

## Article Safety Data Sheet - Lithium Metal Batteries

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### **This Article Safety Data Sheet is provided as a service to our customers.**

Based on the definition of the term 'article' in the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200, there is no requirement for a Material Safety Data Sheet (MSDS) for lithium primary coin cells. Notification is not required because these products are 'articles' that do not release a covered toxic chemical under the normal conditions of processing or use.

### **Disclaimer:**

**The batteries are exempt articles and are not subject to hazard Communication Standard Requirement. This sheet is provided as technical information only. The information contained in this Product Safety Data Sheet has been established to the best of RENATA SA's knowledge and belief. RENATA SA makes no representation and provides no warranty or guarantee regarding the contents of this Product Safety Data Sheet and excludes its liability, express or implied.**

## Section 1 - Product identification

### 1.1 Product identifier

Product Name: **Primary (non-rechargeable) Lithium Battery** Nominal Voltage: 3.0 V

Models: **Coin Type Cells CR Series see Annex I**

Chemical System: **Lithium Manganese Dioxide** ( $\text{Li} + \text{MnO}_2 \rightarrow \text{LiMnO}_2$ )  
Primary **NOT** designated for Recharge

### 1.2 Recommended use and restrictions on use

Recommended use: battery, no restrictions, see section 7 handling and storage.

### 1.3 Suppliers details

RENATA SA  
Kreuzenstrasse 30  
CH-4452 ITINGEN / Switzerland  
Tel: +41 61 975 75 75  
Fax: +41 61 975 75 95  
Mail: sales@renata.com

### 1.4 Emergency phone number

For US call The National Poison Control Center (1-800-222-1222) day or night – for advice and follow-up.

**Swallowed a Button Battery? Battery in the Nose or Ear?: National Capital Poison Center**

**Call 1-202-625-3333 for guidance.**

For other countries please contact the local Tox Centers

(EU: [http://ec.europa.eu/growth/sectors/chemicals/poison-centres/index\\_en.htm](http://ec.europa.eu/growth/sectors/chemicals/poison-centres/index_en.htm)).

## Section 2 - Hazard Identification

### 2.1 Classification of the substance or mixture

#### Classification according to UN-GHS

Batteries are considered as articles and are as such exempted from the UN-GHS classification requirements. The classification based on the hazardous substances contained in the product (electrode materials and liquid electrolyte contained in the batteries) is provided below for information purposes only.



Eye Dam. 1	H318: Causes serious eye damage
Skin Irrit. 2	H315: Causes skin irritation
Acute Tox. 4	H302: Harmful if swallowed
Acute Tox. 4	H332: Harmful if inhaled
STOT RE 2	H373: May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation)
Repr. 1B	H360 FD: May damage fertility. May damage the unborn child.
Water-react. 1	H260: In contact with water releases flammable gases which may ignite spontaneously

## 2.2 GHS Label elements, including precautionary statements

The UN GHS labeling information is not provided in this section as batteries are articles and therefore are exempted from the UN GHS labeling requirements. Other labeling requirements apply for batteries according to EU Directive 2006/66/EC.

Nevertheless the following warning must be observed:  
Keep out of reach of children.

## 2.3 Other hazards which do not result in classification

The chemicals mentioned in Section 3 are contained in a sealed can.

Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety precautions in Section VII). Swallowing of a battery can lead to chemical burns, perforation of soft tissues and death. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately.

## Section 3 - Composition / Information on Ingredients

### 3.1 Substances

Not applicable

### 3.2 Mixtures

**IMPORTANT NOTE:** The battery should not be opened or exposed to heat because exposure of the following ingredients contained within could be harmful under some circumstances.

Hazardous substances contained in the product according to UN-GHS:

Chemical Name	CAS No.	Content % of total weight	Hazard class and category	Hazard statement
Manganese Dioxide (MnO <sub>2</sub> )	1313-13-9	12 - 50	Acute Tox. 4, Acute Tox. 4, STOT RE 2	H302, H332, H373 (Brain) (Inhalation)
Lithium*	7439-93-2	1.1 - 3.3	Water-react. 1 Skin Corr. 1B	H260, H314
Propylene Carbonate (PC)	108-32-7	2 - 9	Eye Irrit. 2	H319
1,2 dimethoxy ethane (DME)**	110-71-4	1 - 3.5	Flam Liq. 2, Acute Tox. 4, Repr. 1B	H225, H332, H360FD
Lithium Perchlorate (LiClO <sub>4</sub> )	7791-03-9	0.2 – 0.8	Ox. Sol. 2, Skin. Irrit. 2, Eye Irrit. 2, STOT SE 3	H272, H315, H319, H335

\* Approximate weight content of lithium in each model can be found in Annex I

\*\* DME (CAS 110-71-4) is listed in the European candidate list as a SVHC (Reason for inclusion: Toxic for reproduction - REACH Regulation 1907/2006/EC, Article 57c)

## Section 4 - First Aid Measures

**None** unless internal material exposure.

### 4.1 Description of necessary first aid measures

Skin contact:

Skin contact with contents of an opened battery causes irritation, flush immediately with copious amounts of water. Remove contaminated clothing. If irritation persists, get medical help.

Eye contact:

Contents of an opened battery causes serious eye damage, flush immediately thoroughly with copious amounts of water for at least 15 minutes. Get medical attention immediately.

Ingestion:

Seek medical attention immediately.

Inhalation:

Do not inhale leaked material. Provide immediately fresh air, if irritation persists, get medical help.

### 4.2 Most important symptoms / effects, acute and delayed

The chemicals mentioned in Section 3 are contained in a sealed can.

Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety precautions in Section VII). Swallowing of a battery can lead to chemical burns, perforation of soft tissues and death. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately. See 1.4 Emergency phone number.

In case of exposure to inner component/material of the battery:

Harmful if swallowed (Manganese Dioxide)

Harmful if inhaled (Manganese Dioxide, DME)

May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation) (Manganese Dioxide)

May damage fertility. May damage the unborn child. (DME)

### 4.3 Indication of immediate medical attention and special treatment needed

No further information available.

## Section 5 - Fire Fighting Measures

### 5.1 Suitable extinguishing media

In case of fire in an adjacent area, use water. CO<sub>2</sub> or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products. For bulk quantities of unpackaged cells use for example LITH-X (Graphite Base). In this case, do not use water.

In a small room, remember that the supply of oxygen is quickly consumed in feeding a lithium fire.

### 5.2 Specific hazards arising from the chemical

When exposed to heat, the battery may rupture and release hazardous substances.

Burning lithium manganese dioxide batteries produce toxic and corrosive lithium hydroxide fumes.

Lithium metal reacts with water and forms flammable hydrogen gas.

### 5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products. Wear protective clothing and equipment.





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## Section 9 - Physical and Chemical Properties

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### 9.1 Basic physical and chemical properties

<b>Physical state:</b>	Solid
<b>Colour:</b>	according to product specifications
<b>Odour:</b>	Not applicable
<b>Melting point / Freezing point:</b>	Not applicable
<b>Boiling point/Boiling range:</b>	Not applicable
<b>Flammability:</b>	Not determined
<b>Lower and upper explosion limits / Flammability limit:</b>	Not determined
<b>Flash point:</b>	Flash point of electrolyte solvents (°C): DME: -6°C, PC: 123°C, <b>Mixture: 20°C</b>
<b>Auto-ignition temperature:</b>	Not applicable
<b>Decomposition temperature:</b>	No decomposition under normal conditions of use
<b>pH:</b>	Not applicable
<b>Kinematic viscosity:</b>	Not applicable
<b>Solubility:</b>	Not applicable
<b>Partition coefficient (n-octanol/water) log value:</b>	Not applicable
<b>Vapour pressure:</b>	Not applicable
<b>Density or relative density:</b>	Not applicable
<b>Relative vapour density:</b>	Not applicable
<b>Particle characteristics:</b>	Not applicable

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## Section 10 - Stability and Reactivity

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Lithium batteries are contained in a stable steel container and are sealed to avoid any chemical release under conditions of normal use.

### 10.1 Reactivity

No reactions if article is used according to specifications.

### 10.2 Chemical stability

No decomposition if article is used according to specifications.

### 10.3 Possibility of hazardous reactions

No dangerous reactions if article is used according to specifications.

### 10.4 Conditions to avoid

See section 7

### 10.5 Incompatible materials

See section 7

### 10.6 Hazardous decomposition products

No further information available

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**Section 11 - Toxicological Information**

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**11.1 Information on toxicological effects**

The chemicals mentioned in Section 3 are contained in a sealed can.

Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see safety precautions in section 7).

Classification based on the hazardous substances contained in the product (electrode materials and electrolyte solution contained in the batteries):

**Acute toxicity**

Harmful if swallowed (Manganese Dioxide)

Harmful if inhaled (Manganese Dioxide, DME)

**Skin corrosion/irritation**

Causes skin irritation (Lithium)

**Serious eye damage/irritation**

Causes serious eye damage (Lithium)

**Respiratory or skin sensitization**

Based on classification of ingredients, the classification criteria are not met.

**Germ cell mutagenicity**

Based on classification of ingredients, the classification criteria are not met.

**Carcinogenicity**

Based on classification of ingredients, the classification criteria are not met.

**Reproductive toxicity**

May damage fertility. May damage the unborn child. (DME)

**STOT-single exposure**

Based on classification of ingredients, the classification criteria are not met.

**STOT-repeated exposure**

May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation) (Manganese Dioxide)

**Aspiration hazard**

Based on classification of ingredients, the classification criteria are not met.

**11.2 Information on the likely routes of exposure**

The chemicals mentioned in Section 3 are contained in a sealed can.

Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (exposure via ingestion, skin or eye contact or inhalation). The most likely risk is acute exposure when a cell vents.

**11.3 Symptoms related to the physical, chemical and toxicological characteristics**

No further information available.

**11.4 Delayed and immediate effects and also chronic effects from short and long term exposure**

The chemicals mentioned in Section 3 are contained in a sealed can.

Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety precautions in Section VII). Swallowing of a battery can lead to chemical burns, perforation of soft tissues and death. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately.

**11.5 Numerical measures of toxicity**

No further information available.

**11.6 Interactive effects**

No further information available.

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**Section 12 - Ecological Information**

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The chemicals mentioned in Section 3 are contained in a sealed battery can.  
Under conditions of normal use, the chemicals will not be released.

**12.1 Toxicity**

Aquatic toxicity: Based on classification of ingredients, the classification criteria are not met.

**12.2 Persistence and degradability**

Not biodegradable.

**12.3 Bioaccumulative potential**

No further information available.

**12.4 Mobility in soil**

No further information available.

**12.5 Other adverse effects**

No further information available.

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**Section 13 - Disposal Considerations**

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**13.1 Disposal methods****a) Be sure to comply with your federal, state and local regulation disposal of used batteries.**

Dispose in accordance with appropriate national and international regulations, below some references.

European Community: according to Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), Annex VII, batteries have to be removed from any separately collected WEEE. The removed batteries have to be treated according to the Battery directive 2006/66/EC  
European Waste Catalogue: 16 06 05 other batteries and accumulators

US: Lithium batteries are neither specifically listed nor exempted from the Federal Environmental Protection Agency (US EPA) hazardous waste regulations. The only material of possible concern due to its reactivity is lithium metal. However, button cells contain so little lithium that they can be disposed of in the normal municipal waste stream.

**Use a professional disposal firm for disposal of mass quantities of undischarged lithium batteries.**

**b) Open cells should be treated as hazardous waste**

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F (100°C). Such treatment can cause cell rupture.



**Section 14 - Transportation Information**

Lithium metal batteries are classified as Class 9 Dangerous Goods in the United Nations Recommendation. In case of transport, compliance with all the relevant UN regulations is required. Our battery and its shipping package complies with the requirement of UN Manual of Test and Criteria, (see below section 2.).

**Provisions for the international transportation (pursuant to ICAO-TI/IATA-DGR, IMDG Code, ADR, RID, DOT):**

UN-No. UN 3090  
 Proper Shipping Name: Lithium metal batteries

Lithium metal cells and batteries are subject to the following transport rules:

Method	Technical Guidelines	Packing Instructions and Special Provisions
Air	ICAO TI 2017-2018) or IATA Dangerous Goods Regulations 2017 (58th Edition)	<b>Packing Instruction 968, Section II</b> Only applies for shipments, were the total net weight of the batteries does <u>not</u> exceed 2.5 kg and the shipment does <u>not</u> exceed one package (handling unit)  <b>Packing Instruction 968, Section IB</b> applies for shipments, were the total net weight of the batteries does exceed 2.5 kg
Road and Rail Europe	ADR / RID 2017	Special Provision 188
Marine	IMDG Code 2015 (amdt 37)	Special Provision 188
USA	DOT 49 CFR	49 CFR Sections 171.12, 171.24, 171.25

**All Renata CR Lithium Metal (button) cells and batteries fulfil the conditions pursuant to the requirements for partly regulated transportation of the relevant Rules and Regulations according to the above mentioned technical Guidelines.**

Summary of Air Transport Packing Instructions and Special Provisions (IATA Dangerous Goods Regulations 58th Edition):

- For all the lithium metal (button) cells, listed in Annex I the lithium content is not more than 0.3 g and for lithium metal batteries the lithium content is not more than 0.3 g.
- Each cell or battery of the type proven meet the requirements of each test in the UN Manual of *Tests and Criteria*, Part III, subsection 38.3 (Edition 5) - (DGR 3.9.2.6).
- Packing, marking, labelling and weight limitations must be observed as per technical guidelines of the respective transport mode.
- For shipments by Airfreight under Section IB, a dangerous goods declaration (DGD) will align the shipment as per IATA dangerous goods regulations. For shipments by Airfreight under Section II, only a caution statement will align the shipment, see Annex III.

**Note I: Lithium metal (button) cells and batteries are forbidden for transportation aboard passenger-carrying aircraft.**

Note II: Example of Lithium Metal Battery Label see Annex II  
 Examples of Lithium Metal Battery transport accompanied Document (Caution Statement) see Annex III  
 Example of Cargo Aircraft Only Label see Annex IV  
 Example of Dangerous Goods Class 9 Label (for airfreight use, only) see Annex V  
 For information 49 CFR 171.12 / 171.24 / 171.25 see Annex VI

## GENERAL HANDLING INSTRUCTIONS

Battery cartons should be handled with care. Rough handling may result in batteries being short circuited or damaged. This may cause leakage, explosion, or fire. (Refer also to Section VII)

## GENERAL REMARK

The exemptions from dangerous goods regulations are only applicable with the respect to the delivery form / packaging in which the lithium batteries are dispatched by RENATA SA. Any re-packing or assembly of the cells and batteries is in the responsibility of the customer and makes new safety tests necessary.

## Section 15 - Regulatory Information

Environment-related law of batteries: EU nations have applicable law in accordance with Directive 2006/66/EC and other some countries, China, Korea, Brazil, some provinces of USA and Canada or so have similar law.

### REACH regulation (1907/2006/EC)

#### Duty to communicate information on substances in articles (REACH, Article 33):

The product contains the following substance of very high concern (SVHC) in concentrations above 0.1 % w/w : DME (CAS 110-71-4): reason for inclusion in the European candidate list - Toxic for reproduction (REACH, Article 57c).

## Section 16 - Other Information

RENATA's lithium batteries are registered by UNDERWRITERS LABORATORIES INC., NORTHBROOK, IL, U.S.A., under file number MH14002.

Further information is given in RENATA Designer's Guide.

For lithium cells and batteries in general, Safety Standard IEC 60086-4 applies, which also contains detailed recommendations for manufacturers of equipment and users.

For further information on RENATA's lithium cells and batteries visit our web site: [www.renata.com](http://www.renata.com).

## Abbreviations

Acute Tox. 4: Acute toxicity, Hazard Category 4  
 Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1  
 Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2  
 Flam Liq. 2: Flammable liquids, Hazard Category 2  
 Ox. Sol. 2: Oxidising Solids, Hazard Category 2  
 Repr. 1B: Reproductive toxicity, Hazard Category 1B  
 Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2  
 STOT RE 2 Specific target organ toxicity — Repeated exposure, Hazard Category 2  
 STOT SE 3 Specific target organ toxicity — Single exposure, Hazard Category 3  
 Water-react. 1: Water-reactive, Hazard Category 1  
 H225: Highly flammable liquid and vapour  
 H260: In contact with water releases flammable gases which may ignite spontaneously  
 H272: May intensify fire; oxidiser  
 H302: Harmful if swallowed  
 H314: Causes severe skin burns and eye damage  
 H315: Causes skin irritation  
 H318: Causes serious eye damage  
 H319: Causes serious eye irritation

H332: Harmful if inhaled

H335: May cause respiratory irritation

H373 May cause damage to organs (...) through prolonged or repeated exposure (...)

H360 FD May damage fertility. May damage the unborn child.

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS: Chemical Abstracts Service (division of the American Chemical Society)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

IATA: International Air Transport Association

IMDG: International Maritime Code for Dangerous Goods

SVHC: substance of very high concern

**ANNEX I**

**APPROXIMATE WEIGHT CONTENT OF LITHIUM IN RENATA LITHIUM BATTERIES**

Model no.	% Lithium Max	Weight of battery (in g)	Qty Li (Max in mg)
CR1025	1.5 %	0.6	9
CR1216	1.1 %	0.7	8
CR1216 MFR	1.3 %	0.7	9
CR1220	1.4 %	0.8	11
CR1220 MFR	1.6 %	0.8	13
CR1225	1.7 %	0.9	15
CR1616	1.3 %	1.1	15
CR1620	1.8 %	1.2	21
CR1632	2.2 %	1.8	39
CR1632 MFR	2.2 %	1.8	39.5
CR2016	1.4 %	1.7	24
CR2016 MFR	1.5 %	1.7	26
CR2016.MFR	1.3 %	1.8	23
CR2025	2.1 %	2.3	48
CR2025 MFR	2.0 %	2.5	50
CR2025.MFR	1.9 %	2.5	48
CR2032	2.4 %	2.8	67
CR2032 MFR	2.0 %	2.8	56
CR2032.MFR	2.2 %	2.9	65
CR2045	2.2 %	4.0	83
CR2320	1.6 %	2.7	43
CR2325	1.8 %	3.0	55
CR2430	2.0 %	4.1	80
CR2430 MFR	3.0 %	4.3	129
CR2450HT	2.2 %	6.7	149
CR2450N	2.7 %	5.9	160
CR2450N.MFR	2.6 %	6.2	162
CR2450N-MFR	2.6 %	6.0	156
CR2477N	3.3 %	8.3	270
Power Modules	% Lithium Max	Weight of battery (in g)	Qty Li (Max in mg)
338A	1.7 %	1.7	15
175-0 / 175-2 175-0B	2.2 %	6.5	65
1000-0 / 1000-1 1000-1B /1000-0B	3.3 %	15	270

Power Modules (Non self-running device)

The encapsulated battery is hermetically sealed and therefore suitable for applications in harsh environmental conditions

**ANNEX II**



or



For further Information's consult the IATA Dangerous Goods Regulations, 58th Edition (Section 7.4.8).

ANNEX III

# CAUTION!

Packages in this shipment contain

## Lithium Metal Batteries

**UN-No. UN 3090**  
**Proper Shipping Name: Lithium metal batteries**

Lithium metal (button) cells and batteries are subject to the following transport rules:

Method	Technical Guidelines	Packing Instructions and Special Provisions
Air	ICAO TI 2017-2018) or IATA Dangerous Goods Regulations 2017 (58th Edition)	<p><b>Packing Instruction 968, Section II</b>                      Only applies for shipments, were the total net weight of the batteries does <u>not</u> exceed 2.5 kg and the shipment does <u>not</u> exceed one package (handling unit)</p> <p><b>Packing Instruction 968, Section IB</b>                      applies for shipments, were the total net weight of the batteries does exceed 2.5 kg and the shipment does not exceed one package</p>
Road and Rail Europe	ADR / RID 2017	Special Provision 188
Marine	IMDG Code 2015 (amdt 37)	Special Provision 188
USA	DOT 49 CFR	49 FR Sections 171.12, 171.24, 171.25

**Hereby we confirm that our shipment containing Lithium Metal (button) cells and batteries fully complies with all mentioned requirements of the relevant Rules and Regulations of the above mentioned technical Guidelines.**

The packages must be handled with care.  
 A flammability hazard exists if the packages are damaged.

Special procedures must be followed in the event the packages are damaged, including inspection and repacking if necessary.

If the packages are damaged, batteries must be quarantined, inspected and repacked.

**Emergency 24-hour Telephone Number for all Airfreight shipments packed under Packing Instruction 968, Section IB:**

**Phone: +41 61 319 28 27 or +41 61 975 74 74**

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The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. RENATA S.A. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

**ANNEX IV**

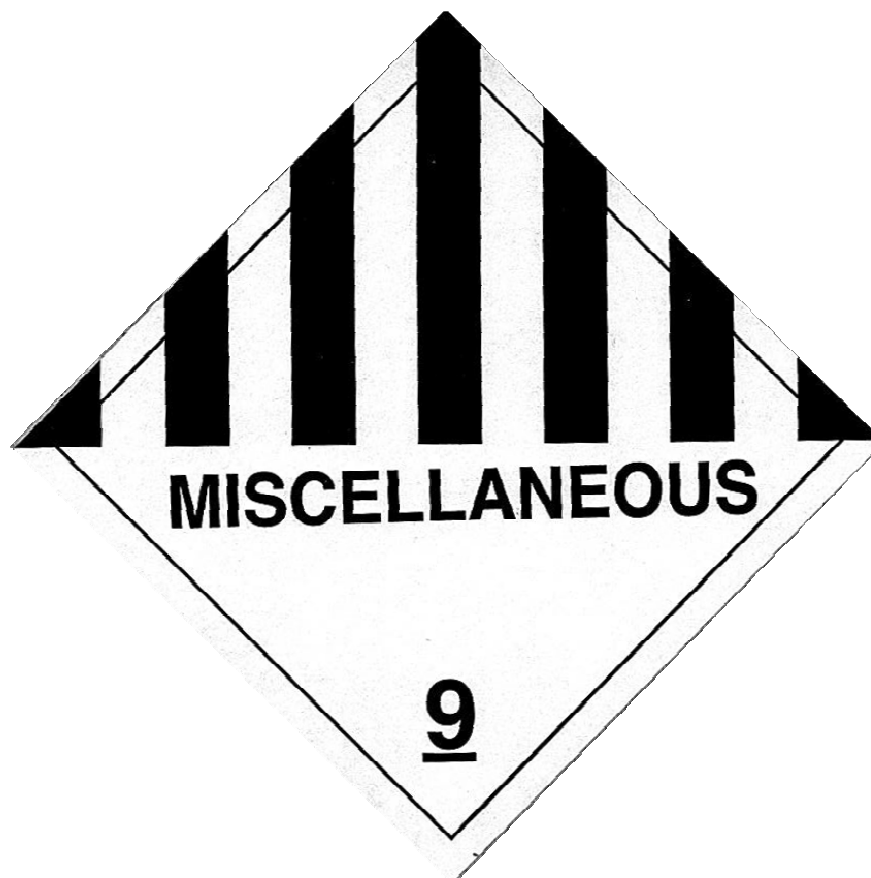


For further Information's consult the IATA Dangerous Goods Regulations, 58th Edition (Section 7.4.2).

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**ANNEX V**

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For further Information's consult the IATA Dangerous Goods Regulations, 58th Edition (Section 7.3.18 – Figure 7.3.W).





(b) *Shipments to or from Mexico.* Unless otherwise excepted, hazardous materials shipments from Mexico to the United States or from the United States to Mexico must conform to all applicable requirements of this subchapter. When a hazardous material that is a material poisonous by inhalation (see §171.8) is transported by highway or rail from Mexico to the United States, or from the United States to Mexico, the following requirements apply:

- (1) The shipping description must include the words "Toxic Inhalation Hazard" or "Poison-Inhalation Hazard" or "Inhalation Hazard", as required in §172.203(m) of this subchapter.
- (2) The material must be packaged in accordance with requirements of this subchapter.
- (3) The package must be marked in accordance with §172.313 of this subchapter.
- (4) Except as provided in paragraph (e)(5) of this section, the package must be labeled or placarded POISON GAS or POISON INHALATION HAZARD, as appropriate, in accordance with subparts E and F of this subchapter.
- (5) A label or placard that conforms to the UN Recommendations (IBR, see §171.7) specifications for a "Division 2.3" or "Division 6.1" label or placard may be substituted for the POISON GAS or POISON INHALATION HAZARD label or placard required by §§172.400(a) and 172.504(e) of this subchapter on a package transported in a closed transport vehicle or freight container. The transport vehicle or freight container must be marked with identification numbers for the material, regardless of the total quantity contained in the transport vehicle or freight container, in the manner specified in §172.313(c) of this subchapter and placarded as required by subpart F of this subchapter.

## § 171.24 Additional requirements for the use of the ICAO Technical Instructions.

(a) A hazardous material that is offered for transportation or transported within the United States by aircraft, and by motor vehicle or rail either before or after being transported by aircraft in accordance with the ICAO Technical Instructions (IBR, see §171.7), as authorized in paragraph (a) of §171.22, must conform to the requirements in §171.22, as applicable, and this section.

(b) Any person who offers for transportation or transports a hazardous material in accordance with the ICAO Technical Instructions must comply with the following additional conditions and requirements:

- (1) All applicable requirements in parts 171 and 175 of this subchapter (also see 14 CFR 121.135, 121.401, 121.433a, 135.323, 135.327 and 135.333);
- (2) The quantity limits prescribed in the ICAO Technical Instructions for transportation by passenger-carrying or cargo aircraft, as applicable;
- (3) The conditions or requirements of a United States variation, when specified in the ICAO Technical Instructions.

(c) *Highway transportation.* For transportation by highway prior to or after transportation by aircraft, a shipment must conform to the applicable requirements of part 177 of this subchapter, and the motor vehicle must be placarded in accordance with subpart F of part 172.

(d) *Conditions and requirements specific to certain materials.* Hazardous materials offered for transportation or transported in accordance with the ICAO Technical Instructions must conform to the following specific conditions and requirements, as applicable:

(1) *Batteries (i) Nonspillable wet electric storage batteries.* Nonspillable wet electric storage batteries are not subject to the requirements of this subchapter provided

- (A) The battery meets the conditions specified in Special Provision 67 of the ICAO Technical Instructions;
- (B) The battery, its outer packaging, and any overpack are plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY"; and

**(C) The batteries or battery assemblies are offered for transportation or transported in a manner that prevents short circuiting or forced discharge, including, but not limited to, protection of exposed terminals.**

(ii) *Primary lithium batteries and cells.* Primary lithium batteries and cells are forbidden for transportation aboard passenger-carrying aircraft. Equipment containing or packed with primary lithium batteries or cells are forbidden for transport aboard passenger-carrying aircraft except as provided in §172.102, Special Provision A101 of this subchapter. When transported aboard cargo-only aircraft, packages containing primary lithium batteries and cells transported in accordance with Packing Instructions 968-970 (Section II) of the ICAO Technical Instructions must be marked "PRIMARY LITHIUM BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT" or "LITHIUM METAL BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT." This marking is not required on packages that contain 5 kg (11 pounds) net weight or less of primary lithium batteries or cells that are contained in or packed with equipment.

(iii) *Prototype lithium batteries and cells.* Prototype lithium batteries and cells are forbidden for transport aboard passenger aircraft and must be approved by the Associate Administrator prior to transportation aboard cargo aircraft, in accordance with the requirements of Special Provision A55 in §172.102 of this subchapter.

(2) A package containing Oxygen, compressed, or any of the following oxidizing gases must be packaged as required by Parts 173 and 178 of this subchapter: carbon dioxide and oxygen mixtures, compressed; compressed gas, oxidizing, n.o.s.; liquefied gas, oxidizing, n.o.s.; nitrogen trifluoride; and nitrous oxide.

## § 171.25 Additional requirements for the use of the IMDG Code.

(a) A hazardous material may be offered for transportation or transported to, from or within the United States by vessel, and by motor carrier and rail in accordance with the IMDG Code (IBR, see §171.7), as authorized in §171.22, provided all or part of the movement is by vessel. Such shipments must conform to the requirements in §171.22, as applicable, and this section.

(b) Any person who offers for transportation or transports a hazardous material in accordance with the IMDG Code must conform to the following additional conditions and requirements:

(1) Unless specified otherwise in this subchapter, a shipment must conform to the requirements in part 176 of this subchapter. For transportation by rail or highway prior to or subsequent to transportation by vessel, a shipment must conform to the applicable requirements of parts 174 and 177 respectively, of this subchapter, and the motor vehicle or rail car must be placarded in accordance with subpart F of part 172 of this subchapter. When a hazardous material regulated by this subchapter for transportation by highway is transported by motor vehicle on a public highway or by rail under the provisions of subpart C of part 171, the segregation requirements of Part 7, Chapter 7.2 of the IMDG Code are authorized.

(2) For transportation by vessel, the stowage and segregation requirements in Part 7 of the IMDG Code may be substituted for the stowage and segregation requirements in part 176 of this subchapter.

**(3) Packages containing primary lithium batteries and cells that are transported in accordance with Special Provision 188 of the IMDG Code must be marked "PRIMARY LITHIUM BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT" or "LITHIUM METAL BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT." This marking is not required on packages that contain 5 kg (11 pounds) net weight or less of primary lithium batteries and cells that are contained in or packed with equipment.**

(4) Material consigned under UN3166 and UN3171 ( e.g., Engines, internal combustion, etc., Vehicles, etc. and Battery-powered equipment) may be prepared in accordance with the IMDG Code or this subchapter.

(c) *Conditions and requirements for bulk packagings.* Except for IBCs and UN portable tanks used for the transportation of liquids or solids, bulk packagings must conform to the requirements of this subchapter. Additionally, the following requirements apply:

(1) UN portable tanks must conform to the requirements in Special Provisions TP37, TP38, TP44 and TP45 when applicable, and any applicable bulk special provisions assigned to the hazardous material in the Hazardous Materials Table in §172.101 of this subchapter;

(2) IMO Type 5 portable tanks must conform to DOT Specification 51 or UN portable tank requirements, unless specifically authorized in this subchapter or approved by the Associate Administrator;

(3) Except as specified in this subpart, for a material poisonous (toxic) by inhalation, the T Codes specified in Column 13 of the Dangerous Goods List in the IMDG Code may be applied to the transportation of those materials in IM, IMO and DOT Specification 51 portable tanks, when these portable tanks are authorized in accordance with the requirements of this subchapter; and

(4) No person may offer an IM or UN portable tank containing liquid hazardous materials of Class 3, PG I or II, or PG III with a flash point less than 100 °F (38 °C); Division 5.1, PG I or II; or Division 6.1, PG I or II, for unloading while it remains on a transport vehicle with the motive power unit attached, unless it conforms to the requirements in §177.834(o) of this subchapter.

(d) *Use of IMDG Code in port areas.* (1) Except for Division 1.1, 1.2, and Class 7 materials, a hazardous material being imported into or exported from the United States or passing through the United States in the course of being shipped between locations outside the United States may be offered and accepted for transportation and transported by motor vehicle within a single port area, including contiguous harbors, when packaged, marked, classed, labelled, stowed and segregated in accordance with the IMDG Code, offered and accepted in accordance with the requirements of subparts C and F of part 172 of this subchapter pertaining to shipping papers and placarding, and otherwise conforms to the applicable requirements of part 176 of this subchapter.

(2) The requirement in §172.201(d) of this subchapter for an emergency telephone number does not apply to shipments made in accordance with the IMDG Code if the hazardous material is not offloaded from the vessel, or is offloaded between ocean vessels at a U.S. port facility without being transported by public highway.