Safety Data Sheet for Lithium-Ion Rechargeable Batteries

Model Numbers: 80112254, 80112214

August 31, 2023

1. Product and Company Information

Note: These batteries are not “substances" or “mixtures" according to Regulation (EC) No 1907/2006. Instead they have to be regarded as “articles' ', no substances are intended to be released during handling. Therefore, there is no obligation to supply a safety data sheet according to Regulation (EC) 1907/2006, Article 31.

Note: Exposure to hazardous ingredients is not expected with normal use. Since this product is an article pursuant to 29 CFR 1910.1200, it is not technically subject to the OSHA Hazard Communication Standard requirement. Therefore, information contained in this Safety Data Sheet is presented to product users to ensure safe handling and proper use is practiced.

PRODUCT NAME: **Vanguard Commercial Flexible Battery, 7 kWh**

MANUFACTURER
Briggs and Stratton
12301 Wirth Street, Wauwatosa, WI. 52333

Emergency Contact
Chemtrec: # 800 424-9300

Model Number	Nominal Voltage	Nominal Capacity	Li-ion Cell Configuration	Watt-Hour Rating	Weight of Unit
80112254	51.6V	97 Ah	14s20p	5.0kWh	39 kg
80112214	51.6V	135.9 Ah	14s28p	7.0kWh	47.6 kg

Remark:
The information herein is made in good faith and represents information believed to be accurate at the date of preparation. Briggs and Stratton make no warranty, neither expressed nor implied, with respect to this information and disclaims all liabilities from reliance on it.

2. Hazard Identification

This product is a Lithium ion battery, which meets the definition of an article. It should not be hazardous if used according to the recommendations of the manufacturer under recommended use conditions. No exposure hazard exists provided the battery integrity is not compromised by mishandling during use, shipping or storage. The end user should never expose this product to mechanical or electrical abuse, or store and/or operate at high temperatures. Damage to the battery as indicated above may release contents of the individual cells comprising the battery pack. In this instance some of the materials released may be hazardous.

Hazard Summary of intact battery pack:

Physical hazards: Not classified for physical hazards.
Health hazards: Not classified for health hazards.
Environmental hazards: Not classified for hazards to the environment.
Specific hazards: No exposure or hazards is expected to occur on an intact battery**.**

Hazardous Materials Information Label (HMIS)
Health: 0
Flammability: 1
Physical Hazard: 0

NFPA Hazard Ratings
Health: 0
Flammability: 1
Reactivity: 0
Unique Hazard: NA

GHS Precautions (Intact Battery):

P102: Keep out of reach of children.
P103: Read label prior to use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat/sparks/open flames/hot surfaces
P234: Keep only in original container.
P254: Wash hands thoroughly after handling.

Damaged Battery:

P260: Avoid Breathing vapor or spray.
P280: Wear proper PPE to protect eyes and skin.
P301/330/331: IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P303/361/353: IF ON SKIN (or hair): Remove all contaminated clothing, and rinse skin with water.
P304/340: If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310: Immediately call a POISON CENTER or doctor/physician.
P363: Wash contaminated clothing before reuse.
P370: In case of fire: Use carbon dioxide, dry chemical of water extinguisher.

Exposure to contents of an open or damaged cell or battery: may result in exposure to the hydrocarbon based electrolyte. Contact with the electrolyte material may cause burns skin, eyes and mucous membranes. May cause sensitization by skin contact.

Main Symptoms: Symptoms include itching, burning, redness and tearing.
Storage : Store as indicated in Section 7

Disposal: Dispose of any spills contents generated by cell damage in accordance with all applicable Federal state and local regulations
Health Effect(s):

Acute (short term): see section 8 for exposure controls.
In the case of cell rupture and release of the corrosive electrolyte solution burns to skin and eyes are possible.
Inhalation: Inhalation of vapors or mists from a ruptured cell may cause respiratory irritation. **Ingestion:** Ingestion of the contents of an open cell can cause serious chemical burns to mouth, esophagus, and the gastrointestinal tract.
Skin: Skin contact with the electrolyte from a ruptured cell can cause irritation or burns to the skin.
Eye: Eye contact with the contents of an open cell can cause severe irritation or burns to the eye.

CHRONIC (long term): see Section 11

Interactions with other chemicals: Immersion in high conductivity liquids may cause corrosion and breaching of the cell or battery enclosure. The electrolyte solution inside of the cells may react with alkaline (basic) materials to present a flammability hazard.
Potential Environmental Effects: Not expected

3. Composition Information Hazardous Constituents

Hazardous Constituents Battery Packs	%	CAS Number
Aluminum Foil	2-10	7429-90-5
Cobalt Lithium Manganese Oxide	0-80	182442-95-1
Styrene-Butadiene-Rubber	<1	9003-55-8
Polyvinylidene Fluoride (PVDF)	<5	24397-79-9
Copper Foil	2-10	7440-50-8
Carbon (Proprietary)	10-30	7440-44-0
Electrolyte (Proprietary)	10-20	21324-40-3
Nickel	<1	7440-02-0
Steel	Remainder	65997-19-5

4. First Aid Measures

*Proprietary
†May contain Lithium Hexafluorophosphate and Ethylene Carbonate
NOTE: Equivalent Lithium Content 1.17g per cell
The hazardous components of this battery are contained within the sealed unit. Therefore, under normal conditions of use no exposure to hazardous constituents is expected. However, in rare cases exposure can occur if the battery and its internal components are damaged by exposure to high temperatures, mechanical (physical abuse), or electrical abuse. The hazardous contents are hydrocarbon-based electrolytes contained in cells which contain Lithium Hexafluorophosphate and various anode and cathode materials.

Ingestion: Have victim rinse mouth thoroughly with water. **DO NOT INDUCE VOMITING.** Quickly transport victim to an emergency care facility.

Eye: If eye contact with contents of an open cell occurs, immediately flush the contaminated eye(s) with water. Quickly transport victim to an emergency care facility.

Skin Contact: The hydrocarbon-based electrolyte can cause skin irritation. If the solution contacts the Skin, flush with copious amounts of water. If irritation or pain persists, seek medical attention.

First Responders: Avoid entering areas which may have corrosive vapors without adequate PPE such as an Air-Supplied Respirator. See section 8 for addition personal protection equipment recommendations.

First Aid Facilities: We recommend immediate access to water is available near battery handling and storage areas. This may consist of eye wash bottles, eye wash stations, or safety shower, but at minimum, a source of running water should be nearby.

Acute and Chronic Symptoms:

Acute: Subsequent to release of electrolyte, ingestion of the electrolyte could lead to severe gastrointestinal tract irritation with nausea, vomiting and potentially burns. Inhalation of vapors may cause irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in both the nose and throat. In some exposures coughing or difficulty breathing may be experienced. Eye contact may lead to severe eye irritation. Skin contact may lead to irritation and possible skin burns.

Chronic: Skin contact may exacerbate existing skin conditions, such as dermatitis, whereas chronic inhalation may lead to the same symptoms as listed for acute inhalation above.

Advice to Doctor: Treat symptomatically if the person comes into contact with the corrosive electrolyte liquid contents of a damaged battery.

5. Fire Fighting Measures

If cells are damaged within the pack a suitable extinguishing media should be used (e.g. dry sand) to extinguish the fire. Care must be taken to cool the pack so that fire does not propagate within the pack. Water should be used to cool the pack.

There is potential for formation of Hydrogen Fluoride, Carbon monoxide, and carbon dioxide to form from electrolyte contact with water.

First Responders should wear self-contained breathing apparatus and a protective suit which prevents contact of electrolyte with skin.

Additional information:

If possible, remove batteries (and cells) from fire-fighting area. If heated above 125°C, batteries (and cells) can explode/vent.

6. Accidental Release Measures

Recommended personal protective equipment and emergency procedures:

Isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind and as vapors tend to be heavier clear of low-lying areas. Ventilate closed areas before entering. Wear adequate personal protective equipment as indicated in Section 8.

Environmental precautions:

Absorb spilled material with non-reactive absorbent such as vermiculite, clay or earth. Prevent from migration into soil, sewers and natural waterways – inform local authorities if this occurs.

Evacuate spill area immediately and remove sources of ignition. Do NOT touch spilled material.

Cleanup personnel must be trained in the safe handling of this product. Spills may be absorbed on non reactive absorbents (clay-based sorbents, Vermiculite etc.) Place cells or batteries into individual plastic bags and then place into appropriate containers and close tightly for disposal. Dispose of in accordance with applicable local, state and Federal regulations.

7. Handling and Storage

Store these units so as to prevent mechanical damage of the Battery/cells. Do not open or disassemble. Always store these units away from open flames, heating units and other sources of heat. Units should be

stored at room temperature (approx. 20°C) at a state of charge of approx. 30% of the nominal capacity preferably in a dry and well-ventilated area. Storage at higher temperature can in certain condition affect the longevity of the battery.

8. Exposure Controls/Personal Protection

Exposure Limit Values: Airborne releases of hazardous substances are not expected when the cells or batteries are used for their intended purposes. Therefore exposure standards only apply to damaged cells and not to the sealed articles.

Biological Monitoring: Not applicable.
Recommended monitoring procedures: Follow standard monitoring procedures.
Derived no-effect level (DNEL): Not applicable.
Derived minimal effect level (DMEL): Not applicable.
Predicted no-effect concentrations (PNECs): Not applicable

Engineering Controls: No special ventilation is required during the normal use of this product. Ventilation is required only if leakage from the battery/cell is detected.

Personnel Protection Recommendations:

Respiratory protection: During normal handling, storage and use a respirator is not required. However, if leakage of the electrolyte is detected possible vapors which are irritating in nature can be released. In that instance an approved use of SCBA is recommended.

Eye and Face protection: Eye protection is not normally required during routine storage, usage and handling. ANSI/ISO approved safety glasses should be worn when handling batteries/cells that are leaking or damaged.

Skin protection: No special hand protection is required during normal use. The appropriate chemically resistant gloves are recommended when exposure to electrolyte is possible. Skin protection is not required when handling the cell or battery during normal use. Long-sleeved clothing should be used to prevent skin contact if handling a leaking or ruptured cell or battery.

Thermal Protection: Not applicable.

9. Physical and Chemical Properties

Physical State: The Battery Pack is physically solid
Odor: Odorless

Environmental Health and Safety Information:
pH Value: NA
Flash point: NA

Lower explosion limits: Not Applicable to the battery pack. In the event of cell rupture adequate ventilation should negate L.E.L as an issue
Vapor pressure: NA
Density: NA
Water solubility: Insoluble
Ignition temperature: NA

10.Stability and Reactivity

Section X – STABILITY AND REACTIVITY USA, EU

Stability: The battery pack is stable under normal use conditions
The user should ensure the battery pack is kept away from open flames, hot surfaces and ignition sources. Never puncture or crush the battery.
Hazardous decomposition products
In the event a cell is damaged there is the possibility of hydrofluoric acid and carbon monoxide release.

11.Toxicological Information

Normal use:
The hazardous constituents of the cell or battery are contained within the sealed cells. No exposure to these constituents is expected during normal use conditions. Care should be taken to ensure the structural integrity of the cells remains uncompromised and is not exposed to high temperature or mechanical, electrical or physical abuse.

If exposure to electrolyte occurs due to damage of the cell the following toxicological concerns may be present:

Acute Toxicity:

Ingestion: During normal usage ingestion should not occur. However, if the cell contents are breached through damage, ingestion of this electrolyte may result in nausea, vomiting, diarrhea, and abdominal pain.

Eye: The electrolyte contained within the cell or battery may cause damage to the eyes. Correct handling procedures incorporating appropriate eye protection should minimize the risk.

Skin: The electrolyte contained within the cells may cause skin burns or severe irritation to the skin if not washed off immediately. Correct handling procedures should minimize the risk of skin irritation.
Inhaled: Inhalation of vapors from a leaking cell or battery may cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

Skin Corrosion/Irritation: The electrolyte contained within the cell or battery may cause Dermal

Corrosivity/Irritation.

Serious Eye Damage/Irritation: The electrolyte contained within the cell or battery may cause eye damage.

Germ Cell Mutagenicity: The electrolyte contained within the cell or battery is not expected to be mutagenic according to test such as OECD tests 471, 475, 476, 478 and 479, based on the available data and the known hazards of the components.

Carcinogenicity: The electrolyte contained within the cell or battery is not expected to be a carcinogen. The cathode contains Cobalt and Nickel components. These components are classified as IARC 2B – possibly carcinogenic to humans, however they do not pose a threat when contained in the cell or battery sealed unit.

Electrolyte Information:

Ethylene Carbonate: CAS-No 96-49-1 Synonyms 1, 3-Dioxolan-2-one

pH: 7 at 200 g/l 68 °F (20 °C)
Melting point: 36 °C
Boiling point/boiling range: 478 °F (248 °C) at 1,013 hPa
Flash point: 289 °F (143 °C) Method: DIN 51758
Evaporation rate: No information available.
Flammability: No information available.
Lower explosion limit: 3.6 %(V)
Upper explosion limit: 16.1 %(V)
Vapor pressure: 0.21 hPa at 68 °F (20 °C)
Relative vapor density: No information available.
Density: 1.32 g/cm³ at 104 °F (40 °C)
Relative density: No information available.

Corrosive to metals, category 1
Skin corrosion, categories 1A, 1B, 1C
serious eye damage, category 1

GHS05

Lithium Hexafluorophosphate: May be present dependent on battery type

Acute toxicity (oral, dermal, inhalation), category 4
Skin irritation, category 2
Eye irritation, category 2
Skin sensitization, category 1

GHS07

Specific Target Organ Toxicity – Single exposure, category 3

GHS08

Respiratory sensitization, category 1
Germ cell mutagenicity, categories 1A,1B,2
Carcinogenicity, categories 1A,1B,2
Reproductive toxicity, categories 1A,1B,2
~~Specific Target Organ Toxicity – Single exposure,~~ categories 1,2

Specific Target Organ Toxicity – Repeated exposure, categories 1,2

Aspiration Hazard, category 1

12.Ecological Information

Environmental Hazards: are not known or expected under normal use. In the event of any cell breach of damage to the unit, do not flush contents of cell into surface water or sanitary sewer systems

13.Disposal Considerations

Recycling: The recycling of spent batteries is strongly encouraged.

Contaminated packaging: Dispose of used product in accordance with all local, state and Federal regulations.

14.Transport Information

The shipper should transport these units in accordance with all applicable regulations. Regulations and shipping and packaging requirements may vary dependent on mode of transportation. Therefore, Briggs and Stratton does not represent to its customers as to how best to transport these or any units as these products may be incorporated in various machinery or vehicles which can alter shipping descriptions, packaging requirements, etc. However the following represents proper shipping names and description in general for these battery packs as sold. This information is accurate to the best of our knowledge as of March 2021. If the batteries are shipped in or with equipment, a different UN classification code should be used.

Suggested Resources for shippers:

	USA	*Sea*	*Air*	*Road*	*Rail*
Regulations	49CFR	IMDG	IATA-DGR	ADR	RID
UN-number	3480	3480	Not Allowed	3480	3480
Proper Shipping Name	Lithium Ion Batteries	Lithium Ion Batteries		Lithium Ion Batteries	Lithium Ion Batteries
Class	9	9		9	9
Hazard label					
Environment	Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No		Dangerous for the environment: No	Dangerous for the environment: No

Domestic Shipping (USA):

Consult the US Hazardous Materials Regulations at 49 CFR (Code of Federal Regulations), specifically Sections 173.185 Lithium batteries and cells.

UN Classification Code : UN 3480
Proper Shipping Name : Lithium Ion Batteries
Packing Group : None
Hazard Class : 9

Ground Shipping (EU):
Consult the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (2019 Edition).

UN Classification Code : UN 3480
Name and Description : Lithium Ion Batteries Class : 9,
Packing Group : None

Labels and Placards :
Special Provisions : 230, 310, 348, 376, 377 Excepted Quantities : Not allowed
Limited Quantities : Not allowed
Packing Instructions : P903, P908, P909, P910 Special Packing Provisions : None
Mixed Packing Provisions : None
Transport Category / Tunnel Restriction Code : 2 / E
Special Provisions for Carriage – Packages : None
Special Provisions for Carriage – Loading and Unloading : None
Special Provisions for Carriage – Operation : None
Hazard Identification Number : None

Vessel Transportation:

Consult the International Maritime Dangerous Goods (IMDG) Code (2018 Edition)

UN Classification Code : UN 3480
Name and Description : Lithium Ion Batteries Class : 9
Packing Group : None

Labels and Placards :
Special Provisions : 230, 310, 348, 376, 377 Excepted Quantities : Not allowed
Limited Quantities : Not allowed
Packing Instructions : P903, P908, P909, P910

Air Transportation:
Per the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA), lithium battery packs with a net weight greater than 35 kg cannot be transported aboard cargo aircraft.

In the event these lithium-ion batteries are packed with or contained in equipment the shipper is responsible for ensuring that the consignment is packed and shipped in accordance with all applicable regulations.

We further certify that this product has been tested and met all requirements and conditions in accordance with UN Recommendations on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria (38.3 Lithium Batteries)

15.Regulatory Information

Canadian Federal Regulations:
These products have been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.
WHMIS Classification: Not Controlled, manufactured article.
New Substance Notification Regulations: Lithium hexafluorophosphate is listed on the Non-Domestic Substance List (NDSL). All other ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL).
National Pollutant Release Inventory (NPRI) Substances: These products do not contain any NPRI chemicals.
California Prop 65: This battery contains cobalt which is regulated under California Proposition 65. Products containing this battery may be subject to OEHHA warning requirements.

United States Federal and State Regulations:
TSCA Status: All ingredients in these products are listed on the TSCA inventory.
OSHA: These products do not meet criteria as per Part 1910.1200, manufactured article.

SARA EPA Title III: None.
Sec. 302/304: None.
Sec. 311/312: None.
Sec. 313: None.
CERCLA RQ: None.

EC Classification for the Substance/Preparation:
These products are not classified as hazardous according to Regulation (EC) No. 1272/2008.
Keep out of the reach of children.

EU Restrictions on use:
Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended: Aluminum (CAS 7429-90-5)
Other EU Regulations
This Safety Data Sheet complies with the requirements of Regulation (EC) No. 1907/2006.

16.Other Information

Prepared By: Briggs and Stratton Compliance Department

Date: August 31, 2023

The information presented on this Safety Data Sheet is accurate to the best of our knowledge and information at the time of its publication. This is a document prepared for our customers use to offer guidance on storage, handling and use of our product.