

SAFETY DATA SHEET

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NGHS / English



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1. IDENTIFICATION

Product identifier

Product Name ONEPWR 3.0AH BATTERY

Other means of identification

Product Code(s) 1508456

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Identification TTi Floorcare

Address 8501 IBM DR.
Charlotte
NC
28262
US

Telephone Phone:888-321-1134
Fax:440-996-2026

E-mail Valinda.Griggs@ttifloorcare.com

Emergency telephone number

Company Emergency Phone Number 888-321-1134

2. HAZARDS IDENTIFICATION

Classification

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1



Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

This is a battery. In case of rupture: the above hazards exist.

Appearance Solid

Physical state Solid

Odor Odorless

GHS Label elements, including precautionary statements

Danger

Hazard statements

Harmful if swallowed

Toxic in contact with skin

Causes severe skin burns and eye damage

Suspected of causing cancer

Causes damage to organs through prolonged or repeated exposure



Precautionary Statements - Prevention

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Wear protective gloves/protective clothing/eye protection/face protection

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Do not breathe dust/fume/gas/mist/vapors/spray

Precautionary Statements - Response

Specific treatment (see supplemental first aid instructions on this label)

Immediately call a POISON CENTER or doctor

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Immediately call a POISON CENTER or doctor

Skin

Call a POISON CENTER or doctor if you feel unwell

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower

Wash contaminated clothing before reuse

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing

Immediately call a POISON CENTER or doctor

Ingestion

IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell

Rinse mouth

Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other information

Very toxic to aquatic life with long lasting effects.

Unknown acute toxicity 99 % of the mixture consists of ingredient(s) of unknown toxicity
 80.6 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
 94 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable.

Mixture

Chemical name	CAS No.	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Graphite	7782-42-5	25	-	-
Lithium Cobalt Oxide (CoLiO ₂)	12190-79-3	24	-	-
Copper	7440-50-8	15	-	-
Aluminum	7429-90-5	10	-	-
Propylene carbonate	108-32-7	6.6	-	-
Phosphate(1-), hexafluoro-, lithium	21324-40-3	5	-	-

4. FIRST AID MEASURES

First aid measures

General advice	First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. IF exposed or concerned: Get medical advice/attention.
Inhalation	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention.
Eye contact	Get immediate medical advice/attention. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing.
Skin contact	Get immediate medical advice/attention. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination. Wear personal protective clothing (see section 8). Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.
Specific hazards arising from the chemical	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
Hazardous Combustion Products	Carbon oxides.
Explosion Data	
Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Attention! Corrosive material. Keep people away from and upwind of spill/leak.
Other Information	Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE



Precautions for safe handling**Advice on safe handling**

In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Take off contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities**Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Store locked up. Protect from moisture. Store away from other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters**Exposure Limits**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH	
Graphite 7782-42-5	TWA: 2 mg/m ³ respirable particulate matter all forms except graphite fibers	TWA: 15 mg/m ³ total dust synthetic TWA: 5 mg/m ³ respirable fraction synthetic (vacated) TWA: 2.5 mg/m ³ respirable dust natural (vacated) TWA: 10 mg/m ³ total dust synthetic (vacated) TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf natural	IDLH: 1250 mg/m ³ TWA: 2.5 mg/m ³ respirable dust	
Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3	TWA: 0.02 mg/m ³	-		
Copper 7440-50-8	TWA: 0.2 mg/m ³ fume	TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ dust and mist (vacated) TWA: 0.1 mg/m ³ Cu dust, fume, mist	IDLH: 100 mg/m ³ dust, fume and mist TWA: 1 mg/m ³ dust and mist TWA: 0.1 mg/m ³ fume	
Aluminum 7429-90-5	TWA: 1 mg/m ³ respirable particulate matter	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction	TWA: 10 mg/m ³ total dust TWA: 5 mg/m ³ respirable dust	
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA: 2.5 mg/m ³ F	TWA: 2.5 mg/m ³ F (vacated) TWA: 2.5 mg/m ³	IDLH: 250 mg/m ³ F	
Chemical name	Alberta	British Columbia	Ontario TWAEV	Quebec
Graphite 7782-42-5	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³
Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³
Aluminum 7429-90-5	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 1.0 mg/m ³	TWA: 1 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³

Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³
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Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Face protection shield.

Hand protection Wear suitable gloves. Impervious gloves.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical state Solid
Appearance Solid
Odor Odorless
Color No information available
Odor Threshold No information available

<u>Property</u>	<u>Values</u>	<u>Remarks Method</u>
pH	No data available	None known
Melting / freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	No data available	None known
Evaporation Rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air	No data available	None known
Upper flammability limit	No data available	
Lower flammability limit	No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Relative density	No data available	None known
Water Solubility	Insoluble in water	
Solubility(ies)	No data available	None known
Partition coefficient: n-octanol/water	Not Available	
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known



Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known

Other Information

Explosive properties	No information available
Oxidizing properties	No information available
Softening Point	No information available
Molecular Weight	No information available
VOC Content (%)	No information available
Liquid Density	No information available
Bulk Density	No information available
Particle Size	No information available
Particle Size Distribution	No information available

10. STABILITY AND REACTIVITY

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous Polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Exposure to air or moisture over prolonged periods.
Incompatible materials	Acids. Bases. Oxidizing agent.
Hazardous Decomposition Products	Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information	Product does not present an acute toxicity hazard based on known or supplied information In case of rupture:
Inhalation	Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.
Eye contact	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.
Skin contact	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. Toxic in contact with skin.
Ingestion	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Information on toxicological effects

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Numerical measures of toxicity

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 1,778.60 mg/kg
ATEmix (dermal) 360.00 mg/kg

Unknown acute toxicity 99 % of the mixture consists of ingredient(s) of unknown toxicity
 80.6 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
 94 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
 99 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Propylene carbonate	= 29000 mg/kg (Rat)	> 3000 mg/kg (Rabbit)	-

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes burns.
Serious eye damage/eye irritation Classification based on data available for ingredients. Risk of serious damage to eyes. Causes burns.
Respiratory or skin sensitization No information available.
Germ cell mutagenicity No information available.
Carcinogenicity Contains a known or suspected carcinogen. Classification based on data available for ingredients. Suspected of causing cancer.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	A3	Group 2B	Reasonably Anticipated	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
 A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
 Group 2B - Possibly Carcinogenic to Humans
NTP (National Toxicology Program)
 Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
 X - Present

Reproductive toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure.



Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Chemical name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Copper	96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.8 mg/L (Cyprinus carpio)	-	48h EC50: = 0.03 mg/L
Propylene carbonate	72h EC50: > 500 mg/L (Desmodesmus subspicatus)	96h LC50: > 1000 mg/L (Cyprinus carpio) 96h LC50: = 5300 mg/L (Leuciscus idus)	EC50 > 10000 mg/L 17 h	48h EC50: > 500 mg/L

Persistence and Degradability No information available.

Bioaccumulation

Component Information

Chemical name	Log Pow
Propylene carbonate	0.48

Mobility No information available.

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

California Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.



Chemical name	California Hazardous Waste
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	Toxic
Copper 7440-50-8	Toxic
Aluminum 7429-90-5	Ignitable powder

14. TRANSPORT INFORMATION

Note: The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule)
Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

DOT NOT REGULATED
Proper Shipping Name NON REGULATED
Hazard Class N/A
Emergency Response Guide Number 147

TDG Not regulated

MEX Not regulated

ICAO Not regulated

IATA Not regulated
Proper Shipping Name NON REGULATED
Hazard Class N/A

IMDG/IMO Not regulated
Hazard Class N/A
EmS-No. F-A, S-I

RID Not regulated

ADR Not regulated

ADN Not regulated

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

International Regulations

Ozone-depleting substances (ODS) Not applicable



Persistent Organic Pollutants Not applicable

Export Notification requirements Not applicable

International Inventories

TSCA	Contact supplier for inventory compliance status.
DSL/NDSL	Contact supplier for inventory compliance status.
EINECS/ELINCS	Contact supplier for inventory compliance status.
ENCS	Contact supplier for inventory compliance status.
KECL	Contact supplier for inventory compliance status.
PICCS	Contact supplier for inventory compliance status.
AICS	Contact supplier for inventory compliance status.

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	CAS No.	Weight-%	SARA 313 - Threshold Values %
Lithium Cobalt Oxide (CoLiO ₂) - 12190-79-3	12190-79-3	24	0.1
Copper - 7440-50-8	7440-50-8	15	1.0
Aluminum - 7429-90-5	7429-90-5	10	1.0

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Copper 7440-50-8		X	X	

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

US State Regulations



California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product may contain substances regulated by state right-to-know regulations.

Chemical name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Graphite 7782-42-5	X	X	X		
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	X		X	X	X
Copper 7440-50-8	X	X	X	X	X
Aluminum 7429-90-5	X	X	X	X	
Phosphate(1-), hexafluoro-, lithium 21324-40-3	X				

16. OTHER INFORMATION

NFPA	Health hazards 1	Flammability 0	Instability 0	Physical and Chemical Properties -
HMIS	Health hazards 0	Flammability 0	Physical hazards 0	Personal Protection X

Prepared By Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

Revision Date 16-Apr-2019

Revision Note No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet



Material Safety Data Sheet

1. Product and Company Identification

Important Note: As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use. This battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Material Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Commercial product name

INR18650-30Q

Use of the substance/preparation

Lithium-Ion battery

Manufacturer

SAMSUNG SDI Co., LTD

Address

HQ: 150-20, Gongse-ro, Giheung-gu, Yongin-si, Gyeonggi-do, Korea

Company/undertaking identification

Emergency Contact(Chemtrec)

1-800-424-9300: US and Canada / 1-703-527-3887: International

Further Information

Battery-System: Lithium-Ion (Li-ion)

Nominal Voltage: 3.6 V

Rated Capacity: 3.0 Ah

Wh rating: 10.8 Wh

Anode (negative electrode): based on intercalation graphite

Cathode (positive electrode): based on lithiated metal oxide (Cobalt, Nickel, Manganese)

Remark:

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Co., Ltd. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

2. Hazards Identification

Route(s) of Entry

There is no hazard when the measures for handling and storage are followed.

Signs and Symptoms of Exposure

In case of cell damage, possible release of dangerous substances and a flammable gas mixture.



OSHA Hazard Communication: This material is not considered hazardous by the OSHA Hazard Communication Standard 29CFR 1910.1200.

Carcinogenicity (NTP): Not listed
 Carcinogenicity (IARC): Not listed
 Carcinogenicity (OSHA): Not listed

Special hazards for human health and environment

There is no hazard when the measures for handling and storage are followed.
 In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

3. Composition/information on ingredients

Hazardous components

CAS-No.	Chemical name	Quantity
24937-79-9	1,1-Difluoroethene homopolymer	< 1%
96-49-1	1,3-Dioxolan-2-one	< 2%
25640-14-6	1,4-Benzenedicarboxylic acid dimethyl ester polymer with 1,4-cyclohexanedimethanol and 1,2-ethanediol	< 1%
36619-23-5	1,4-Benzenedicarboxylic acid, dimethyl ester, polymer with 1,3-propanediol	< 1%
25038-81-7	1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone polymer with 4,4'-oxybis[benzenamine]	< 1%
872-50-4	1-Methyl-2-pyrrolidinone	< 1%
9003-07-0	1-Propene homopolymer	< 1%
9010-94-0	2-Methyl-2-propenoic acid methyl ester polymer with 1,3-butadiene, ethenylbenzene and 2-propenenitrile	< 1%
9010-93-9	2-Methyl-2-propenoic acid polymer with 1,3-butadiene and ethenylbenzene	< 1%
88254-10-8	2-Propenenitrile polymer with 1,3-butadiene, hydrogenated	< 1%
35239-19-1	2-Propenoic acid polymer with butyl 2-propenoate, ethenyl acetate and 2-ethylhexyl 2-propenoate	< 1%
114435-02-8	4-Fluoro-1,3-dioxolan-2-one	< 2%
26337-35-9	Acetic acid ethenyl ester polymer with carbon monoxide and ethene	< 1%
24937-78-8	Acetic acid ethenyl ester polymer with ethene	< 1%
7429-90-5	Aluminium	< 7%
11089-89-7	Aluminum lithium oxide (LiAlO)	< 1%
8052-42-4	Asphalt	< 1%
1318-23-6	Boehmite (Al(OH)O)	< 1%
110-61-2	Butanedinitrile	< 1%
7440-44-0	Carbon	< 12%



1333-86-4	Carbon black	< 1%
9004-32-4	Cellulose, carboxymethyl ether, sodium salt	< 1%
12190-79-3	cobalt lithium dioxide	< 4%
7440-50-8	Copper	< 12%
616-38-6	dimethyl carbonate	< 5%
100-41-4	ethylbenzene	< 1%
7782-42-5	Graphite	< 5%
26023-21-2	imide resin	< 1%
7439-89-6	Iron	< 13%
554-13-2	lithium carbonate	< 1%
21324-40-3	lithium hexafluorophosphate(1-)	< 2%
12325-84-7	Lithium Nickel Oxide	< 31%
14283-07-9	lithium tetrafluoroborate, anhydrous	< 1%
244761-29-3	Lithium-bis-oxaiatoborate	< 1%
7439-95-4	Magnesium	< 1%
7439-96-5	Manganese	< 1%
108-38-3	m-xylene	< 1%
7440-02-0	Nickel	< 1%
16812-54-7	Nickel monosulfide	< 1%
95-47-6	o-xylene	< 1%
24968-12-5	poly(1,4-butylene terephthalate)	< 1%
9002-88-4	Polyethylene	< 2%
106-42-3	p-xylene	< 1%
7440-21-3	Silicon	< 1%
9003-55-8	Styrene, butadiene copolymer	< 1%
14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	< 1%
13463-67-7	titanium dioxide	< 1%

Full text of each relevant R phrase can be found in heading 16.

Further Information

For information purposes:

(*) Main ingredients: Lithium hexafluorophosphate, organic carbonates

Because of the cell structure the dangerous ingredients will not be available if used properly.
 During charge process a lithium graphite intercalation phase is formed.

Mercury content: Hg < 0.1mg/kg

Cadmium content: Cd < 1mg/kg
Lead content: Pb < 10mg/kg

4. First Aid Measures

General information

The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

After inhalation

Ensure of fresh air. Consult a physician.

After contact with skin

In case of contact with skin wash off immediately with plenty of water. Consult a physician.

After contact with eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical treatment by eye specialist.

After ingestion

Drink plenty of water.

Call a physician immediately.

5. Fire Fighting Measures

Suitable extinguishing media

Cold water and dry powder in large amount are applicable.

Use metal fire extinction powder or dry sand if only few cells are involved.

Special hazards arising from the chemical

May form hydrofluoric acid if electrolyte comes into contact with water.

In case of fire, the formation of the following flue gases cannot be excluded:

Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide.

Protective equipment and precautions for firefighters

Wear self-contained breathing apparatus and protective suit.

Additional information

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

6. Accidental Release Measures

Personal precautions

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up/taking up



Take up mechanically and send for disposal.

7. Handling and Storage

Handling

Advice on safe handling

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage rooms and vessels

Storage at room temperature (approx. 20°C) at approx. 20~60% of the nominal capacity (OCV approx. 3.6 - 3.9 V/cell).

Keep in closed original container.

8. Exposure controls/personal protection Exposure limit values Exposure limits

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt oxide	R22;R43; R50/53	S24;S37;S60;S61	Xn(Harmful) N (Dangerous for the environment)	0.1 mg/m3 (TWA)
Manganese (VI) oxide	R20/22	S25	Xn(Harmful)	Airborne Exposure Limits: - OSHA Permissible Exposure Limit (PEL): 5 mg/m3 Ceiling for manganese compounds as Mn - ACGIH Threshold Limit Value (TLV): 0.2 mg/m3 (TWA) for manganese, elemental and inorganic compounds as Mn
Nickel oxide	R43,R49, R53	S45,S53,S61	T(Toxic)	Airborne Exposure Limits: For Nickel, Metal and Insoluble Compounds, as Ni: - OSHA Permissible Exposure Limits (PEL) - 1 mg/m3 (TWA). For Nickel, Elemental / Metal: - ACGIH Threshold Limit Value (TLV) - 1.5 mg/m3 (TWA), A5 - Not suspected as a human carcinogen. For Nickel, Insoluble Compounds, as Ni: - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m3 (TWA), A1 - Confirmed human carcinogen



Carbon	R36/37/38, R36/37 R20, R10	S22;S24/25	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	Airborne Exposure Limits: - OSHA Permissible Exposure Limits (PELs): activated carbon (graphite, synthetic): Total particulate = 15 mg/m ³
Aluminium foil	R17,R15, R36/38, R10,R67, R65,R62, R51/53, R48/20, R38,R11,	S7/8,S43,S26,S62 ,S61, S36/37, S33,S29,S16,S9	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	Airborne Exposure Limits: -OSHA Permissible Exposure Limit (PEL): 15 mg/m ³ (TWA) total dust and 5 mg/m ³ (TWA) repairable fraction for Aluminum metal as Al -ACGIH Threshold Limit Value (TLV): 10 mg/m ³ (TWA) Aluminum metal dusts
Copper foil	R11 R36 R37 R38	S5,S26,S16,S61, S36/37	F(Highly Flammable) N(Dangerous for the environment) Xn(Harmful) Xi(Irritant)	Copper Dust and Mists, as Cu: - OSHA Permissible Exposure Limit (PEL) - 1 mg/m ³ (TWA) - ACGIH Threshold Limit Value (TLV) - 1 mg/m ³ (TWA) Copper Fume: - OSHA Permissible Exposure Limit (PEL) - 0.1 mg/m ³ (TWA) - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m ³ (TWA)
Polyvinylidene fluoride (PVdF)		S22;S24/25		

Additional advice on limit values

During normal charging and discharging there is no release of product.

Occupational exposure controls

No specific precautions necessary.

Protective and hygiene measures

When using do not eat, drink or smoke. Wash hands before breaks and after work.

Respiratory protection

No specific precautions necessary.

Hand protection

No specific precautions necessary.

Eye protection

No specific precautions necessary.

Skin protection

No specific precautions necessary.

9. Physical and Chemical Properties

Appearance

Form: Solid

Color: Various
Odor: Odourless

Important health, safety and environmental information

Test method

pHValue:	n.a.
Flash point:	n.a.
Lower explosion limits:	n.a.
Vapour pressure:	n.a.
Density:	n.a.
Water solubility:	Insoluble
Ignition temperature:	n.a.

10. Stability and Reactivity USA, EU

Stability

Stable

Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.

Materials to avoid

No materials to be especially mentioned.

Hazardous decomposition products

In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.

Possibility of Hazardous Reactions

Will not occur

Additional information

No decomposition if stored and applied as directed.

11. Toxicological Information

Empirical data on effects on humans

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

12. Ecological Information

Further information

Ecological injuries are not known or expected under normal use. Do not flush into surface water or sanitary sewer system.

13. Disposal Considerations

Advice on disposal



For recycling consult manufacturer.

Contaminated packaging

Disposal in accordance with local regulations.

14. Transport Information

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B or II (2015-2016 Edition),
- The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section I B or II (56th Edition, 2015)
- The International Maritime Dangerous Goods (IMDG) Code (2014 Edition), [Special provision 188, 230]
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations) Sections 173.185 Lithium batteries and cells,
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type (latest version is Revision 5, Amendment 2)
- UN No. 3480

If those lithium-ion batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods Regulations section II of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-Dangerous). If those lithium-ion batteries are packed with or contained in an equipment, UN No. is UN3481

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria.

Test results of the UN Recommendation on the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)		Test Results	Remark
No	Test item		
T1	Altitude Simulation	Pass	
T2	Thermal Test	Pass	
T3	Vibration	Pass	
T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact/Crush	Pass	
T7	Overcharge	Pass	For pack and single cell battery only
T8	Forced Discharge	Pass	

15. Regulatory Information

U.S. Regulations



National Inventory TSCA

All of the components are listed on the TSCA inventory.

SARA

To the best of our knowledge this product contains no toxic chemicals subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA/EPCRA) and the requirements of 40 CFR Part 372.

Regulatory information EU

Labeling

Hazardous components which must be listed on the label

As an article the product does not need to be labeled in accordance with EC directives or respective national laws.

EU regulatory information

1999/13/EC (VOC): 0 %

16. Other Information

Hazardous Materials Information Label (HMIS)

Health: 0

Flammability: 0

Physical Hazard: 0

NFPA Hazard Ratings

Health: 0

Flammability: 0

Reactivity: 0

Unique Hazard:

Full text of R-phrases referred to under sections 2 and 3

R10	Flammable.
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R34	Causes burns.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitization by skin contact.
R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.
R50	Very toxic to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic environment.

Further Information

Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product

(s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. "(n.a. = not applicable; n.d. = not determined)"

The data for the hazardous ingredients were taken respectively from the last version of the

SAMSUNG SDI Co., LTD
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MODEL INR18650-30Q

Revision no.: 02



SAMSUNG SDI

sub-contractor's safety data sheet.