



## SAFETY DATA SHEET

### Section 1: Product And Company Identification

**Product Name:** Lithium-Ion Battery Packs – Rechargeable **Document Number:** SDS180001-B

**Issue Date:** January 2020

#### Company Identification:

Techtronic Industries (Australia & NZ) Pty Ltd  
21 Kelletts Road,  
Rowville, VIC, 3178  
Australia

**Company Phone Number:** 1300 234 797 (Australia)  
0800 234 797 (New Zealand)

**Emergency Contact Number:**  
13 11 26

Australian Poison Information Centre  
[www.poisonsinfo.nsw.gov.au](http://www.poisonsinfo.nsw.gov.au)

0800 764 766  
New Zealand Poison Information Centre  
[www.poisons.co.nz](http://www.poisons.co.nz)

#### Proper Shipping Name:

- Battery only: **UN 3480 Lithium ion Batteries**
- Battery with equipment **UN 3481 Lithium ion Batteries packed with equipment**

#### Product Numbers:

| Trade Name | Model Number | Voltage (Vdc) | Rated Capacity (Ah) | Rated Capacity (Wh) |
|------------|--------------|---------------|---------------------|---------------------|
| Milwaukee  | M12 B2       | 12V           | 2                   | 24                  |
| Milwaukee  | M12 B3       | 12V           | 3                   | 36                  |
| Milwaukee  | M12 B4       | 12V           | 4                   | 48                  |
| Milwaukee  | M12 B6       | 12V           | 6                   | 72                  |
| Milwaukee  | M18 B2       | 18V           | 2                   | 36                  |
| Milwaukee  | M18 B4       | 18V           | 4                   | 72                  |
| Milwaukee  | M18 B5       | 18V           | 5                   | 90                  |
| Milwaukee  | M28 BX       | 28V           | 3                   | 84                  |
| Milwaukee  | L4 B2        | 4V            | 2.5                 | 10                  |

Supplied with Samsung Li-Ion battery cells, INR18650-30Q or INR18650-20RM or INR18650-25RM or INR18650-15M.

## Section 2: Hazards Identification

|   |   |   |
|---|---|---|
| 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 labelling

| 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 |
|--|--------------|---------------|
| Aluminium 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 - 17        |
| Graphite Powder/Carbon                             | 7440-44-0    | 10 - 30       |
| Metal Oxide or other Electrolyte (proprietary)     | Confidential | 10 - 50       |
| Lithium Hexafluorophosphate (LiPF <sub>6</sub> )   | 21324-40-3   | 0 - 5         |
| Polyvinylidene Fluoride (PVDF)                     | 24937-79-9   | 0.1 - 5       |
| Styrene Butadiene Rubber (SBR)                     | N/A          | <5            |
| Aluminium, Steel, Nickel and other inert materials | N/A          | Remainder     |

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## Section 4: First Aid Measures

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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 pack. 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:

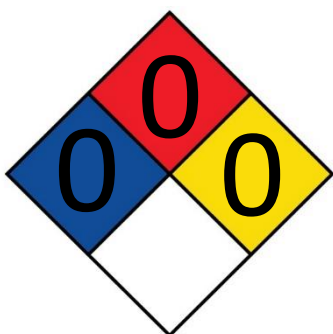
If swallowed, contact POISON CONTROL CENTER immediately.

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## Section 5: Fire Fighting Measures

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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<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.

**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.

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**Section 6: Accidental Release Measures**

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**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 clean-up 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

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**Section 7: Handling and Storage**

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**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 |
|--|----------------|----------------|-----------------------------|--------------|
| Aluminium Foil                                     | TWA<br>5mg/m3* | TWA<br>5mg/m3* | 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 Hexafluorophosphate (LiPF6)                | NA             | NA             | N                           | N            |
| Polyvinylidene Fluoride (PVDF)                     | NA             | NA             | N                           | N            |
| Styrene Butadiene Rubber (SBR)                     | NA             | NA             | N                           | N            |
| Aluminium, 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

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## Section 9: Physical and Chemical Properties

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Data represent typical values and are not intended to be specifications.

NA=Not Applicable; ND=Not Determined

|                         |           |                                       |  |
|-------------------------|-----------|---------------------------------------|--|
| Physical State:         | Solid     | Viscosity:                            | NA   |
| Colour:                 | NA        | Upper Explosive Limits (vol% in air): | NA   |
| Odour:                  | Odourless | Lower Explosive Limits (vol% in air): | NA   |
| Odour Threshold:        | NA        | Vapor Pressure:                       | NA   |
| pH:                     | NA        | Vapor Density:                        | NA   |
| Melting/Freezing Point: | NA        | Relative Density:                     | NA   |
| VOC Content:            | NA        | Solubility:                           | NA   |
| Boiling Point:          | NA        | Partition Coefficient:                | NA   |
| Flash Point:            | NA        | Auto-ignition Temperature:            | NA   |
| Evaporation Rate:       | NA        | Decomposition Temperature:            | NA   |
| Specific Gravity:       | NA        | Flammability (solid, gas):            | Organic components will burn if cell incinerated |

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## Section 10: Stability and Reactivity

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### INCOMPATIBLE MATERIALS:

Water, heat and strong acids.

### DECOMPOSITION PRODUCTS MAY INCLUDE:

Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Manganese Oxides, Aluminium 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.

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## Section 11: Toxicology Information

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### 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.

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## Section 12: Ecological Information

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### 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

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## Section 13: Disposal Considerations

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### 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).

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## Section 14: Transportation Information

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### Proper Shipping Description:

- **UN3480 Lithium ion batteries** - For batteries on their own.
- **UN3481 Lithium ion batteries packed with equipment** - For batteries packed with other equipment.

These Milwaukee Lithium - ion batteries are to be shipped in compliance with relevant requirements of the following DG Regulations:

- **Air:**
  - ICAO Technical Instructions or IATA Dangerous Goods Regulations
    - For **UN3480**
      - Packing Instruction 965, Section IB
    - For **UN3481**
      - Packing Instruction 966, Section IB
- **Sea:**
  - IMDG Code: Packing Instruction P903, or Special Provision 188, as applicable.
- **Road:**
  - Australian Dangerous Goods (ADG): Packing Instruction P903, or Special Provision 188, as applicable.

### UN 38.3 BATTERY TRANSPORTATION TESTING:

Milwaukee 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 Industries (Australia & NZ) Pty Ltd, 21 Kelletts Rd, Rowville, Victoria, Australia.

Milwaukee batteries are shipped with a State of Charge (SOC) less than 30%.



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## **Section 15: Regulatory Information**

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### **GLOBAL INVENTORIES**

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

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## Section 16: Other Information

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### 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/<br>Mine Safety and Health Administration |
| WHMIS      | Workplace Hazardous Materials Information System  |

**Prepared by:** Milwaukee Electric Tool Corporation

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation.

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