Product Information Sheet

May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200. This standard must be consulted for specific requirements.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Lithium-ion Battery - Rechargeable

Drawing Number: MSDS150014-18

Issue Date: Sept. 2019

Supersedes Date: N/A

Techtronic Product Development Limited or

Techtronic Industries (Dongguan) Co. Ltd.

28/F&29/F, Tower 2, Kowloon Commerce Centre,
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Company Phone Number: +852 2402 6888

Emergency Contact Number: +1-800-424-9300 USA only

Chemtrec

For International: +1 703-741-5970

PRODUCT NUMBERS: See Annex I

SECTION 2: HAZARDS IDENTIFICATION

Health	Environmental	Physical
Eye Irritation: No classified hazards	**Acute Toxicity:** No classified hazards	**Flammable liquid**: No classified hazards
Skin Irritation: No classified hazards	**Chronic Toxicity:** No classified hazards	
Acute Toxicity, Oral: No classified hazards		
Acute Toxicity, Inhalation: No classified hazards		

GHS Label
No applicable labeling

Hazard Statements	Precautionary Statements
No exposure during routine handling of product	

CLASSIFIED HAZARDS

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200. This SDS contains valuable information for the safe handling and proper use of this product. Save this SDS for future reference.

OTHER HAZARDS

Flammable:

Organic components will burn if cell is incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride.

Potential Health Effects:

Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations

WARNING:

No exposure during routine handling of product. Hydrofluoric Acid exposure during firefighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.

SECTION 3: COMPOSITION /INFORMATION OF INGREDIENTS

Chemical Name	CAS #	Concentration
Aluminum Foil	7429-90-5	0.1 - 10
Biphenyl (BP)	92-52-4	0.1 - 0.3
Copper Foil	7440-50-8	0.1 - 10
Linear & Cyclic Carbonate solvents	N/A	0 - 20
Graphite Powder/Carbon	7440-44-0	0 - 30
Metal Oxide(proprietary)	Confidential	0 - 50
Lithium Hexaflurophosphate ($LiPF_6$)	21324-40-3	0 - 5
Polyvinylidene Flouride (PVDF)	24937-79-9	0 - 10
Styrene Butadiene Rubber (SBR)	N/A	0 - 5
Aluminum, Steel, Nickel and other inert materials	N/A	Remainder

SECTION 4: FIRST AID MEASURES

No exposure during routine handling of product. Risk of exposure occurs only if the battery is mechanically or electrically abused.

No effect under routine handling and use to eyes, skin or if inhaled. Ingestion is not likely, given the physical size and state of the cell. If swallowed, seek medical attention immediately.

If exposure to internal materials within cell due to damaged outer casing the following actions are recommended:

EYE CONTACT:

Flush with water for 15 minutes without rubbing and immediately seek medical attention.

SKIN CONTACT:

Wash area immediately with soap and water. If irritation continues see medical attention.

INHALATION:

Leave area immediately and move to fresh air and seek medical attention.

INGESTION:

If swallowed, contact POISON CONTROL CENTER/DOCTOR immediately.

SECTION 5: FIRE FIGHTING MEASURES

NFPA 704 Hazard Class



HMIS



0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

SUITABLE EXTINGUISHING MEDIA:

Water spray, carbon dioxide, dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials.

UNSUITABLE EXTINGUISHING MEDIA:

None.

PRODUCTS OF COMBUSTION:

Organic components will burn if incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride. In case of fire in an adjacent area, use water, CO_2, or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products.

PROTECTION OF FIREFIGHTERS:

Hydrofluoric Acid exposure during firefighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Use standard industrial clothing in normal use. If handling large containers of cells wear steel-toed footwear.

ENVIRONMENTAL PRECAUTIONS:

No special precautions necessary.

METHODS FOR CONTAINMENT:

Transport container outdoors. Hold burned cells and fire cleanup solids for disposal as potential hazardous waste. Unburned cells are not hazardous waste. A fire with over 100 kg of cells burnt will likely require reporting to environmental officials. Always consult and obey all international, federal and local environmental laws.

METHODS FOR CLEAN-UP:

No data available

OTHER INFORMATION:

No data available

SECTION 7: HANDLING AND STORAGE

HANDLING:

Use only approved charging equipment. Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.

STORAGE:

Store in a cool, dry place away from sparks and flame. Keep below 125°C. Keep above -60°C. Charge between 0°C and 45°C.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	OSHA PEL	ACGIH TLV	California Prop 65 Reg. Y/N	IARC/NTP Y/N
Aluminum Foil	TWA 5mg/m^3*	TWA 5mg/m^3*	N	N
Biphenyl (BP)	NA	NA	N	N
Copper Foil	NA	NA	N	N
Linear & Cyclic Carbonate solvents	NA	NA	N	N
Graphite Powder/Carbon	NA	NA	N	N
Metal Oxide or other Electrolyte (proprietary)	NA	NA	N	N
Lithium Hexaflurophosphate ($LiPF_6$)	NA	NA	N	N
Polyvinylidene Flouride (PVDF)	NA	NA	N	N
Styrene Butadiene Rubber (SBR)	NA	NA	N	N
Aluminum, Steel, Nickel and other inert materials	NA	NA	N	N

EYE PROTECTION:

Not necessary under conditions of normal use

SKIN PROTECTION:

Not necessary under conditions of normal use

RESPIRATORY PROTECTION:

Not necessary under conditions of normal use

ENGINEERING CONTROLS:

Not necessary under conditions of normal use

GENERAL HYGIENE CONSIDERATIONS:

Not necessary under conditions of normal use

EXPOSURE GUIDELINES:

Not necessary under conditions of normal use

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Data represent typical values and are not intended to be specifications. NA=Not Applicable; ND=Not Determined

Physical state:..... Solid
Colour: ..... NA
Odor: ..... Odorless
Odor Threshold: ..... NA
pH: ..... NA
Melting/Freezing Point: ..... NA
VOC Content:..... NA
Boiling Point: ..... NA
Flash Point: ..... NA
Evaporation Rate:..... NA
Specific Gravity: ..... NA

Viscosity:..... NA
Upper Explosive Limits (vol % in air): ..... NA
Lower Explosive Limits (vol % in air):..... NA
Vapor pressure: ..... NA
Vapor density: ..... NA
Relative density: ..... NA
Solubility:..... NA
Partition Coefficient: ..... NA
Auto-ignition Temperature: ..... NA
Decomposition Temperature:..... NA
Flammability (solid, gas): ..... Organic components will burn if cell is incinerated

SECTION 10: STABILITY AND REACTIVITY

INCOMPATIBLE MATERIALS:

Water, heat and strong acids.

DECOMPOSITION PRODUCTS MAY INCLUDE:

Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Manganese Oxides, Aluminum Oxide, possible fluoro-compounds, Carbon soot.

CONDITIONS TO AVOID:

Do not crush, puncture, incinerate, immerse in water or heat over 212°F (100°C). Steel casing slowly dissolves in strong mineral acids.

POLYMERIZATION:

Hazardous polymerization will not occur. Spontaneous decomposition will not occur at normal temperature.

CHEMICAL STABILITY:

This product is stable.

REACTIVITY:

Hazardous polymerization will not occur. Spontaneous decomposition will not occur at normal temperature.

SECTION 11: TOXICOLOGY INFORMATION

LIKELY ROUTES OF EXPOSURE: Inhalation, Eye and Skin contact

Eye contact, skin contact, skin absorption, inhalation only if burned. Hydrofluoric acid is extremely corrosive. Contact with hydrogen fluoride fumes is to be avoided. Permissible exposure limit is 3ppm. In case of contact with hydrogen fluoride fumes, immediately leave the area and seek first aid **and** emergency medical attention. Symptoms may have delayed onset. Fluoride ions penetrate skin readily causing destruction of deep tissue layers even bone. Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations. Immediately flush eyes or skin with water for at least 20 minutes to neutralize the acidity and remove some fluoride. Remove and destroy all contaminated clothing and permeable personal possessions. Before re-use, impermeable possessions should be soaked in benzalkonium chloride after washing. Following flushing of the affected areas, an iced aqueous solution of benzalkonium chloride or 2.5% calcium gluconate gel should be applied to react with the fluoride ion. Compresses and wraps may be used for areas where immersion is not practical.

Medicated dressing should be changed every 2 minutes. Exposure to hydrofluoric acid fumes sufficient to cause pain requires immediate hospitalization for monitoring for pulmonary edema.

ACUTE SYMPTOMS AND EFFECTS:

Inhalation: No further toxicological data known
Eye contact: No further toxicological data known
Skin contact: No further toxicological data known
Ingestion: No further toxicological data known

OTHER:

No further data known.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

None in routine handling of product.

TOXICITY:

No data available

PERSISTENCE AND DEGRADABILITY (BIOPERSISTENCY & BIODEGRADABILITY):

None in routine handling of product.

POTENTIAL OF BIOACCUMULATION:

None in routine handling of product.

MOBILITY IN SOIL:

None in routine handling of product.

OTHER ADVERSE EFFECTS:

No data available

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL:

Dispose in accordance with appropriate regulations. Always consult and obey all international, federal, provincial/state and local hazardous waste disposal laws. Some jurisdictions require recycling of this spent product. Battery recycling is encouraged. Lithium ion batteries are safe for disposal in the normal municipal waste stream since they are not defined by the federal government as hazardous waste. However, Lithium ion batteries are recyclable.

This product does not contain mercury, cadmium or Lithium (metal).

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F (100°C).

SECTION 14: TRANSPORTATION INFORMATION

U.S. DOT HAZARDOUS MATERIAL REGULATIONS (RE: GROUND TRANSPORT)

Proper Shipping Description:

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

TPD Ltd. Lithium-ion batteries are to be shipped in compliance with relevant requirements of HMR "49 CFR 173.185".

CANADA TRANSPORT DANGEROUS GOODS (RE: GROUND TRANSPORT)

Proper Shipping Description:

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

TPD Ltd. Lithium-ion batteries are to be shipped in compliance with relevant requirements of TDG "Part 2" (Section 2.43), or TDG "Schedule 2" (Special Provision 34), as applicable.

INTERNATIONAL DANGEROUS GOODS REGULATIONS (RE: AIR, SEA, GROUND TRANSPORT)

Proper Shipping Description:

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

TPD Ltd. Lithium-ion batteries are to be shipped in compliance with relevant requirements of the following DG Regulations:

- IATA Dangerous Goods Regulations – 2019(60th Edition) and ICAO Technical Instructions (2018-2019): Apply Section IA, Section IB in PI965, Section I or Section II in PI966 & PI967, as applicable
- IMDG Code: Packing Instruction P903, or Special Provision 188, as applicable.
- UN Model Regulations on the Transport of Dangerous Goods: Packing Instruction P903, or Special Provision 188, as applicable.
- UN European Agreements (ADR/RID/ADN): Packing Instruction P903, or Special Provision 188, as applicable.
- Australian Dangerous Goods (ADG): Packing Instruction P903, or Special Provision 188, as applicable.

IMPORTANT CONSIDERATIONS:

The proper classification, packaging, labeling, marking, and documentation requirements for shipping Lithium-ion batteries is dependent upon whether the particular batteries are:

a.) Rated at 100 Watt-hours (Wh) or less; or
b.) Rated at greater than 100Wh.

Lithium-ion batteries rated 100Wh or less are excepted from certain Class 9 DG requirements. Always check compliance of Lithium-ion battery consignments against the current DG Regulations in effect that govern the chosen mode of transport. When in doubt, contact the carrier or other trained Dangerous Goods professional to confirm acceptability.

UN 38.3 BATTERY TRANSPORTATION TESTING:

TPD Ltd. rechargeable Lithium-ion batteries listed in Section 1 have passed the relevant transportation test requirements as described in the UN *Manual of Tests and Criteria*, Part III, section 38.3.

UN 38.3 Test Reports are maintained on file at the corporate headquarters of Techtronic Product Development Limited located at 28/F&29F, Tower 2, Kowloon Commerce Centre, 51 Kwai Cheong Road, Kwai Chung, Hong Kong.

SECTION 15: REGULATORY INFORMATION

GLOBAL INVENTORIES

TSCA: United States	See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
DSL: Canada	See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
ECL: Korea	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
PICCS: Philippines	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
ENCS: Japan	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
AICS: Australia	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
IECS: China	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.
EINECS: European Union	Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.

SARA 313 Information:

SARA Title III Section 313: This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR part 372.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

WHMIS: Canadian Workplace

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements

SECTION 16: OTHER INFORMATION

ABBREVIATIONS:

TSCA ..... Toxic Substance Control Act
ICAO ..... International Civil Aviation Organization
IMDG ..... International Maritime Dangerous
OSHA ..... Occupational Safety and Health
IARC/NTP ..... International Agency for Research on Cancer/National Toxicology Program
SARA ..... Superfund Amendments and Reauthorization Act of 1986
ACGIH ..... American Conference of Governmental Industrial Hygienists
NIOSH/MSHA ..... National Institute for Occupational Safety Health/ Mine Safety and Health Administration
WHMIS ..... Workplace Hazardous Materials Information System

Prepared by: Techtronic Product Development Limited

The batteries referenced herein are considered exempt articles and are not subject to the OSHA Hazard Communication Standard; therefore a SDS is not required. This sheet is being provided as a service to our customers.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. ***Techtronic Product Development Limited*** makes no warranty, expressed or implied, regarding the accuracy of this data or the results to be obtained from the use thereto.

Annex I

Table of battery packs:

Brand name	Model number	Voltage (V)	Rated capacity (Ah)	Rated Capacity (Wh)
Ryobi	AP4001	4	1.3	5
Ryobi	CB121L	12	1.3	14
Ryobi	P102	18	1.3	24
Ryobi	P105	18	2.6	48
Ryobi	P107	18	1.5	27
Ryobi	P108	18	4	72
Ryobi	HP108L	8	1.3	9.5
Ryobi	HP44L	4	1.3	5
Ryobi	OP242	24	2.6	56
Ryobi	OP243	24	1.5	33
Ryobi	OP4015	40	1.5	54
Ryobi	OP4026	40	2.6	95
Ryobi	OP4040	40	4	144
Ryobi	BSPL1213	12	1.3	15
Ryobi	RB12L13	12	1.3	14
Ryobi	BPL1414	14.4	1.4	19
Ryobi	RB14L15	14.4	1.5	21.9
Ryobi	RB14L25	14.4	2.5	36
Ryobi	RB18L13	18	1.3	24
Ryobi	RB18L26	18	2.6	48
Ryobi	RB18L15	18	1.5	27
Ryobi	RB18L40	18	4	72
Ryobi	RB18L25	18	2.5	45
Ryobi	RB18L50	18	5	90
Ryobi	R8DD-L13	8	1.3	9.5
Ryobi	BPL3615	36	1.5	54

Annex I

Table of battery packs (Continued):

Brand name	Model number	Voltage (V)	Rated capacity (Ah)	Rated Capacity (Wh)
Ryobi	BPL3626	36	2.6	93.6
Ryobi	BPL3640	36	4	144
Ryobi	BPL3640D	36	4	144
Ryobi	BPL3650D	36	5	180
Ryobi	BPL3626D	36	2.6	95
Ryobi	BPL3625D	36	2.5	90
Ryobi	ES9200	5	0.4	2
Ryobi	OP4050	40	5	180
Ryobi	BPL3650	36	5	180
Ryobi	RPS1215	12	1.3	14
Ryobi	R7SD	7.2	1.3	9.5
Ryobi	R4SDP	4	1.3	5
Ryobi	P190	18	2	36
Ryobi	RB18L20	18	2	36
Ryobi	OP40261	40	2.6	95
Ryobi	P194	18	9	162
Ryobi	P189	18	1.5	27
Ryobi	OP4030	40	3	108
Ryobi	RB18L90	18	9	162
Ryobi	BPL3626D2	36	2.6	95
Ryobi	BPL3630D	36	3	108
Ryobi	RB18L15B	18	1.5	27
Ryobi	P192	18	4	72
Ryobi	RB18L40B	18	4	72
Ryobi	OP40301	40	3	108

Annex I

Table of battery packs (Continued):

Brand name	Model number	Voltage (V)	Rated capacity (Ah)	Rated Capacity (Wh)
Ryobi	OP40501	40	5	180
Ryobi	BPL3650D2	36	5	180
Ryobi	P191	18	3	54
Ryobi	RB18L30	18	3	54
Ryobi	RB18L30A	18	3	54
Ryobi	RB18L20A	18	2	36
Ryobi	P192	18	4	72
Ryobi	RB18L40B	18	4	72
Ryobi	RB18L40A	18	4	72
Ryobi	RB18L90A	18	9	162
Ryobi	ERGO	4	1.5	5
Ryobi	ERGO	4	1.3	5
Ryobi	P193	18	6	108
Ryobi	RB18L60	18	6	108
Ryobi	RB18L60A	18	6	108
Ryobi	RB18L15A	18	1.5	27
Ryobi	P102	18	1.5	27
Ryobi	P197	18	4	72
Ryobi	HP34L	4	1.5	5
Ryobi	RB18L25A	18	2.5	45
Ryobi	RB18L40A	18	4	72
Ryobi	OP40601	40	6	216
Ryobi	OP40501	40	5	180
Ryobi	OP40201	40	2	72
Ryobi	OP40401	40	4	144

Annex I

Table of battery packs (Continued):

Ryobi	OP40301	40	3	144
Ryobi	HP108L, R8DD, R7SD	8	1.3	9.5
Ryobi	RB18L50, P177	18	5.0	90
Ryobi	HP44L, R4DSP	4	1.3	5
Ryobi	HP43L, R4SD	4	1.3	5
Ryobi	P191	18	3	54
Ryobi	ERGO, R4SDC	4	1.5	5
Ryobi	ERGO, R4SDC	4	1.3	5
Ryobi	P195, RB18L30, RB18L30A	18	3	54
Ryobi	RB18L25B	18	2.5	45
Ryobi	RB18L50A	18	5	90
Ryobi	BPL3640D2	36	4	144
Ryobi	BPL3660D	36	6	216
Ryobi	BPL3620D	36	2	72
Ryobi	R4SD	4	1.5	6
Ryobi	R4SDP	4	1.5	6
Ryobi	R7SD	7.2	1.5	10.8
Ryobi	R8DD	8	1.5	12
Ryobi	P108, P197, RB18L40, RB18L40A	18	4	73
Ryobi	P108, P197, RB18L40, RB18L40A	18	4	72
Ryobi	OP40602	40	6	216

Annex I

Table of battery packs (Continued):

Ryobi	RY36B60A, BPL3660D	36	6	216
Ryobi	HP34L	4	1.3	5