188 if ≤ 100 Wh; Class 9 if > 100 Wh	UN 3481 packed with equipment
Replacement e-bike battery (no vehicle)	about 10 Wh per cell	400–700 Wh	Class 9 (exceeds the 100 Wh battery limit)	UN 3480
Bulk lithium ion cells, manufacturer to assembler	2–10 Wh per cell	n/a	SP 188 if ≤ 20 Wh per cell; Class 9 if > 20 Wh per cell	UN 3480

Watt-hour marking. Lithium ion batteries subject to SP 188 are marked with the Wh rating on the outside case, except batteries manufactured before 1 January 2009 (SP 188 .2). SP 348 requires the Wh marking on lithium batteries manufactured after 31 December 2011.

7. Special provision 360: battery-powered vehicles and cargo transport units

SP 360 appears in column 6 for UN 3481. It directs the shipper away from UN 3481 for two categories of goods. Vehicles powered only by lithium metal, lithium ion or sodium ion batteries are assigned to UN 3556 VEHICLE, LITHIUM ION BATTERY POWERED, UN 3557 VEHICLE, LITHIUM METAL BATTERY POWERED or UN 3558 VEHICLE, SODIUM ION BATTERY POWERED, as applicable. Lithium batteries installed in cargo transport units, designed only to provide power external to the unit, are assigned to UN 3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT.

SP 388 defines the vehicles concerned as self-propelled apparatus designed to carry one or more persons or goods. Examples listed there include:

- Cars, motorcycles, scooters and bicycles with a motor (pedal cycles with a motor)
- Wheelchairs, lawn tractors, and self-propelled farming and construction equipment
- Self-balancing vehicles and vehicles not equipped with at least one seating position
- Boats and aircraft

Equipment or vehicle? SP 388 gives lawnmowers, cleaning machines, model boats and model aircraft as examples of equipment. Equipment powered by lithium ion batteries is assigned to UN 3481 contained in or packed with equipment, as appropriate. A self-propelled apparatus designed to carry persons or goods is a vehicle.

8. Special provision 390: mixed packages

A package may contain batteries that are installed in equipment and batteries packed alongside equipment. SP 390 gives the marking and documentation rule:

- The package is marked “UN 3481 Lithium ion batteries packed with equipment”
- The transport document indicates “UN 3481 Lithium ion batteries packed with equipment”
- Button cell batteries installed in equipment (including circuit boards) need not be considered
- If the package also contains lithium metal batteries packed with and contained in equipment, the package is marked and documented for both battery types, UN 3481 and UN 3091

9. Examples: classification at a glance

Entry	When it applies	Examples
UN 3480 LITHIUM ION BATTERIES	Batteries shipped alone, no equipment in the same outer packaging	Replacement e-bike or e-scooter packs shipped without the vehicle; cells from a manufacturer to a pack assembler; spare power tool packs shipped separately; industrial battery modules without the inverter; replacement phone or laptop batteries sold standalone
UN 3481 CONTAINED IN EQUIPMENT	Battery installed in the apparatus; the equipment gives the battery physical protection	Laptops, phones and tablets with integrated batteries; cordless tools with the battery in the tool body; scanners and mobile data terminals; fitted medical devices; smart watches; e-readers; GPS devices; lawnmowers and cleaning machines with the battery installed
UN 3481 PACKED WITH EQUIPMENT	Battery separate from the equipment, both in the same outer packaging as a commercial unit	Cordless drill box with the pack bagged alongside; laptop with a spare battery wrapped separately in the same box; electric toothbrush with a detachable replacement battery; GPS device with a separately packaged battery
UN 3556 VEHICLE, LITHIUM ION BATTERY POWERED	Vehicle powered only by lithium ion batteries, transported with the batteries installed (SP 360, SP 388)	Electric bicycles, e-scooters, electric wheelchairs, electric cars

10. Classification decision guide

Apply these questions in sequence for any lithium ion battery shipment:

Q	Question	Answer
Q1	Is the shipment a vehicle powered only by a lithium ion battery, such as an electric bicycle, scooter, wheelchair or car?	YES: UN 3556 per SP 360. NO: go to Q2.
Q2	Are the batteries shipped alone, with no equipment in the same outer packaging?	YES: UN 3480. NO: go to Q3.
Q3	Is the battery installed in the equipment, which protects it during transport?	YES: UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT. NO: go to Q4.
Q4	Is the battery separate from the equipment but in the same outer packaging?	YES: UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT.

Then check the watt-hour rating against SP 188 to decide whether full Class 9 provisions apply.

11. Key points

- The UN number follows the physical relationship between the battery and the equipment at the time of transport, not the intended use of the battery.
- UN 3480 applies when batteries are shipped alone. UN 3481 applies when the battery is installed in equipment or packed with it.
- Vehicles powered only by lithium ion batteries are never classified under UN 3481. SP 360 routes them to UN 3556, UN 3557 or UN 3558.
- A cell is the basic electrochemical unit. A battery is two or more cells electrically connected. Each cell and battery type is tested under 38.3 unless SP 310 applies.
- Equipment means apparatus for which the cells or batteries provide electrical power for its operation (P903 and SP 188 .8).
- Under SP 188, a lithium ion cell of not more than 20 Wh and a battery of not more than 100 Wh are not subject to other provisions of the Code, provided every SP 188 condition is met. The UN number battery mark is still required, subject to the exceptions in SP 188 .6.
- The 30 kg gross mass limit in SP 188 .8 does not apply to cells or batteries installed in or packed with equipment.
- P903 has five paragraphs: (1) cells and batteries, (2) heavy cells and batteries of 12 kg or more, (3) packed with equipment, (4) contained in equipment, (5) both configurations.
- SP 390 governs marking and documentation when one package holds batteries in both configurations.

12. Frequently asked questions

#	Question	Answer
1	**What is the difference between a cell and a battery?**	A cell is the basic electrochemical unit: anode, cathode and electrolyte. A battery is two or more cells electrically connected and fitted with the devices necessary for use. A single cell battery is treated as a cell. [Manual of Tests and Criteria Part III, 38.3.2.3; SP 188]
2	**How do I decide between UN 3480 and UN 3481?**	Ask what the physical relationship is between battery and equipment at the time of transport. Batteries alone with no equipment in the package are UN 3480. Batteries installed in equipment, or co-packed with it, are UN 3481. [2.9.4; DGL]
3	**What is the difference between “contained in equipment” and “packed with equipment”?**	Contained in equipment: the battery is installed in the apparatus. Packed with equipment: the battery is separate but in the same outer packaging. They share UN 3481 but have different proper shipping names and different P903 paragraphs, (4) and (3). [P903, 4.1.4.1; DGL]
4	**Can I use one proper shipping name for both UN 3481 configurations?**	No. They are separate descriptions in the Dangerous Goods List. For a fully regulated Class 9 package, the proper shipping name and UN number are marked on the package (5.2.1.1) and appear on the dangerous goods declaration. A package prepared under SP 188 carries the battery mark with the UN number instead. For mixed packages SP 390 applies. [DGL; 5.2.1.1; SP 390]
5	**Are electric bicycles and scooters classified under UN 3481?**	No. SP 360 and SP 388 route vehicles powered only by lithium ion batteries, including e-bikes, scooters, wheelchairs and cars, to UN 3556. [SP 360; SP 388]
6	**What are the watt-hour limits for SP 188?**	Lithium ion cell: not more than 20 Wh. Lithium ion battery: not more than 100 Wh. Cells and batteries above these limits are transported as full Class 9 under the applicable packing instruction. [SP 188 .1, .2]

#	Question	Answer
7	**If my shipment qualifies under SP 188, do I need a dangerous goods declaration?**	SP 188 states that the cells and batteries are not subject to other provisions of the Code, so the dangerous goods declaration is not required. The SP 188 conditions must still be met, including the battery mark showing UN 3480 or UN 3481 on each package, subject to the exceptions in SP 188 .6. [SP 188; 5.2.1.10]
8	**Does the 30 kg gross mass limit apply to UN 3481?**	No. SP 188 .8 excepts cells or batteries installed in or packed with equipment, so the limit applies in practice to UN 3480 packages. [SP 188 .8]
9	**What does the Code say about state of charge?**	The Dangerous Goods List entries and P903 for UN 3480 and UN 3481 set no state of charge limit. State of charge appears in the packaging performance assessment in P911 and LP906, which cover damaged or defective batteries liable to rapid disassembly or dangerous reaction; where the state of charge is not known, the assessment uses the highest possible state of charge. Damaged or defective batteries are dealt with under SP 376. [P911; LP906; SP 376]
10	**Does a laptop qualify as Class 9 when shipped by sea?**	Only if the battery exceeds 100 Wh. A laptop with a battery of 100 Wh or less can use SP 188. It remains UN 3481 contained in equipment and the battery mark is required on the package, subject to SP 188 .6. [SP 188; 5.2.1.10]
11	**Which packing instruction applies to UN 3480 and UN 3481?**	P903, and LP903 for large packagings. P903 has five paragraphs: (1) cells and batteries, (2) a cell or battery of 12 kg or more with a strong, impact-resistant casing, (3) packed with equipment, (4) contained in equipment, (5) both configurations. P908, P909, P910, P911, LP904, LP905 and LP906 cover damaged or defective batteries, disposal or recycling, and prototypes. [P903, 4.1.4.1; LP903, 4.1.4.3]
12	**Which label applies to Class 9 packages of UN 3480 and UN 3481?**	Label Model No. 9A, under SP 384. For placarding of cargo transport units the placard corresponds to Model No. 9. [SP 384; 5.2.2.2.2]
13	**Is a dangerous goods declaration required above the SP 188 limits?**	Yes. The transport document carries the dangerous goods description in 5.4.1.4.1: UN number, proper shipping name and class 9 (no packing group is assigned), together with the other 5.4.1 entries such as quantity and package details. SP 310 and SP 377 each add a required statement on the transport document where they are used. [5.4.1; SP 310; SP 377]
14	**What does “equipment” mean in the lithium battery provisions?**	Apparatus for which the cells or batteries will provide electrical power for its operation. The definition appears in P903 and SP 188 .8. A vehicle powered only by lithium ion batteries is dealt with under SP 360 and SP 388. [P903; SP 188 .8; SP 360; SP 388]
15	**What is the 38.3 test requirement and who must comply?**	Each cell and battery is of a type proved to meet each test in the Manual of Tests and Criteria, Part III, 38.3 (tests T.1 to T.8), and the manufacturer maintains a quality management programme. It applies to UN 3480 and both UN 3481 configurations. SP 310 relaxes it for production runs of not more than 100 cells or batteries and for prototypes transported for testing. [2.9.4.1; 2.9.4.5; SP 310]
16	**What are the stowage and segregation requirements?**	Both entries: stowage category A, so on deck or under deck, with EmS F-A and S-I. SW19 applies to batteries under SP 376 or 377: category C, unless on a short international voyage. The Dangerous Goods List shows no segregation group for either entry. [DGL columns 15, 16a, 16b; Chapter 7.1]

#	Question	Answer
17	**What if a package holds batteries both installed in equipment and packed with equipment?**	Apply SP 390. The package is marked and documented as UN 3481 Lithium ion batteries packed with equipment. Button cell batteries installed in equipment need not be considered. P903 paragraph (5) covers the packaging. [SP 390; P903(5)]
18	**Can these entries be carried on passenger ships?**	Stowage category A permits on-deck or under-deck stowage. Carriers may apply their own acceptance conditions, particularly for high-energy batteries or large consignments. [DGL column 16a; Chapter 7.1]
19	**What does SP 348 require?**	Lithium batteries manufactured after 31 December 2011, and sodium ion batteries manufactured after 31 December 2025, are marked with the Watt hour rating on the outside case. The Wh rating also decides whether SP 188 can be used. [SP 348; SP 188 .2]
20	**Which emergency schedules apply to a lithium ion battery fire or spill?**	EmS F-A for fire and S-I for spillage. Lithium ion battery fires can re-ignite after apparent extinguishment, so the space needs continued monitoring. Follow the EmS Guide schedules. [DGL column 15; EmS Guide]

Regulatory references and disclaimer

References. IMDG Code Amendment 42-24, Volumes 1 and 2. UN Manual of Tests and Criteria, seventh revised edition with Amendment 1 (ST/SG/AC.10/11/Rev.7 and Amend.1), as referenced in the Code.

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