

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier:

Lithium Battery

1.2. Relevant identified uses of the mixture and uses advised against:

Energy Storage; Battery Cell and Battery Packs. For professional use.

The product is considered an article according to Regulation 1907/2006/EC (REACH), for which a safety data sheet is not required.

The following information is only indicative in order to ensure safe use of the product.

1.3. Details of the supplier of the safety data sheet:

Brunswick Bowling Products, LLC

525 W. Laketon Ave.

Muskegon, MI 49441. USA

1.3.1. Responsible person: -

E-mail: brunswick.hu@brunswickbowling.com

1.4. Emergency telephone number:

24-hour Emergency Telephone No.: CHEMTEL +1 813-248-0585
Customer Service: Brunswick Bowling Products, LLC: 231-725-4966

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the mixture:

Classification according to Regulation 1272/2008/EC (CLP):

Not applicable to the finished product as an article.

Applicable for the components that are not in contact with the battery when it is in its normal state.

Warning **H statements**: none.

2.2. Label elements:

Warning **H statements**: none.

Precautionary **P statements**: none.

2.3. Other hazards:

The product has no other known specific hazards for human or environment.

Results of PBT and vPvB assessment: this product contains no PBT/vPvB chemicals.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS3.1. Substance:
Not applicable.3.2. Mixture:

Description	CAS number	EU number/ ECHA list number	REACH reg. nr.	Conc. (%)	Classification: 1272/2008/EC (CLP)		
					Hazard pict.	Hazard cat.	H phrase
Lithium Iron Phosphate*	15365-14-7	604-917-2	-	25-50	-	not classified	-
Carbon*	7440-44-0	231-153-3	-	10-25	-	not classified	-
Copper*	7440-50-8	231-159-6	-	1-10	-	not classified	-
Aluminum (pyrophoric) Note T.	7429-90-5	231-072-3	-	1-10	GHS02 Danger	Water-react. 2 Pyr. Sol. 1	H261 H250
Ethylene carbonate*	96-49-1	202-510-0	-	1-10	-	not classified	-
Carbonic acid, dimethyl ester	616-38-6	210-478-4	-	1-10	GHS02 Danger	Flam. Liq. 2	H225
Carbonate, methyl ethyl*	623-53-0	433-480-9	-	1-10	GHS02 Danger	Flam. Liq. 2	H225
Polypropylene*	9003-07-0	618-352-4	-	1-10	-	not classified	-
Phosphate (1-), hexafluoro-, lithium*	21324-40-3	244-334-7	-	1-10	GHS08 GHS05 GHS06 Danger	STOT RE 1 Eye Dam. 1 Skin Corr. 1A Acute Tox. 3	H372 H318 H314 H301

*: Substance classified by the manufacturer or substance which has no obligatory classification according to the EU regulations.

Note T:

This substance may be marketed in a form which does not have the physical hazards as indicated by the classification in the entry in Part 3. If the results of the relevant method or methods in accordance with Part 2 of Annex I of this Regulation show that the specific form of substance marketed does not exhibit this physical property or these physical hazards, the substance shall be classified in accordance with the result or results of this test or these tests. Relevant information, including reference to the relevant test method(s) shall be included in the safety data sheet.

For the full text of H phrases: see Section 16.

SECTION 4: FIRST AID MEASURES4.1. Description of first aid measures:

General:

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

IN CASE OF INGESTION:

Measures:

- If ingestion of internal contents occurs, rinse mouth thoroughly with water.
- Do not induce vomiting.
- If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration and continue to rinse mouth with water.
- Obtain immediate medical attention.

IN CASE OF INHALATION:

Measures:

- If internal contents are inhaled, move victim to fresh air and remove source of contamination from area.
- Seek medical advice.

IN CASE OF SKIN CONTACT:

Measures:

- Contact with internal contents may cause burns.
- If skin contact with internal contents occurs, remove the contaminated clothes.
- Wash the skin surface with plenty of water and soap (for at least 30 minutes).
- If irritation or pain persists, seek medical attention.
- Wash contaminated clothes before reuse or disposal.

IN CASE OF EYE CONTACT:

Measures:

- Contact with internal contents may cause burns. If eye contact with internal contents occurs, flush with water holding eyelids apart and moving the eyeballs (for at least 30 minutes).
- Rinse with neutral saline solution if possible.
- Use caution not to rinse contaminated water into the unaffected eye, nose, mouth, or onto the face.
- Seek medical attention.

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

Overview:

Risk of exposure will only occur if the battery cell is mechanically, thermally, or electrically damaged and the enclosure is compromised. If this occurs, exposure to electrolyte solutions contained within the battery cell may occur by inhalation, eye contact, skin contact and ingestion.

Potential Health Effects:

Acute (Short Term): see Section 8 for Exposure Controls and Personal Protection.

In the event of disassembly or rupture, the electrolyte contained in the cell is corrosive and may cause burns to skin and eyes.

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

Ingestion: Swallowing of material from a sealed battery is not an expected route of exposure. Swallowing mists from a ruptured battery may cause respiratory irritation, chemical burns of the mouth and gastrointestinal tract irritation.

Skin: Contact between the battery and skin will not cause any harm. Skin contact with positive and negative terminals of high voltages may cause burns to the skin. Skin contact with a ruptured battery can cause skin irritation.

Eye: Eye contact with the contents of a ruptured battery can cause severe irritation to the eye.

Medical Conditions Aggravated by Exposure:

Medical conditions related to potential exposure modalities may be exacerbated by exposure to the materials.

See section 2 for further details.

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

No special treatment needed, treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES5.1. **Extinguishing media:**

5.1.1. Suitable extinguishing media:

Water, foam, dry chemical, carbon dioxide.

5.1.2. Unsuitable extinguishing media:

None known.

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

Combustible vapours may be released if exposed to fire.

Exposing battery cell to excessive heat, fire or over voltage condition may cause a leak, fire, hazardous vapours and hazardous decomposition products. Damaged or opened cells or batteries can result in rapid heating and the release of flammable vapours and potentially dangerous gases that may be heavier than air and could travel along the ground or be moved by ventilation to an ignition source.

The interaction of water or water vapor and exposed lithium hexafluorophosphate (Li PF₆) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

5.3. **Advise for firefighters:**

Wear fully protective gear, including self-contained positive pressure breathing apparatus, goggles, fireproofing jacket and gloves. Caution is advised during application of water because burning particles may be ejected from the fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES6.1. **Personal precautions, protective equipment and emergency procedures:**

6.1.1. For non-emergency personnel:

Keep unprotected people away, allow only well-trained experts wearing suitable protective clothing to abide in the field of accident.

- 6.1.2. For emergency responders:
Hazardous material contained within the batteries cells will only be expelled if the battery is damaged or abused. If an accidental release occurs, evacuate the area, except for required containment and clean up personnel. Maintain a minimum clearance of 25 meters (75 feet) in all directions. Stay upwind of the release, keep out of low areas, and ventilate closed areas before re-entering.
Wear appropriate personal protective equipment (see section 8).
- 6.2. Environmental precautions:
Dispose the spillage and the resulting waste according to the applicable environmental regulations. Do not allow the product and the resulting waste to enter sewers/soil/surface or ground water. Notify the respective authorities in accordance with local law in the case of environmental pollution immediately.
Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.
- 6.3. Methods and material for containment and cleaning up:
Prevent released material from contaminating soil or entering sewers or waterways by capping drains or placing barriers.
Stop the release if safe to do so. Contain any spilled liquid with dry sand, earth, or vermiculite. Move the damaged object to an isolated area, containment chamber, or cover with a fire proof containment blanket if safe to do so. Clean up spills immediately.
Wear adequate personal protective equipment as indicated in Section 8. Absorb spilled liquid material with an inert absorbent (dry sand, earth, or vermiculite) material. Collect all debris and contaminated absorbent into an acceptable waste container and dispose of according to directions in Section 13. Scrub the spill area with detergent and water; collect all contaminated wash water for proper disposal.
- 6.4. Reference to other sections:
For further and detailed information see section 8 and 13.

SECTION 7: HANDLING AND STORAGE

- 7.1. Precautions for safe handling:
Observe conventional hygiene precautions.
Do not disassemble, crush or puncture battery.
Do not overcharge or over discharge the battery.
Do not mix batteries of varying types or sizes.
Do not connect (short circuit) positive and negative terminals or place the batteries on conductive metal.
See section 2 for further details.
Technical measures:
Ensure adequate ventilation.
No special measures required.
Do not expose battery or cell to extreme temperatures or fire.
- 7.2. Conditions for safe storage, including any incompatibilities:
Technical measures and storage condition:
Handle containers carefully to prevent damage and spillage.
Insulate positive and negative terminals, when not in use, to avoid short circuit. Ensure sufficient clearance between batteries and other surfaces.
Store in a dry, cool (25°C +/-5°C, 10-50% RH) and well-ventilated area.
Elevated temperatures can result in reduced battery life and venting of flammable liquid and gases.
Keep batteries away from strong oxidizers and acids.
Keep out of reach of children.
See section 2 for further details.
Incompatible materials: see section 10.5.
Packaging material: no special prescriptions.
- 7.3. Specific end use(s):
No specific instructions available.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1. Control parameters:

Occupational exposure limit values:
Copper (as Cu) – CAS : 7440-50-8 :
Fume : Occupational Exposure Limit Value (8-hour reference period) : 0.2 mg/m³
Dusts and mists (as Cu) : Occupational Exposure Limit Value (8-hour reference period) : 1 mg/m³

Aluminium Metal – CAS: 7429-90-5Total Inhalable Dust: 10 mg/m³Respirable Dust : 4 mg/m³Welding Fume : 5 mg/m³

DNEL		Routes of exposure	Exposure frequency:	Remarks:
Worker	Consumer			
no data available	no data available	Dermal	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Inhalative	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Oral	Short term (acute) Long term (repeated)	no data available

PNEC			Exposure frequency:	Remarks:
Water	Soil	Air		
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available

8.2. Exposure controls:

In case of a hazardous material with no controlled concentration limit it is the employer's duty to keep concentration levels down to a minimum achievable by existing scientific and technological means, where the hazardous substance poses no harm to workers.

8.2.1. Appropriate engineering controls:

In pursuance of work is proper foresight needed to avoid spilling onto clothes and floors and to avoid contact with eyes and skin.

Ensure adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.

8.2.2. Individual protection measures, such as personal protective equipment:

Use good personal hygiene practices.

Wash hands before eating, drinking, smoking or using toilet.

Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details.

1. Eye/face protection: Not necessary under normal use. Wear safety goggles if handling a ruptured or leaking battery cell (EN 166).
2. Skin protection:
 - a. Hand protection: Not necessary under normal use. Wear Viton rubber gloves if handling a ruptured or leaking battery cell (EN 374).
 - b. Other: Not necessary under normal use. Wear rubber apron if handling a ruptured or leaking battery cell.
3. Respiratory protection: Not necessary under normal use. In case of battery or cell rupture, use a self-contained full face respiratory mask.
4. Thermal hazards: none known.

8.2.3. Environmental exposure controls:

No specific prescription.

The requirements detailed in Section 8 assume skilled work under normal conditions and usage of the product for appropriate aims. If conditions differ from normal or work is carried out under extreme conditions an expert's advice should be sought out before deciding upon further protective measures.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES9.1. Information on basic physical and chemical properties:

Parameter	Test method:	Remarks:
1. Appearance:		cell battery, solid
2. Odour:		odourless
3. Odour threshold:		no data available*
4. pH value:		not applicable
5. Melting point/ freezing point:		not applicable

- 6. Initial boiling point and boiling range: not applicable
- 7. Flash point: not applicable
- 8. Evaporation rate: not applicable
- 9. Flammability (solid, gas): not applicable
- 10. Upper/lower flammability or explosive limits: not applicable
- 11. Vapour pressure: not applicable
- 12. Vapour density: not applicable
- 13. Relative density: no data available*
- 14. Solubility(ies): insoluble in water
- 15. Partition coefficient: n-octanol/water: no data available*
- 16. Auto-ignition temperature: not applicable
- 17. Decomposition temperature: no data available*
- 18. Viscosity: not applicable
- 19. Explosive properties: no data available*
- 20. Oxidizing properties: no data available*

9.2. Other information:

No data available.

*: The manufacturer did not carry out any tests on this parameter for the product or the results of the tests are not available at the time of publication of the data sheet.

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:
Hazardous polymerization will not occur.
- 10.2. Chemical stability:
Stable within normal temperature and general work conditions.
- 10.3. Possibility of hazardous reactions:
Hydrogen fluoride gas may be produced in reaction with water.
- 10.4. Conditions to avoid:
Avoid exposing battery to high temperatures.
Do not incinerate, deform, mutilate, crush, pierce, short circuit or disassemble.
- 10.5. Incompatible materials:
None known.
- 10.6. Hazardous decomposition products:
Combustible vapours may be released if exposed to fire.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1. Information on toxicological effects:
Acute toxicity: Based on available data, the classification criteria are not met.
Skin corrosion/irritation: Based on available data, the classification criteria are not met.
Serious eye damage/eye irritation: Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.
Germ cell mutagenicity: Based on available data, the classification criteria are not met.
Carcinogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity: Based on available data, the classification criteria are not met.
STOT-single exposure: Based on available data, the classification criteria are not met.
STOT-repeated exposure: Based on available data, the classification criteria are not met.
Aspiration hazard: Based on available data, the classification criteria are not met.
- 11.1.1. For substances subject to registration, brief summaries of the information derived from the test conducted:
No data available.
- 11.1.2. Relevant toxicological properties of the hazardous substances:
Acute toxicity:

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Lithium Iron Phosphate - (15365-14-7)	no data available	no data available	no data available	no data available	no data available
Carbon - (7440-44-0)	10000, Rat, Category: NA	no data available	no data available	64.4, Rat, Category: NA	no data available
Copper - (7440-50-8)	2500, Rat, Category: NA	>2000, Rat, Category: NA	no data available	5.11, Rat, Category: NA	no data available

Aluminum (Al) - (7429-90-5)	no data available	no data available	no data available	no data available	no data available
Ethylene carbonate - (96-49-1)	no data available	no data available	no data available	no data available	no data available
Carbonic acid, dimethyl ester - (616-38-6)	13000, Rat, Category: NA	5000, Rabbit, Category: NA	140, Rat, Category: NA	no data available	no data available
Carbonate, methyl ethyl - (623-53-0)	no data available	no data available	no data available	no data available	no data available
Polypropylene - (9003-07-0)	no data available	no data available	no data available	no data available	no data available
Phosphate(1-), hexafluoro-, lithium - (21324-40-3)	no data available	no data available	no data available	no data available	no data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

- 11.1.3. Information on likely routes of exposure:
Ingestion, inhalation, skin contact, eye contact.
- 11.1.4. Symptoms related to the physical, chemical and toxicological characteristics:
No data available.
- 11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:
No data available.
- 11.1.6. Interactive effects:
No data available.
- 11.1.7. Absence of specific data:
No information.
- 11.1.8. Other information:
No data available.

SECTION 12: ECOLOGICAL INFORMATION

- 12.1. Toxicity:
No data available about the product.
Information about the components:

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Lithium Iron Phosphate - (15365-14-7)	not available	not available	not available
Carbon - (7440-44-0)	not available	not available	not available
Copper - (7440-50-8)	0.0103, Pimephales promelas	0.0025, Daphnia magna	0.018 (72 h), Pseudokirchneriella subcapitata
Aluminum (Al) - (7429-90-5)	not available	not available	not available
Ethylene carbonate - (96-49-1)	not available	not available	not available
Carbonic acid, dimethyl ester - (616-38-6)	not available	not available	not available
Carbonate, methyl ethyl - (623-53-0)	not available	not available	not available
Polypropylene - (9003-07-0)	not available	not available	not available
Phosphate(1-), hexafluoro-, lithium - (21324-40-3)	not available	not available	not available

- 12.2. Persistence and degradability:
No data available.
- 12.3. Bioaccumulation potential:
Not measured.
- 12.4. Mobility in soil:
No data available.

- 12.5. Results of PBT and vPvB assessment:
This product contains no PBT/vPvB chemicals.
- 12.6. Other adverse effects:
No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

- 13.1. Waste treatment methods:
Disposal according to the local regulations.
- 13.1.1. Information regarding the disposal of the product:
Recycling is encouraged. Do NOT dump into sewage or water bodies. Discharge batteries fully and cap terminals before disposal. Handle according to Section 7 and Section 8 to minimize exposure. Observe all federal, state and local regulations when disposing of this substance.
European Waste Code:
For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The European waste code number has to be determined after a discussion with a specialist dealing with waste disposal.
- 13.1.2. Information regarding the disposal of the packaging:
Dispose according to the relevant regulations.
The contaminated packaging must be fully emptied. The emptied packaging can only be sent to recycling after proper cleaning. The uncleaned packaging has to be disposed in the same manner as the product.
- 13.1.3. Physical/chemical properties that may affect waste treatment options shall be specified:
None known.
- 13.1.4. Sewage disposal:
None known.
- 13.1.5. Special precautions for any recommended waste treatment:
No data available.

SECTION 14: TRANSPORT INFORMATION

- 14.1. UN Number:
Lithium battery only: UN 3480
Lithium battery packed with lane machine: UN 3481
- 14.2. UN proper shipping name:
Lithium battery only: LITHIUM ION BATTERIES
Lithium battery packed with lane machine: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT
- 14.3. Transport hazard class(es):
Lithium battery only:
IMDG:
Class: 9
ICAO/IATA:
Class: 9
Packing Instruction: 965 (Sec. IA)
Additional instructions: cargo aircraft only
Lithium battery packed with lane machine:
IMDG:
Class: 9
ICAO/IATA:
Class: 9
Packing Instruction: 966 (Sec. I)
Additional instructions: cargo aircraft only
- 14.4. Packaging group:
None.
- 14.5. Environmental hazards:
Marine pollutant: no.
- 14.6. Special precautions for user:

Notes: The Battery Cells listed in Section 1 are designed to comply with standard international shipping regulations including the UN Recommendations on the Transport of Dangerous Good; the IATA Dangerous Goods Regulations; the International Maritime Dangerous Goods Code; and the US DOT Regulations for the safe transportation of lithium batteries. As required by the regulation directives, the cells have passed the UN Manual of Test and Criteria Part III, Subsection 38.3.

- 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code:
Not applicable.

SECTION 15: REGULATORY INFORMATION

- 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:
REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

- 15.2. Chemical safety assessment: no information available.

SECTION 16: OTHER INFORMATION

Information regarding the revision of the safety data sheet: none.

Full text of the abbreviations in the safety data sheet:

DNEL: Derived no effect level. PNEC: Predicted no effect concentration. CMR effects: carcinogenicity, mutagenicity and toxicity for reproduction. PBT: Persistent, bioaccumulative and toxic. vPvB: Very Persistent, Very Bioaccumulative. n.d.: not defined. n.a.: not applicable.

Data sources:

Safety data sheet (28. 08. 2017, version 2/EN),

Methods used for the classification according to Regulation 1272/2008/EC: based on the calculation method carried out on the basis of the known hazards of the components, not considered as hazardous mixture.

Relevant H-Phrases (number and full text) of Section 2 and 3:

H225 – Highly flammable liquid and vapour.

H250 – Catches fire spontaneously if exposed to air.

H261 – In contact with water releases flammable gases.

H301 – Toxic if swallowed.

H314 – Causes severe skin burns and eye damage.

H318 – Causes serious eye damage.

H372 – Causes damage to organs <or state all organs affected, if known> through <prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.

Training advice: no data available.

This safety data sheet had been prepared on the basis of information provided by the manufacturer/supplier and conform to the relevant regulations.

The information, data and recommendations contained herein are provided in good faith, obtained from reliable sources and believed to be true and accurate as of the date issued; however, no representation is made as to the comprehensiveness of the information. The SDS shall be used only as a guide for handling the product; in the course of handling and using the product other considerations may arise or be required.

Users are cautioned to determine the appropriateness and applicability of the above information to their particular circumstances and purposes and assume all risk associated with the use of this product. It is the responsibility of the user to fully comply with local, national and international regulations concerning the use of this product.

Date of issue: 27. 09. 2017.

<http://www.msds->



Date of revision: -
Version: 1

Safety data sheet was prepared by: ToxInfo Kft.

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