Safety Data Sheet

# Section 1. Product and Company Identification.

**1.1 Model Number;** CP108VCOMBO8EU v1

**1.2 Description;** 5 x 10.8V SV10.8 Series Cordless Combo Kit - 2 Batteries
Battery: 10.8Volts. 2Ah. 180 grams.

**1.3 Manufacturer;**
Sealey Group.
Kempson Way,
Bury St. Edmunds,
Suffolk.
IP32 7AR

**1.4 Emergency telephone number;** 44 (0) 1284 757 500 (Office Hours)

**Date of source compilation;** 01/04/2019

# Section 2. Hazards Identification.

Battery is hermetically sealed and does not present a hazard under normal conditions of use.
Inappropriate handling and / or use can cause electrolyte to leak.

**Ingestion:** Contents of an open battery can cause chemical burns of mouth, oesophagus, and gastrointestinal tract.
**Inhalation:** Contents of an open battery can cause respiratory irritation.
**Skin Contact:** Contents of an open battery can cause skin irritation.
**Eye Contact:** Contents of an open battery can cause irritation.

## Section 3. Substances.

| **3.1 Chemical Name** (substance) | **3.1 CAS No.** | **3.2 Concentration Weight** | **Classification** | |
|---|---|---|---|---|
| | | | **Hazard Class & Category Code** | **Hazard Statements** [1] |
| Lithium Nickel Cobalt Manganese Oxide | 182442-95-1 | 25-30% | - | - |
| Graphite Powder | 7782-42-5 | 15-20% | - | - |
| Copper Foil | 7440-50-8 | 5-10% | - | - |
| Aluminium Foil | 7429-90-5 | 5-10% | Flam. Sol. 1<br>Water-react. 2 | H228<br>H261 |
| Lithium Hexafluorophosphate | 21324-40-3 | 0.5-3% | - | - |
| Ethylene Carbonate | 96-49-1 | | - | - |
| Dimethyl Carbonate | 616-38-6 | | Flam. Liq. 2 | H225 |
| Methyl Ethyl Carbonate | 623-53-0 | | - | - |
| Diethyl Carbonate | 105-58-8 | | - | - |
| Polypropylene | 9003-07-0 | 1-2% | - | - |
| Polyvinylidene Fluoride | 24937-79-9 | 0.5-2% | - | - |
| Nickel | 7440-02-0 | 0.7-1% | Carc. 2<br>STOT RE 1<br>Skin Sens. 1 | H351<br>H372<br>H317 |

[1]For full text of Statements, see Section 16.

## Section 4. First Aid Measures.

Lithium Batteries do not pose a risk to eyes or skin under normal circumstances.
In the case of contact with internal substances;

**4.1** Description of first aid measures

**Inhalation**

If breathing difficulties develop, remove the person to fresh air.
Loosen close fitting clothing.
Ensure that person is warm.
If mouth to mouth resuscitation is necessary, the person conducting this must takes steps to reduce the risk of contamination from toxic / corrosive substances that may be present.

**Skin Contact**

Remove contaminated clothing.
Flush affected area(s) with copious amounts of water for at least 15 minutes.
Get medical attention.

**Eye Contact**

Irrigate eyes with water for at least 15 minutes while raising eyelid(s).
Get medical attention.

**Ingestion**

If swallowed, do not induce vomiting. Give large amounts of water but *do not* do this if casualty is unconscious.

Protection of First Aiders:

Use personal protective equipment.
Avoid contact with skin, eyes and clothing.

**4.2.** Most important symptoms and effects, both acute and delayed

No data available.

**4.3.** Indication of any immediate medical attention and special treatment needed

No data available.

## Section 5. Fire Fighting Measures.

**Recommended practice;**
Always ensure that Personal Protection Equipment (PPE) is used.
If a battery becomes hot, immediately remove it from flammable materials and place on a non-combustible surface.
If possible, place a disintegrating device outdoors and allow it to burn out.
**Fire condition; NB; ensure that electrical devices are turned off. Prevent electric shock risk.**

If any batteries are burning, water may not extinguish them, but will cool the adjacent batteries and control the spread of fire.

**5.1.** Extinguishing media

**Extinguishers;**
Only use Graphite based $CO_2$ (Carbon dioxide), Dry Powder or Foam.
Copper powder fire extinguishers, sand, dry ground dolomite or soda ash may also be used. These materials act as smothering agents.

If possible, use a **LITH-X (powdered graphite)** extinguisher on small fires. This material acts as a smothering agent.
*A **sodium chloride powder** extinguisher **IS NOT** suitable for use on Lithium Batteries.*

It may not be possible to extinguish burning lithium batteries. Burning batteries will burn themselves out.
Do not use water with **LITH-X (powdered graphite)**.

- If a LITH-X (powdered graphite) extinguisher is not available;

Use copious amounts of water in a fine spray to swamp a fire.
Continue to use copious amounts of water until the fire is extinguished and the batteries are cooled.
NB: **Lithium reacts with water to form Hydrogen.** The fire will not be extinguished immediately.
Be aware of the increased risk of explosion.

NB; fire-fighting water runoff may be corrosive / toxic and may cause adverse environmental impact.

**5.2.** Special hazards arising from the substance or mixture

**Hazard characteristics;** thermal decomposition can lead to the release of toxic fumes.
**Hazardous combustion products;** carbon dioxide, carbon monoxide, lithium oxide fumes.

**5.3.** Advice for fire-fighters
Fragments may be ejected from a fire.
Fire Fighters should wear self-contained breathing apparatus and appropriate Personal Protective Equipment.

## Section 6. Accidental Release Measures.

**6.1.** Personal precautions, protective equipment and emergency procedures
In the event of battery rupture and leakage,

- ventilate the area.
- wear appropriate protective clothing (see Section 8) to prevent eye and skin contact and to prevent inhalation of vapours or fumes.
- remove sources of ignition.

**6.2.** Environmental precautions
No data available.

**6.3.** Methods and material for containment and cleaning up
Absorb released materials with inert absorbent (dry sand or soil).
Collect released materials into sealed plastic bag or container.
Prevent material from contaminating soil or entering sewers or waterways.
Do not dispose of released materials with domestic waste
Do not allow product to enter ground water, water course or sewerage system.
Dispose of released materials in accordance with local authority regulations.

**6.4.** Reference to other sections
See Section 7 for information on Safe Handling
See Section 8 for information of Personal Protective Equipment.
See Section 13 for information on disposal.

## Section 7. Handling and Storage.

**7.1.** Precautions for safe handling
Never dismantle or modify a battery.
Do not short circuit a battery. A short circuit causes heating and can lead to ignition of surrounding materials.
Physical contact with a short-circuited battery can cause skin burn.
When charging the battery, use dedicated chargers and follow the specified conditions.
Improperly charging a battery may cause the battery to combust.
Lithium batteries for transport by air in a state of charge must have no more than 30% charge of their rated capacity.

**7.2.** Conditions for safe storage, including any incompatibilities
Prevent contact with conductive materials.
Do not allow contact with water.
Store in original container. Keep container tightly closed.
Store in a dry, cool place.
Store at 20 °C (68°F); room temperature
Store away from ignition sources, heat, and incompatible materials.

**7.3.** Specific end use(s)
Intended for use as the battery for the Model Number identified in 1.1 with Description stated in 1.2

## Section 8. Exposure Controls/Personal Protection.

**8.1.** Control parameters
In the event of battery rupture and leakage:
Ventilate the area.
Remove sources of ignition.

**8.2.** Exposure controls
The use of Personal Protective Equipment (PPE) is not necessary under conditions of normal use.
If handling a leaking or ruptured battery, ensure that the following Personal Protective Equipment (PPE) is used.

**Eye/Face Protection**
Chemical grade full face shield

**Skin Protection**
Acid resistant, natural rubber or neoprene gloves.
Protective rubber apron
Appropriate Personal Protection with long sleeves and long trousers.

**Respiratory Protection**
Acid gas filter mask or self-contained breathing apparatus.

## Section 9. Physical and Chemical Properties.

**9.1.** Information on basic physical and chemical properties
**The following information is not a technical specification or sales specification.**

| | |
|---|---|
| (a) Appearance: | Cylindrical Cell |
| (b) Odour: | Not relevant to battery as supplied. |
| (c) Odour threshold; | Not relevant to battery as supplied. |
| (d) pH: | No data available |
| (e) Melting point/freezing point; | Not relevant. |
| (f) Initial boiling point and boiling range; | Not relevant. |
| (g) Flash point; | No data available |
| (h) Evaporation rate; | Not relevant to battery as supplied. |
| (i) Flammability (solid, gas); | No data available |
| (j) Upper/lower flammability or explosive limits; | No data available |
| (k) Vapour pressure; | Not relevant. |
| (l) Vapour density; | Not relevant. |
| (m) Relative density; | Not relevant. |
| (n) Solubility(ies); | Battery insoluble in water. |
| (o) Partition coefficient: n-octanol/water; | Not relevant. |
| (p) Auto-ignition temperature; | No data available |
| (q) Decomposition temperature; | No data available |
| (r) Viscosity; | Not relevant. |
| (s) Explosive properties; | No data available |
| (t) Oxidising properties. | No data available |

**9.2** Other information — No data available

## Section 10. Stability and Reactivity.

| | |
|---|---|
| **10.1.** Reactivity | Stable |
| **10.2.** Chemical stability | Stable under normal conditions. |
| **10.3.** Possibility of hazardous reactions | No data available |
| **10.4.** Conditions to avoid | Mechanical shock.<br>Vibrations during transport are not detrimental to condition.<br>Do not dismantle, crush or install with incorrect polarity.<br>Prevent mechanical / electrical misuse. |
| **10.5.** Incompatible materials | Avoid exposure to heat, open flames and corrosives |
| **10.6.** Hazardous decomposition products | It may release an irritant gas once a electrolyte leakage occurs |

## Section 11. Toxicological Information.

**11.1.** Information on toxicological effects

**Potential health risks;**
**Eye**; Contact with battery contents may cause severe irritation and burns. Eye damage is possible.
**Skin**; Contact with battery contents may cause severe irritation and burns.
Absorption through the skin will cause localized inflammation.
**Ingestion**; may cause severe and permanent damage to the digestive tract. May cause circulatory system failure.
Contents of an open battery can cause serious chemical burns to the mouth, oesophagus and gastrointestinal tract.
**Inhalation;** Inhalation of vapours or fumes released due to heat or leaking batteries may cause respiratory irritation.
Irritation may lead to chemical pneumonitis.
Inhalation can produce chronic productive cough and shortness of breath.

## Section 12. Ecological Information.

When properly used and disposed of correctly, the battery does not present environmental hazard.
Do not release internal components into water ways, wastewater or ground water.

## Section 13. Disposal Considerations.

Disposal of the battery must be in accordance with local authority regulation requirements for hazardous waste treatment and hazardous waste transportation.
The battery should be completely discharged prior to disposal and the terminals taped or capped to prevent short circuit.
Do not dispose of batteries at landfill sites.
Do not incinerate batteries.

## Section 14. Transport Information.

ADR. International Carriage of Dangerous Goods by Road.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** Name and Description | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |

ADR Special Provision 188

Cells and batteries offered for transport are not subject to other provisions of this Code if they meet the following:

(a) For a lithium metal or lithium alloy cell. the lithium content is not more than 1 g, and for a lithium-ion cell, the watt-hour rating is not more than 20 Wh:
(b) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 9, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh. Lithium-ion batteries subject to this provision shall be marked with the watt-hour rating on the outside case, except those manufactured before 1 January 2009;
(c) Each cell or battery meets the provisions of 2.2.9.1.7*(a),(e),(f) if applicable and (g);
(d) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with electrically conductive material within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2, an 4.1.1.5;
(e) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. This requirement does not apply to devices which are intentionally active in transport activation. (radio frequency identification (RFID) transmitters, watches, sensors, etc) and which are not capable of generating a dangerous evolution of heat. When batteries are.installed in equipment. the equipment shall be packed in strong outer packagings constructed of suitable materials of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained,
(f) Each package shall be marked with the appropriate lithium battery mark, as illustrated in 5.2.1.9;

This requirement does not apply to:

(i) packages containing only button cell batteries installed in equipment (including circuit boards); and
(ii) packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment;

When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high.

NOTE: Packages containing lithium batteries packed in conformity with the provisions of Part 4, Chapter 11, packing instructions 965 or 968, Section IB of the ICAO Technical Instructions that bear the mark as shown in 5.2.1.9 (lithium battery mark) and the label shown in 5.2.2.2.2, model No. 9A shall be deemed to meet the provisions of this special provision.

(g) Except when cells or batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
(h) Except when cells or batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass. As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

As used above and elsewhere in this Code, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the transport of these batteries for specific modes of transport and to enable the application of different emergency response actions.

A single cell battery as defined in part III, subsection 38,3.2.3 of the Manual of Tests and Criteria is considered a "cell' and shall be transported according to the requirements for "cells" for the purpose of this special provision.

## Section 14. Transport Information continued.

IATA. International Air Transport Association.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** UN Proper Shipping Name/Description | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |

IMDG. International Maritime Dangerous Goods.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** UN proper shipping name | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |
| **14.7.** Transport in bulk – Maritime only. | Bulk transport is not applicable to this product |

IMDG Special Provision 188

Cells and batteries offered for transport are not subject to other provisions of this Code if they meet the following:

(a) For a lithium metal or lithium alloy cell. the lithium content is not more than 1 g, and for a lithium-ion cell, the watt-hour rating is not more than 20 Wh:
(b) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh. Lithium-ion batteries subject to this provision shall be marked with the watt-hour rating on the outside case, except those manufactured before 1 January 2009;
(c) Each cell or battery meets the provisions of 2.9.4.1, 2.9.4.5, 2.9.4.6 if applicable and 2.9.4.7;
(d) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with electrically conductive material within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2, an 4.1.1.5;
(e) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. This requirement does not apply to devices which are intentionally active in transport activation. (radio frequency identification (RFID) transmitters, watches, sensors, etc) and which are not capable of generating a dangerous evolution of heat. When batteries are installed in equipment. the equipment shall be packed in strong outer packagings constructed of suitable materials of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained,
(f) Each package shall be marked with the appropriate lithium battery mark, as illustrated in 5.2.1.10;

Note 1: The provisions concerning marking in special provision 188 of amendment 37-14 of the Code may continue to be applied until 31 December 2018.

Note 2: Packages containing lithium batteries packed in conformity with the provisions of part 4, chapter 11, packing instructions 965 or 968, Section IB of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air that bear the mark as shown in 5.2.1.10 (lithium battery mark) and the label shown in 5.2.2.2.2, Model No. 9A shall be deemed to meet the provisions of this special provision.

This requirement does not apply to:

.1 packages containing only button cell batteries installed in equipment (including circuit boards); and

.2 packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment;

When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high;

## Section 14. Transport Information continued.

IMDG. International Maritime Dangerous Goods continued.

(g) Except when cells or batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
(h) Except when cells or batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass. As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

As used above and elsewhere in this Code, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the transport of these batteries for specific modes of transport and to enable the application of different emergency response actions.

A single cell battery as defined in part III, subsection 38,3.2.3 of the Manual of Tests and Criteria is considered a "cell' and shall be transported according to the requirements for "cells" for the purpose of this special provision.

## Section 15. Regulatory Information.

**15.1.** Safety, health and environmental regulations/legislation specific for the substance or mixture
No data available.

**15.2.** Chemical safety assessment
No data available.

## Section 16. Additional Information.

Full text of Phrases and Statements used in Section 3;
H225 Highly flammable liquid and vapour.
H228 Flammable solid
H261 In contact with water releases flammable gases
H317 May cause an allergic skin reaction
H351 Suspected of causing cancer
H372 Causes damage to organs through prolonged or repeated exposure

The above information is believed to be accurate and represents the best information currently available.
No warranty is expressed or implied by the above information.
We assume no liability resulting from use of the above information.
The end user should conduct their own investigations to determine the suitability of the above information for their particular purpose.

## Section 1. Product and Company Identification.

**1.1 Model Number;** CP108VCOMBO8EU v1

**1.2 Description;** 5 x 10.8V SV10.8 Series Cordless Combo Kit - 2 Batteries
Battery: 10.8 Volts. 4 Ah. 400 grams.

**1.3 Manufacturer;**
Sealey Group.
Kempson Way,
Bury St. Edmunds,
Suffolk.
IP32 7AR

**1.4 Emergency telephone number;** 44 (0) 1284 757 500 (Office Hours)

**Date of source compilation;** 08/01/2020

## Section 2. Hazards Identification.

Battery is hermetically sealed and does not present a hazard under normal conditions of use.
Inappropriate handling and / or use can cause electrolyte to leak.

**Ingestion:** Contents of an open battery can cause chemical burns of mouth, oesophagus, and gastrointestinal tract.
**Inhalation:** Contents of an open battery can cause respiratory irritation.
**Skin Contact:** Contents of an open battery can cause skin irritation.
**Eye Contact:** Contents of an open battery can cause irritation.

## Section 3. Substances.

| **3.1 Chemical Name** (substance) | **3.1 CAS No.** | **3.2 Concentration Weight** | **Classification** | |
|---|---|---|---|---|
| | | | **Hazard Class & Category Code** | **Hazard Statements** [1] |
| Lithium nickel cobalt manganese oxide | 182442-95-1 | 25.5 – 30.0 % | - | - |
| Iron | 7439-89-6 | 17.0 – 21 % | - | - |
| Lithium hexafluorophosphate | 21324-40-3 | 14.4 – 18.5 % | - | - |
| Ethylene carbonate | 96-49-1 | | - | - |
| Dimethyl carbonate | 616-38-6 | | Flam. Liq. 2 | H225 |
| Methyl ethyl carbonate | 623-53-0 | | - | - |
| Diethyl carbonate | 105-58-8 | | - | - |
| Graphite powder | 7782-42-5 | 14.0 – 18.0 % | - | - |
| Copper foil | 7440-50-8 | 8.5 – 12.0 % | Aquatic Chronic 2 | H411 |
| Aluminium foil | 7429-90-5 | 3.2 – 5.9 % | Flam. Sol. 1<br>Water-react. 2 | H228<br>H261 |
| Polypropylene | 9003-07-0 | 2.8 – 4.0 % | - | - |
| Polyethylene terephthalate | 25038-59-9 | 1.1 – 1.4 % | - | - |
| Nickel | 7440-02-0 | 0.9 – 1.3 % | Carc. 2<br>STOT RE 1<br>Skin Sens. 1 | H351<br>H372<br>H317 |
| Polyvinylidene fluoride | 24937-79-9 | 0.45 – 0.8 % | - | - |
| Cellulose sodium, sodium salt of caboxy methyl cellulose | 9004-32-4 | 0.2 – 0.35 % | - | - |

[1]For full text of Statements, see Section 16.

## Section 4. First Aid Measures.

Lithium Batteries do not pose a risk to eyes or skin under normal circumstances.
In the case of contact with internal substances;

**4.1** Description of first aid measures

**Inhalation**

If breathing difficulties develop, remove the person to fresh air.
Loosen close fitting clothing.
Ensure that person is warm.
If mouth to mouth resuscitation is necessary, the person conducting this must takes steps to reduce the risk of contamination from toxic / corrosive substances that may be present.

**Skin Contact**

Remove contaminated clothing.
Flush affected area(s) with copious amounts of water for at least 15 minutes.
Get medical attention.

**Eye Contact**

Irrigate eyes with water for at least 15 minutes while raising eyelid(s).
Get medical attention.

**Ingestion**

If swallowed, do not induce vomiting. Give large amounts of water but *do not* do this if casualty is unconscious.

Protection of First Aiders:

Use personal protective equipment.
Avoid contact with skin, eyes and clothing.

**4.2.** Most important symptoms and effects, both acute and delayed

No data available.

**4.3.** Indication of any immediate medical attention and special treatment needed

No data available.

## Section 5. Fire Fighting Measures.

**Recommended practice;**
Always ensure that Personal Protection Equipment (PPE) is used.
If a battery becomes hot, immediately remove it from flammable materials and place on a non-combustible surface.
If possible, place a disintegrating device outdoors and allow it to burn out.
**Fire condition; NB; ensure that electrical devices are turned off. Prevent electric shock risk.**

If any batteries are burning, water may not extinguish them, but will cool the adjacent batteries and control the spread of fire.

**5.1.** Extinguishing media

**Extinguishers;**
Only use Graphite based $CO_2$ (Carbon dioxide), Dry Powder or Foam.
Copper powder fire extinguishers, sand, dry ground dolomite or soda ash may also be used. These materials act as smothering agents.

If possible, use a **LITH-X (powdered graphite)** extinguisher on small fires. This material acts as a smothering agent.
*A **sodium chloride powder** extinguisher **IS NOT** suitable for use on Lithium Batteries.*

It may not be possible to extinguish burning lithium batteries. Burning batteries will burn themselves out.
Do not use water with **LITH-X (powdered graphite)**.

- If a LITH-X (powdered graphite) extinguisher is not available;

Use copious amounts of water in a fine spray to swamp a fire.
Continue to use copious amounts of water until the fire is extinguished and the batteries are cooled.
NB: **Lithium reacts with water to form Hydrogen.** The fire will not be extinguished immediately.
Be aware of the increased risk of explosion.

NB; fire-fighting water runoff may be corrosive / toxic and may cause adverse environmental impact.

**5.2.** Special hazards arising from the substance or mixture

**Hazard characteristics;** thermal decomposition can lead to the release of toxic fumes.
**Hazardous combustion products;** carbon dioxide, carbon monoxide, lithium oxide fumes.

**5.3.** Advice for fire-fighters
Fragments may be ejected from a fire.
Fire Fighters should wear self-contained breathing apparatus and appropriate Personal Protective Equipment.

## Section 6. Accidental Release Measures.

**6.1.** Personal precautions, protective equipment and emergency procedures
In the event of battery rupture and leakage,

- ventilate the area.
- wear appropriate protective clothing (see Section 8) to prevent eye and skin contact and to prevent inhalation of vapours or fumes.
- remove sources of ignition.

**6.2.** Environmental precautions
No data available.

**6.3.** Methods and material for containment and cleaning up
Absorb released materials with inert absorbent (dry sand or soil).
Collect released materials into sealed plastic bag or container.
Prevent material from contaminating soil or entering sewers or waterways.
Do not dispose of released materials with domestic waste
Do not allow product to enter ground water, water course or sewerage system.
Dispose of released materials in accordance with local authority regulations.

**6.4.** Reference to other sections
See Section 7 for information on Safe Handling
See Section 8 for information of Personal Protective Equipment.
See Section 13 for information on disposal.

## Section 7. Handling and Storage.

**7.1.** Precautions for safe handling
Never dismantle or modify a battery.
Do not short circuit a battery. A short circuit causes heating and can lead to ignition of surrounding materials.
Physical contact with a short-circuited battery can cause skin burn.
When charging the battery, use dedicated chargers and follow the specified conditions.
Improperly charging a battery may cause the battery to combust.
Lithium batteries for transport by air in a state of charge must have no more than 30% charge of their rated capacity.

**7.2.** Conditions for safe storage, including any incompatibilities
Prevent contact with conductive materials.
Do not allow contact with water.
Store in original container. Keep container tightly closed.
Store in a dry, cool place.
Store at 20 °C (68°F); room temperature
Store away from ignition sources, heat, and incompatible materials.

**7.3.** Specific end use(s)
Intended for use as a battery, Model Number identified in 1.1 with Description stated in 1.2

## Section 8. Exposure Controls/Personal Protection.

**8.1.** Control parameters
In the event of battery rupture and leakage:
Ventilate the area.
Remove sources of ignition.

**8.2.** Exposure controls
The use of Personal Protective Equipment (PPE) is not necessary under conditions of normal use.
If handling a leaking or ruptured battery, ensure that the following Personal Protective Equipment (PPE) is used.

**Eye/Face Protection**
Chemical grade full face shield

**Skin Protection**
Acid resistant, natural rubber or neoprene gloves.
Protective rubber apron
Appropriate Personal Protection with long sleeves and long trousers.

**Respiratory Protection**
Acid gas filter mask or self-contained breathing apparatus.

## Section 9. Physical and Chemical Properties.

**9.1.** Information on basic physical and chemical properties

**The following information is not a technical specification or sales specification.**

| | |
|---|---|
| (a) Appearance: | Solid |
| (b) Odour: | Not relevant to battery as supplied. |
| (c) Odour threshold; | Not relevant to battery as supplied. |
| (d) pH: | No data available. |
| (e) Melting point/freezing point; | Not relevant. |
| (f) Initial boiling point and boiling range; | Not relevant. |
| (g) Flash point; | No data available. |
| (h) Evaporation rate; | Not relevant to battery as supplied. |
| (i) Flammability (solid, gas); | No data available. |
| (j) Upper/lower flammability or explosive limits; | No data available. |
| (k) Vapour pressure; | Not relevant. |
| (l) Vapour density; | Not relevant. |
| (m) Relative density; | Not relevant. |
| (n) Solubility(ies); | Battery insoluble in water. |
| (o) Partition coefficient: n-octanol/water; | Not relevant. |
| (p) Auto-ignition temperature; | No data available. |
| (q) Decomposition temperature; | No data available. |
| (r) Viscosity; | Not relevant. |
| (s) Explosive properties; | No data available. |
| (t) Oxidising properties. | No data available. |

**9.2** Other information — No data available.

## Section 10. Stability and Reactivity.

| | |
|---|---|
| **10.1.** Reactivity | No data available. |
| **10.2.** Chemical stability | Stable under normal conditions. |
| **10.3.** Possibility of hazardous reactions | No data available. |
| **10.4.** Conditions to avoid | Mechanical shock.<br>Vibrations during transport are not detrimental to condition.<br>Do not dismantle, crush or install with incorrect polarity.<br>Prevent mechanical / electrical misuse. |
| **10.5.** Incompatible materials | Prevent exposure to heat, open flame and corrosives. |
| **10.6.** Hazardous decomposition products | Leaking battery will release electrolyte. |

## Section 11. Toxicological Information.

**11.1.** Information on toxicological effects

**Potential health risks;**

**Eye**; Contact with battery contents may cause severe irritation and burns. Eye damage is possible.
**Skin**; Contact with battery contents may cause severe irritation and burns.
Absorption through the skin will cause localized inflammation.
**Ingestion**; may cause severe and permanent damage to the digestive tract. May cause circulatory system failure.
Contents of an open battery can cause serious chemical burns to the mouth, oesophagus and gastrointestinal tract.
**Inhalation;** Inhalation of vapours or fumes released due to heat or leaking batteries may cause respiratory irritation.
Irritation may lead to chemical pneumonitis.
Inhalation can produce chronic productive cough and shortness of breath.

## Section 12. Ecological Information.

When properly used and disposed of correctly, the battery does not present environmental hazard.
Do not release internal components into water ways, wastewater or ground water.

## Section 13. Disposal Considerations.

Disposal of the battery must be in accordance with local authority regulation requirements for hazardous waste treatment and hazardous waste transportation.
The battery should be completely discharged prior to disposal and the terminals taped or capped to prevent short circuit.
Do not dispose of batteries at landfill sites.
Do not incinerate batteries.

## Section 14. Transport Information.

ADR. International Carriage of Dangerous Goods by Road.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** Name and Description | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |

ADR Special Provision 188

Cells and batteries offered for transport are not subject to other provisions of this Code if they meet the following:

(i) For a lithium metal or lithium alloy cell. the lithium content is not more than 1 g, and for a lithium-ion cell, the watt-hour rating is not more than 20 Wh:
(j) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 9, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh. Lithium-ion batteries subject to this provision shall be marked with the watt-hour rating on the outside case, except those manufactured before 1 January 2009;
(k) Each cell or battery meets the provisions of 2.2.9.1.7*(a),(e),(f) if applicable and (g);
(l) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with electrically conductive material within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2, an 4.1.1.5;
(m) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. This requirement does not apply to devices which are intentionally active in transport activation. (radio frequency identification (RFID) transmitters, watches, sensors, etc) and which are not capable of generating a dangerous evolution of heat. When batteries are.installed in equipment. the equipment shall be packed in strong outer packagings constructed of suitable materials of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained,
(n) Each package shall be marked with the appropriate lithium battery mark, as illustrated in 5.2.1.9;

This requirement does not apply to:

(iii) packages containing only button cell batteries installed in equipment (including circuit boards); and
(iv) packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment;

When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high.

NOTE: Packages containing lithium batteries packed in conformity with the provisions of Part 4, Chapter 11, packing instructions 965 or 968, Section IB of the ICAO Technical Instructions that bear the mark as shown in 5.2.1.9 (lithium battery mark) and the label shown in 5.2.2.2.2, model No. 9A shall be deemed to meet the provisions of this special provision.

(o) Except when cells or batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
(p) Except when cells or batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass. As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

As used above and elsewhere in this Code, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the transport of these batteries for specific modes of transport and to enable the application of different emergency response actions.

A single cell battery as defined in part III, subsection 38,3.2.3 of the Manual of Tests and Criteria is considered a "cell' and shall be transported according to the requirements for "cells" for the purpose of this special provision.

## Section 14. Transport Information continued.

IATA. International Air Transport Association.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** UN Proper Shipping Name/Description | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |

IMDG. International Maritime Dangerous Goods.

| | |
|---|---|
| **14.1.** UN number | UN 3481 |
| **14.2.** UN proper shipping name | Lithium ion batteries packed with equipment |
| **14.3.** Transport hazard class(es) | 9 |
| **14.4.** Packing group | - |
| **14.5.** Environmental hazards | Does not present an environmental hazard. |
| **14.6.** Special precautions for user | No special precautions necessary. |
| **14.7.** Transport in bulk – Maritime only. | Bulk transport is not applicable to this product |

IMDG Special Provision 188

Cells and batteries offered for transport are not subject to other provisions of this Code if they meet the following:

(i) For a lithium metal or lithium alloy cell. the lithium content is not more than 1 g, and for a lithium-ion cell, the watt-hour rating is not more than 20 Wh:
(j) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh. Lithium-ion batteries subject to this provision shall be marked with the watt-hour rating on the outside case, except those manufactured before 1 January 2009;
(k) Each cell or battery meets the provisions of 2.9.4.1, 2.9.4.5, 2.9.4.6 if applicable and 2.9.4.7;
(l) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with electrically conductive material within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2, an 4.1.1.5;
(m) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. This requirement does not apply to devices which are intentionally active in transport activation. (radio frequency identification (RFID) transmitters, watches, sensors, etc) and which are not capable of generating a dangerous evolution of heat. When batteries are installed in equipment. the equipment shall be packed in strong outer packagings constructed of suitable materials of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained,
(n) Each package shall be marked with the appropriate lithium battery mark, as illustrated in 5.2.1.10;

Note 1: The provisions concerning marking in special provision 188 of amendment 37-14 of the Code may continue to be applied until 31 December 2018.

Note 2: Packages containing lithium batteries packed in conformity with the provisions of part 4, chapter 11, packing instructions 965 or 968, Section IB of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air that bear the mark as shown in 5.2.1.10 (lithium battery mark) and the label shown in 5.2.2.2.2, Model No. 9A shall be deemed to meet the provisions of this special provision.

This requirement does not apply to:

.1 packages containing only button cell batteries installed in equipment (including circuit boards); and

.2 packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment;

When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high;

## Section 14. Transport Information continued.

IMDG. International Maritime Dangerous Goods continued.

(o) Except when cells or batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
(p) Except when cells or batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass. As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.

As used above and elsewhere in this Code, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the transport of these batteries for specific modes of transport and to enable the application of different emergency response actions.

A single cell battery as defined in part III, subsection 38,3.2.3 of the Manual of Tests and Criteria is considered a "cell' and shall be transported according to the requirements for "cells" for the purpose of this special provision.

## Section 15. Regulatory Information.

**15.1.** Safety, health and environmental regulations/legislation specific for the substance or mixture
No data available.

**15.2.** Chemical safety assessment
No data available.

## Section 16. Additional Information.

Full text of Phrases and Statements used in Section 3;
H225 Highly flammable liquid and vapour.
H228 Flammable solid.
H261 In contact with water releases flammable gases.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

The above information is believed to be accurate and represents the best information currently available.
No warranty is expressed or implied by the above information.
We assume no liability resulting from use of the above information.
The end user should conduct their own investigations to determine the suitability of the above information for their particular purpose.

| Issue level | Date | Revisions |
|---|---|---|
| 1 | 15/11/23 | First issue. |
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End of Safety Data Sheet.