SAFETY DATA SHEET - ROLLS 12V, 24V, 36V & 48V LFP ($LiFePO_4$) BATTERY

1. IDENTIFICATION

Product Identifier:
Lithium ion cells and battery packs, $LiFePO_4$

Product Names:
R12-100LFP, R12-135LFP, R12-150LFP, R12-200LFP, R12-300LFP R24-50LFP, R24-100LFP, R24-150LFP, R24-64LFP FT, R24-76LFP FT, R36-52LFP, R36-60LFP, R36-65LFP, R48-105EV-LFP A/B, S12-100LFP, S12-135LFP, S12-150LFP, S12-200LFP, S12-300LFP, S24-50LFP, S24-100LFP, S24-150LFP, S48-32LFP, S48-35LFP, S48-105LFP, S48-100LFP ESS

Manufacturer:
Surrette Battery Company Limited

Other means of identification:
Rolls Battery LFP Battery / Rolls Battery lithium /Lithium ion /Rolls Battery cell / module / battery /pack /system / Battery module /battery / pack / system

Recommended Use:
Electrochemical energy storage – industrial use

Supplier Name & Address:
Rolls Battery Engineering
PO Box 2020, 58 Lisgar St.
Springhill, Nova Scotia, Canada
B0M 1X0
Tel: 1-800-681-9914
rollsbattery.com

Emergency Phone #:
1-800-681-9914

2. HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Classification according to Regulation (EC) No 1272/2008 [CLP]
This product is considered as a manufactured article, and not classified as hazardous according to EC 1272/2008.

Classification according to Directive 67/548/EEC
This product is not classified as hazardous according to Directive 67/548/EEC.

Classification according to Directive 1999/45/EC
This product is not classified as hazardous according to Directive 1999/45/EC.

2.2 LABEL ELEMENTS

Symbols / Pictograms – No pictogram is used

Signal word – No signal word is used

Hazard statements – Not classified

Precautionary statements – Not classified

2.3 OTHER HAZARDS

Primary route(s) to exposure

This product is safe with normal use. Exposure to the ingredients contained within and/or their combustion products could be harmful. Risk of exposure occurs only if the battery is mechanically, thermally, or electrically abused and the enclosure is ruptured. If this occurs, exposure to electrolyte can occur by inhalation, ingestion, eye contact, and skin contact. The battery should not be opened or burned.

Inhalation

Inhalation of material from a sealed battery/cell is not an expected route of exposure. Vapors or mists from a ruptured battery/cell may cause respiratory irritation.

Ingestion

Swallowing of material from a sealed battery/cell is not an expected route of exposure. Swallowing the contents of a ruptured cell may cause serious chemical burns of the mouth, esophagus, and gastrointestinal tract.

Skin

Contact between the skin and battery will not cause harm. Contact with the contents of a ruptured cell/ battery can cause severe irritation or burns to the skin.

Eye

Contact between the eye and battery will not cause harm. Contact with the contents of a ruptured cell/ battery can cause severe irritation or burns to the eye.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 SUBSTANCES

Product is a manufactured article. Exposure to interior of article is not expected with normal use.

3.2 MIXTURE

Product is a manufactured article. Exposure to hazardous ingredients is not expected with normal use.
Composition for Li-ion cell used inside product.

CHEMICAL NAME	CONCENTRATION OR CONCENTRATION RANGES (%)	CAS NUMBER
Phosphoric acid,iron(2+) Lithium salt(1:1:1)	40.85	15365-14-7
Graphite (C)	11.27	7782-42-5
Copper (Cu)	9.11	7440-50-8
Polyethylene (C2H4)n)	0.02	9002-88-4
Stainless steel	14-16	96-49-1
Polypropylene (C3H6)n	23.02	12597-68-1
PVC (Chloroethylene,polymer)	0.54	9002-86-2
Tin (Sn)	0.49	7440-31-5
Phosphate(1-), Hexafluoro-lithium (LiPF6)	0.2	21324-40-3
Propylene carbonate C4H6O3	3.5	108-32-7
Dimethyl carbonate C3H6O3	11	616-38-6

These chemicals are contained in a sealed can, inside a sealed container. Risk of exposure only occurs if battery is mechanically, thermally or electrically abused.

4: FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

General advice

In all cases of doubt, or when symptoms persist, seek medical attention. Contact of electrolyte and extruded lithium with skin and eyes should be avoided.

Eyes

Not an expected route of exposure. Following eye contact, cautiously rinse affected eye with clean luke-warm water for at least 30 minutes. Remove contact lenses, if present and easy to do. If eye irritation persists, seek medical attention.

Skin

Not expected to present as skin hazard under anticipated conditions of normal use. Following skin contact, immediately remove contaminated clothing and wash skin with copious amounts of soap and water. If irritation or pain persists, seek medical attention.

Ingestion

Following ingestion, rinse out mouth with water. DO NOT INDUCE VOMITING. Seek immediate medical attention.

Inhalation

Not an expected route of exposure. If inhaled electrolyte, remove victim to fresh air and remove source of contamination from area. Keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, seek medical attention.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Acute effects

Direct contact of internal electrolyte gel with eyes may cause severe burns or blindness

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Direct contact of internal electrolyte gel with the skin may cause skin irritation or damaging burns.Vapor or mist can irritate the eyes, mucous membranes and respiratory tract. Exposure can cause nausea, dizziness and headache.

Chronic/delayed effects

Overexposure to the internal electrolyte gel may cause reproductive disorder(s) based on tests with laboratory animals. Target organs affected could be kidneys, central nervous system, eyes, and male reproductive system. Overexposure may cause cancer. Target organs are the brain, intestine, mammary gland, haematopoietic system and kidneys.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

Treat symptomatically.

5: FIREFIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Suitable extinguishing media

Water, dry chemical powder, carbon dioxide (CO2) and foam are most effective to extinguish a battery fire.

For small fires use only sand, dry chemical powder, CO2 or regular foam. Continuously apply media until fire is extinguished.

For large fires, use copious quantities of water spray. Continuously apply media until fire is extinguished. Large fires should only be extinguished by trained fire fighters.

Unsuitable extinguishing media

Do not use small quantities of water. If water spray is used, it must be continually applied until fire is extinguished.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Battery may vent when subjected to excessive heat-exposing, fire or over voltage condition. Risk of explosion by fire is anticipated if batteries are disposed of in fire. Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

The interaction of water or water vapour with electrolyte may result in the generation of hydrogen and hydrogen fluoride (HF) gas.

Contact with battery electrolyte may be irritating to the skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures, when damaged or abused.

Burning cells may ignite other cells or objects within close proximity.

5.3 ADVICE FOR FIREFIGHTERS

Large lithium ion battery fires should only be extinguished by properly equipped fire fighters with training specific to lithium ion battery fires.

Wear NIOSH/MSHA/EN469-approved self-contained breathing apparatus (SCBA) and protective clothing when fighting chemical fires.

6: ACCIDENTAL RELEASE MEASURES

The material contained within the batteries is only released if the battery is mechanically, thermally, or electrically abused and the enclosure is ruptured.

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Evacuate personnel to safe areas

Ensure adequate ventilation, especially in confined areas

Remove all sources of ignition

Avoid contact with skin, eyes and inhalation of vapours

User personal protection recommended in Section 8.3

6.2 ENVIRONMENTAL PRECAUTIONS

Prevent further leakage or spillage if safe to do so

Do not allow electrolyte to flow into any sewer, on the ground or into any body of water

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Add neutralizer/absorbent, e.g. sand or vermiculite, to spill area. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

6.4 REFERENCE TO OTHER SECTIONS

See Section 7 for more information

See Section 8 for more information

See Section 13 for more information

7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Do not open, disassemble, crush, puncture, or burn product. If battery case is broken, avoid contact with internal components. Do not handle near heat, sparks, or open flames.

Remove metallic accessories, rings and other jewelry when handling live batteries. Protect containers from physical damage to avoid leaks and spills.

Place cardboard between layers of stacked batteries to avoid damage and short circuits,

Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Insulate positive and negative terminals to avoid short circuit. Avoid mechanical or electrical abuse. Store product in cool, dry and ventilated area, which is subjected to little temperature changes. Storage at high temperatures, or exposure to direct sunlight for long periods, should be avoided. The recommended temperature range for extended storage is 0°C (32°F) – 35°C (95°F), not to exceed 60°C (140°F). If the battery is subject to storage for 3 months or longer, it is recommended to recharge the battery periodically. Elevated temperatures may result in shortened battery life.

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Keep out of reach of children.

Store in accordance with local regulations.

7.3 SPECIFIC END USE(S)

Apart from the uses mentioned in SECTION 1.2 no other specific uses are stipulated.

8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Occupational exposure limits

Exposures to hazardous substances are not expected when product is used for its intended purpose. See Section 8.2 for ingredients with limit values that require monitoring at the workplace if a battery case has been compromised or damaged.

Biological limit values

Exposures to hazardous substances are not expected when product is used for its intended purpose.

Exposure limits at intended use

Exposures to hazardous substances are not expected when product is used for its intended purpose.

Derived No Effect Level (DNEL) / Predicted No Effect Concentration (PNEC) values

Not applicable.

Risk management measures according to used control banding approach

Not applicable.

8.2 INGREDIENTS WITH LIMIT VALUES

REGION / CHEMICAL	GRAPHITE (CAS #: 7782-42-5)	COPPER (CAS #: 7440-50-8)	ALUMINUM (CAS #: 7429-90-5)	LITHIUM, HEXA-FLUORPHOSPHATE (LIPF6) (CAS #: 21324-40-3)
Australia	3 mg/m3	1 mg/m3 0.2 mg/m3	10 mg/m3 5mg/m3	2.5 mg/m3
Austria	STEL: 10 mg/m3 TWA: 5 mg/m3	STEL: 4mg/m3 STEL: 0.4 mg/m3 TWA: 1 mg/m3 TWA: 0.1 mg/m3	STEL 20 mg/m3 TWA: 10 mg/m3	–
Belgium	–	–	–	–
Denmark	TWA: 2.5 mg/m3	TWA: 1.0 mg/m3 TWA: 0.1 mg/m3	TWA: 5 mg/m3 TWA: 2 mg/m3	TWA: 2.5 mg/m3
European Union	–	–	–	–
France	–	TWA: 0.2 mg/m3 TWA: 1 mg/m3 STEL: 2 mg/m3	TWA: 10 mg/m3 TWA: 5 mg/m3	–
Finland	–	TWA: 1 mg/m3 TWA: 0.1 mg/m3	TWA: 1.5 mg/m3	–
Germany	–	TWA: 0.01 mg/m3 Ceiling/peak: 0.02 mg/m3 Ceiling/peak: 0.2 mg/m3	TWA: 4 mg/m3 TWA: 1.5 mg/m3	TWA: 1 mg/m3 Skin
Italy	–	–	–	–
Latvia	–	TWA: 0.5 mg/m3 STEL: 1 mg/m3	TWA: 2 mg/m3	–
Netherlands	–	TWA: 0.1 mg/m3	–	–
Norway	–	TWA: 0.1 mg/m3 TWA: 1 mg/m3 STEL: 0.1 mg/m3 STEL: 1 mg/m3	TWA: 5 mg/m3 STEL: 5 mg/m3	–
Poland	–	–	TWA: 2.5 mg/m3 TWA: 1.2 mg/m3	–
Portugal	–	–	TWA: 10 mg/m3 TWA: 5 mg/m3	–
Spain	–	–	TWA: 10 mg/m3 TWA: 5 mg/m3	–
Switzerland	–	–	TWA: 3 mg/m3	–
United Kingdom	–	–	STEL: 30 mg/m3 STEL: 12 mg/m3 TWA: 10 mg/m3 TWA: 4 mg/m3	–
Other:				
ACGIH TLV	TWA: 2.0 mg/m3 Respirable fraction all forms except graphite fibers	TWA: 0.2 mg/m3 fume TWA: 1 mg/m3 Cu dust & mist	TWA: 1mg/m3 respirable fraction	TWA: 2.5 mg/m3 F
OSHA PEL	–	–	TWA: 15 mg/m3 total dust TWA: 5 mg/m3 respirable fraction (vacated) TWA: 15 mg/m3 total dust (vacated) TWA: 5 mg/m3 respirable fraction (vacated) TWA: 5 mg/m3 Al	–
NIOSH IDLH	–	IDLH: 100 mg/m3 dust, fume & mist IDLH: 100 mg/m3 Cu dust & mist TWA: 1 mg/m3 dust & mist TWA: 0.1 mg/m3 fume TWA: 1 mg/m3 Cu dust & mist	TWA: 10 mg/m3 total dust TWA: 5 mg/m3 respirable dust TWA: 5 mg/m3 Al	–

8.3 EXPOSURE CONTROLS

Appropriate engineering controls

Not necessary under normal conditions. Broken or leaking batteries should be handled in accordance with good industrial hygiene and safety practices. Wash hands before work breaks and at the end of workday. Do not eat, drink or smoke while handling leaking batteries.

Personal protective equipment

Eye/face protection: Not necessary under conditions of normal use. In case of battery rupture or leakage, wear safety goggles or side shields when handling.

Skin protection: Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and nitrile, neoprene, or natural rubber gloves when handling an open or leaking battery. Inspect gloves prior to use. Change disposable gloves within 30 minutes of obvious contamination by electrolyte. Remove dirty gloves by appropriate technique. Do not touch outer surface of glove.

Respiratory protection: Not necessary under conditions of normal use. In case of battery venting or rupture, inside an enclosed space, use NIOSH approved or equivalent self-contained breathing apparatus.

8.4 ENVIRONMENTAL EXPOSURE CONTROLS

Comply with the handling and storage guidelines in Section 7. Do not allow any spilled electrolyte from damaged product in any sewer, on the ground, or into any body of water.

9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON THE BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance – Solid. Battery system, battery module, or cell.

Color – Multicolour

Odor – Odourless

Odor threshold – Not applicable

pH – Not applicable

Melting point / freezing point – Not applicable

Initial boiling point / boiling range – Not applicable

Flash point – Not applicable

Evaporation rate – Not applicable

Flammability – Not applicable

Flammability limit in air – Not applicable

Vapor pressure – Not applicable

Vapor density – Not applicable

Density – Not applicable

Specific gravity – Not available

Solubility in water – Insoluble

Partition coefficient: n-octanol/water – Not applicable

Auto-ignition temperature – Not applicable

Decomposition temperature – Not applicable

Viscosity – Not applicable

Explosive properties – Not applicable

Oxidizing properties – Not applicable

9.2 OTHER INFORMATION – Electrical specifications

MODEL	R12-100LFP	S12-135LFP	R36-52LFP	R48-105LFP	S48-100LFP ESS
NOMINAL CAPACITY	12.8V	12.8V	38.4V	51.2V	51.2V
ELECTRIC CAPACITY	100 AH	135 AH	52 AH	105 AH	100 AH
ELECTRIC ENERGY	1.28 KWh	1.728 KWh	2.0 KWh	5.38 KWh	5.12 KWh

10: STABILITY AND REACTIVITY

10.1 REACTIVITY

Stable under recommended storage and handling conditions (see Section 7, Handling and storage)

10.2 CHEMICAL STABILITY

Stable under recommended storage conditions.

10.2 CHEMICAL STABILITY

Stable under recommended storage conditions.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.

If a battery is severely heated by a surrounding fire, acrid or harmful fumes may be emitted.

If leaked, do not allow contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

10.4 CONDITIONS TO AVOID

Avoid mechanical or electrical abuse, including: external short circuit of battery, deformation by crush, direct sunlight, high humidity, temperatures exceeding 60°C (140°F), puncture, sources of ignition, or installation with incorrect polarity.

10.5 INCOMPATIBLE MATERIALS

Strong bases, combustible organic materials, reducing agents, strong oxidizers, and sea water or other electrically conductive liquids.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

A compromised battery may emit irritating or toxic fumes and gases, including metallic oxide, hydrogen fluoride, carbon monoxide, and carbon monoxide.

11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

Skin corrosion/irritation – Non-irritating to the skin under normal conditions

Serious eye damage/irritation – No eye irritation under normal conditions

Respiratory or skin sensitization – No information available.

Germ cell mutagenicity – No information available.

Carcinogenicity – Risk of exposure occurs only if the battery enclosure is compromised.

Reproductive toxicity – Risk of exposure occurs only if the battery enclosure is compromised.

STOT-single exposure – No information available.

STOT-repeated exposure – No information available.

Aspiration hazard – No information available

12: ECOLOGICAL INFORMATION

When properly used or disposed, the batteries do not present environmental hazard.

CHEMICAL NAME	ALGAE/AQUATIC PLANTS EC50	FISH LC50	CRUSTACEA EC50
Copper (CAS #: 7440-50-8)	0.031 – 0.054 mg/L/96h Pseudokirchnerilla subcapitata static 0.0426 – 0.0535 mg/L/72h Pseudokirchneriella subcapitata static	1.25: 96h Lepomis macrochirus mg/L LC50 static 0.3: 96h Cyprinus carpio mg/L LC50 semi-static 0.8: 96h Cyprinus carpio mg/L LG50 Static 0.112: 96 h Poecilia reticulate mg/L LC50 Flow-through 0.0068 – 0.0156: 96 h Pimephales promelas mg/L LC50 0.3: 96h Pimephales promelas mg/L LC50 static 0.2: 96h Pimephales promelas mg/L LC50 flow-through 0.052: 96h Orcorhynchus mykiss mg/L LC50 flow-through	–
Aluminium (CAS #: 7429-90-5)	–	>50 mg/L/96h	–

12.2 PERSISTENCE AND DEGRADABILITY

Not readily biodegradable.

12.3 BIOACCUMULATIVE POTENTIAL

No information available.

12.4 MOBILITY IN SOIL

No information available.

12.5 RESULTS OF PBT AND VPVB ASSESSMENT

Not applicable.

12.6 OTHER ADVERSE EFFECTS

Batteries and cells released in the environment will slowly degrade and may release toxic or harmful substances. Batteries should be disposed or recycled according to local regulations.

13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Recycling is encouraged. Do not throw out a used battery or cell in the landfill. Electrolyte should not be dumped into any sewers, on the ground, or into any body of water. Recycle through a qualified recycling company.

Canada – Dispose of in accordance with local, state and federal laws and regulations.

Europe – Dispose of in accordance with relevant EC Directives and national, regional, and local environmental control regulations. For disposal within the EC, the appropriate code according to the European List of Wastes (LoW) should be used.

USA – Dispose of in accordance with local, state and federal laws and regulations.

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics is the responsibility of the end user. Store material for disposal as indicated in Section 7.

14: TRANSPORT INFORMATION

Rolls S12-100LFP battery model (and internal cells) has independently passed testing required by Section 38.3 of the UN Manual of Tests and Criteria.

14.1 UN NUMBER

Air transport (ICAO/IATA) – UN3480 or UN3481

Sea transport (IMDG) – UN3480 or UN3481

Inland waterway transport (ADN) – UN3480 or UN3481

Land transport (ADR/RID) – UN3480 or UN3481

14.2 PROPER SHIPPING NAME

Air transport (ICAO/IATA) – Lithium Ion Batteries

Sea transport (IMDG) – Lithium Ion Batteries

Inland waterway transport (ADN) – Lithium Ion Batteries

Land transport (ADR/RID) – Lithium Ion Batteries

14.3 HAZARD CLASS

Air transport (ICAO/IATA) – 9

Sea transport (IMDG) – 9

Inland waterway transport (ADN) – 9

Land transport (ADR/RID) – 9

14.4 PACKING GROUP

Air transport (ICAO/IATA)

Sea transport (IMDG)

Inland waterway transport (ADN)

Land transport (ADR/RID)

14.5 ENVIRONMENTAL HAZARDS

Dangerous goods

14.6 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE

Worldwide air transportation:

The goods are packaged according to Section 1A of PACKING INSTRUCTION 965 of the 2016 IATA Dangerous Goods. Lithium-ion batteries may be air transported on CARGO AIRCRAFT ONLY and are forbidden in passenger aircraft.

Worldwide sea transportation:

The goods are packaged according to the special provision 188 of IMDG. IMO-IMDG Code [P903]

14.7 LABELING

Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium-ion batteries which are assigned Class 9. Refer to relevant transportation documents. Lithium and lithium-ion cells and batteries are regulated in the USA in accordance with Part 49 Regulations of the Code of Federal Regulations, (49 CFR Sections 105-180) of the U.S. Hazardous Materials Regulations.

Lithium-ion batteries, under UN3480, PI 965, Section 1A, must be declared as CARGO AIRCRAFT ONLY (CAO) if shipped by air.

15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE CANADA

This is not a controlled product under WHMIS. This product meets the definition of a “manufactured article” and is not subject to the regulations of the Hazardous Products Act.

All ingredients in the product are listed, as required, on the DSL/NDSL.

This product does not contain any NPRI Substances.

Europe

Under normal use, this product is not classified as hazardous according to:

Regulation (EC) No 1272/2008

Directive 67/548/EEC

Directive 1999/45/EC

Risk phrases – None | Safety phrases S2: Keep out of the reach of children.

USA

This product is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA hazard communication standard requirement.

TSCA Status All ingredients in the product are listed on the TSCA inventory.

SARA Title III

Sec. 302/304 – None

Sec. 311/312 – None

Sec. 313 – None

CERCLA RQ – None

California Prop 65 This product does not contain chemicals know to the State of California to cause cancer or reproductive toxicity.

16: OTHER INFORMATION

This material Safety Data Sheet (SDS) complies with the requirements of Regulation (EC) No. 1907/2006.

16.1 TERMS & DEFINITIONS

Key or legend to abbreviations and acronyms used in the SDS:

AICS Australian Inventory of Chemical Substances

Ceiling Maximum limit value

DSL/NDSL Canadian Domestic Substances List / Non-Domestic Substances List

ENCS Japan Existing and New Chemical Substances

EINECS/ELINCS European Inventory of Existing Chemical Substances / European List of Notified

IATA International Air Transport Association

IECSC China Inventory of Existing Chemical Substances

IMDG International Maritime Dangerous Goods

KECL Korean Existing and Evaluated Chemical Substances

NPRI National Pollutant Release Inventory

STEL Short Term Exposure Limit

TSCA United States Toxic Substances Control Act Section 8(b) Inventory

STOT RE Specific Target Organ Toxicity – repeated exposure

TWA Time Weighted Average

WHMIS Workplace Hazardous Materials Information System

Full text of H-Statements referred to under Section 3

H228 Flammable solid

H261 Contact with water releases flammable gases

H301 Toxic if swallowed

H314 Causes severe skin burns and eye damage

H317 May cause an allergic reaction

H351 Suspected of causing cancer

H372 Causes damage to organs through prolonged or repeated exposure if inhaled

H412 Harmful to aquatic life with long lasting effects

16.3 MANUFACTURER DISCLAIMER

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