

Safety Data Sheet

1. IDENTIFICATION




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|--|--|
| Product Name: Sealed Lead Acid Battery/ Optima Battery™ Synonyms: Sealed Lead Acid Battery | Product Use: Vehicle Electrical System Manufacturer/Supplier: Johnson Controls Battery Group Address: P.O. Box 590 Milwaukee, WI 53201 US |
| General Information Number: (800)-333-2222 ext. 3138 Contact Person: Industrial Hygiene & Safety Department | Emergency number: CHEMTREC: 800-424-9300 |

NOTE: The Johnson Controls sealed cell/battery is considered an article as defined by 29 CFR 1910.1200 (OSHA Hazard Communication Standard). The information contained in this SDS is supplied at the customer's request for information only.

2. HAZARD(S) IDENTIFICATION

| Health | | Environmental | | Physical |
|--|-------------|---------------|-----------|---------------------------------|
| Acute Toxicity (Oral, dermal, inhalation) | Category 4 | Aquatic | Chronic 1 | Explosive Chemical Division 1.3 |
| Skin corrosion/irritation | Category 1A | Aquatic | Acute 1 | |
| Eye Damage | Category 1 | | | |
| Reproductive | Category 1A | | | |
| Carcinogenicity (lead) | Category 1B | | | |
| Carcinogenicity (acid mist) | Category 1A | | | |
| Specific target organ toxicity (repeated exposure) | Category 2 | | | |

Label Elements:

| Health | Environmental | Physical |
|---|---|---|
|  |  |  |
| Hazard Statements DANGER! Causes severe skin burns and eye damage. Causes serious eye damage. May damage fertility or the unborn child if ingested or inhaled. May cause cancer if ingested or inhaled. Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure. | Precautionary Statements Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing, eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Causes skin irritation, serious eye damage. Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid. Irritating to eyes, respiratory system, and skin. | |

| | |
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| May form explosive air/gas mixture during charging. Extremely flammable gas (hydrogen). Explosive, fire, blast or projection hazard. | |
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3. COMPOSITION / INFORMATION ON INGREDIENTS

| INGREDIENTS (Chemical/Common Names): | CAS No.: | % by Wt: |
|--------------------------------------|------------|----------|
| Lead | 7439-92-1 | 63 - 91 |
| Sulfuric Acid | 7664-93-9 | 17 - 25 |
| Case Material Polypropylene | 9010-79-1 | 2 - 6 |
| Separator/Paster Paper Fibrous Glass | 65997-17-3 | <1 - 4 |

Composition Comments All concentrations are in percent by weight.

4. FIRST AID MEASURES

Note: Under normal conditions of battery use, internal components will not present a health hazard. The following information is provided for battery electrolyte (acid) and lead for exposures that may occur during battery production or container breakage or under extreme heat conditions such as fire.

| | |
|---------------------|--|
| Inhalation | Sulfuric Acid: Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician. Lead: Remove from exposure, gargle, wash nose and lips; consult physician. |
| Skin contact | Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes. If symptoms persist, seek medical attention. Wash contaminated clothing before reuse. Discard contaminated shoes. Lead: Wash immediately with soap and water. |
| Eye contact | Sulfuric Acid and Lead: Flush immediately with large amounts of water for at least 15 minutes while lifting lids; Seek immediate medical attention if eyes have been exposed directly to acid. |
| Ingestion | Sulfuric Acid: Give large quantities of water; Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death; consult physician. Lead: Consult physician immediately. |

5. FIRE FIGHTING MEASURES

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|--|--|
| Flash Point | Hydrogen – 259 °C |
| Auto ignition Temperature | Hydrogen – 580 °C |
| Flammable Limits | LEL = 4.1% (Hydrogen Gas in air) ; UEL = 74.2% |
| Extinguishing Media | CO ₂ ; foam; dry chemical. Do not use carbon dioxide directly on cells. Avoid breathing vapors. Use appropriate media for surrounding fire. |
| Special Fire Fighting Procedures | Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down. |
| Unusual Fire and Explosion Hazard | Highly flammable hydrogen gas is generated during charging and operation of batteries. If ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery. Follow manufacturer's instructions for installation and service. |

6: ACCIDENTAL RELEASE MEASURES

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| Protective Measures to be Taken if Material is Released or Spilled | Stop flow of material, contain/absorb small spills with dry sand, earth, and vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of un-neutralized acid to sewer. Acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA. |
| Waste Disposal Method | Dispose of as a hazardous waste. Dispose of in accordance with applicable local, state and federal regulations. |

7. HANDLING AND STORAGE

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| Handling | Do not carry battery by terminals. Do not drop battery, puncture, or attempt to open battery case. Avoid contact with the internal components of a battery. Do not subject product to open flame or fire and avoid situations that could cause arcing between terminals. |
| Storage | Store batteries under roof in cool, dry, well-ventilated areas separated from incompatible materials and from activities that may create flames, spark, or heat. Store sealed lead acid batteries at ambient temperature. |
| Charging: | There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged may generate and release flammable hydrogen gas. Charging space should be ventilated. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged. |
| Other | Follow Manufacturers Recommendations regarding maximum recommended currents and operating temperature range. Do not overcharge beyond the recommended upper charging voltage limit. Applying pressure or deforming the battery may lead to disassembly followed by eye, skin and throat irritation. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits

US OSHA Specifically Regulated Substances (29 CFR 1910.1001 – 1050)

| Ingredient | CAS Number | Type | Value |
|------------|------------|------|------------------------|
| Lead | 7439-92-1 | TWA | 0.05 mg/m ³ |

US OSHA Table Z-1 Limits for Air Contaminants (29CFR 1910.1000)

| Ingredient | CAS Number | Type | Value |
|---------------|------------|------|---------------------|
| Sulfuric Acid | 7664-93-9 | PEL | 1 mg/m ³ |

US ACGIH Threshold Limit Values

| Ingredient | CAS Number | Type | Value | Form |
|---------------|------------|------|------------------------|--------------------|
| Lead | 7439-92-1 | TWA | 0.05 mg/m ³ | |
| Sulfuric Acid | 7664-93-9 | TWA | 0.2 mg/m ³ | Thoracic Fractions |

US NIOSH: Pocket Guide to Chemical Hazards

| Ingredient | CAS Number | Type | Value | Form |
|--------------------------------------|------------|------|--|--|
| Sulfuric Acid | 7664-93-9 | TWA | 1 mg/m ³ | |
| Separator/Paster Paper Fibrous Glass | 65997-17-3 | TWA | 3 fibers/cm ³ 5 mg/ m ³ 5 mg/ m ³ | Fiber Fibers, total dust Fiber Total |
| Lead | 7439-92-1 | TWA | 0.05 mg/m ³ | |

Biological limit values

ACGIH Biological Exposure Indices

| Ingredient | Value | Determinant | Specimen | Sampling Time |
|------------|----------|-------------|----------|---------------|
| Lead | 300 µg/l | Lead | Blood | * |

* - For Sampling details please see the source document.

Engineering Controls (Ventilation):

Store sealed lead acid batteries at ambient temperature. Never recharge batteries in an unventilated, enclosed space. Do not subject product to open flame or fire. Avoid conditions that could cause arcing between terminals.

Respiratory Protection (NIOSH/MSHA approved):

NONE REQUIRED FOR NORMAL HANDLING OF THE FINISHED PRODUCT.

When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Skin Protection:

NONE REQUIRED FOR NORMAL HANDLING OF THE FINISHED PRODUCT.

If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing and boots.

Eye Protection:

NONE REQUIRED FOR NORMAL HANDLING OF THE FINISHED PRODUCT.

If necessary to handle damaged product where exposure to the organic electrolyte is a possibility, chemical splash goggles and a face shield are recommended.

Other Protection:

Safety footwear meeting the requirements of ANSI Z 41.1 is recommended when it is necessary to handle the finished product.

9. PHYSICAL AND CHEMICAL PROPERTIES

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| Appearance and Odor | Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor. | |
| Odor Threshold | Not applicable. | |
| pH | Not applicable | |
| Boiling Point | Not applicable unless individual components exposed. Battery Electrolyte (Acid) - 230 - 233.6 °F (110 - 112 °C) Lead - 3191 °F (1755 °C) | |
| Melting Point | Lead - 621.32 °F (327.4 °C) | |
| Specific Gravity (H₂O = 1) | 1.215 to 1.350 | |
| Flash Point | 498.2 °F (259.0 °C) Hydrogen | |
| Evaporation Rate (Butyl Acetate = 1) | < 1 | |
| Vapor Pressure (mm Hg @ 20 ° C) | Battery Electrolyte (Acid) 11.7 | |
| Flammability | | |
| Upper/lower flammability or explosive limits | Hydrogen | Flammability Limit Lower- 4.1 % Flammability Limit Upper – 74.2 % |
| Vapor Pressure | Not applicable. | |
| Vapor Density | 3.4 (Air = 1) Battery Electrolyte (Acid) | |
| Relative Density | 1.21 - 1.3 Battery Electrolyte (Acid) | |
| Solubility | Lead and Lead dioxide are not soluble. 100 % Battery Electrolyte (Acid). | |
| % Volatile by Weight | Not applicable unless individual components exposed. | |
| Partition coefficient (n-octanol/water) | Not applicable | |
| Auto-ignition temperature | 1076 °F (580 °C) Hydrogen. | |

| | |
|---------------------------|----------------|
| Decomposition temperature | Not applicable |
| Viscosity | Not applicable |

10. STABILITY AND REACTIVITY

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| Stability | The sealed battery is considered stable. |
| Conditions to Avoid | Sparks and other sources of ignition; high temperature; over charging. |
| Incompatibility (materials to avoid) | Electrolyte: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas. Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents. |
| Hazardous Decomposition Products | Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide. Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas. |
| Hazardous Polymerization | Will not occur. |

11. TOXICOLOGICAL INFORMATION

NOTE: Under normal conditions of use, this product does not present a health hazard. The following information is provided for organic electrolyte and lead exposure that may occur due to container breakage or under extreme conditions such as fire. Organic electrolyte – reacts with moisture/water to produce hydrofluoric acid in trace quantities. Hydrofluoric acid is extremely corrosive and toxic. In severe exposures it acts as a systemic poison and causes severe burns. The reaction may be delayed. Any contact with this material, even minor, requires immediate medical attention.

ROUTES AND METHODS OF ENTRY

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|-----------------|--|
| Inhalation | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. Sulfuric Acid: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation. Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs. |
| Skin Contact | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. Sulfuric Acid: Severe irritation, burns and ulceration. Lead Compounds: Not absorbed through the skin. |
| Skin Absorption | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. In the event of overcharging or damage to the unit, exposure to organic electrolyte solution/mist is possible. Extreme exposures to the organic electrolyte can be absorbed through the skin. |
| Eye Contact | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness. Lead Compounds: May cause eye irritation. |
| Ingestion | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. Sulfuric Acid: May cause severe irritation of mouth, throat, esophagus and stomach. Lead Compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to systemic toxicity and must be treated by a physician. |

SIGNS AND SYMPTOMS OF OVEREXPOSURE

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|---------------|---|
| Acute Effects | EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE. Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation. Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability |
|---------------|---|

Chronic Effects

EXPOSURE IS NOT EXPECTED FOR PRODUCT UNDER NORMAL CONDITIONS OF USE.

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat & bronchial tubes.
Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50 µg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

ADDITIONAL HEALTH DATA

All heavy metals, including the hazardous ingredients in this product, are taken into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by adequate precautions such as ventilation and respiratory protection covered in Section 8. Follow good personal hygiene to avoid inhalation and ingestion: wash hands, face, neck and arms thoroughly before eating, smoking or leaving the work site. Keep contaminated clothing out of non-contaminated areas, or wear cover clothing when in such areas. Restrict the use and presence of food, tobacco and cosmetics to non-contaminated areas. Work clothes and work equipment used in contaminated areas must remain in designated areas and never taken home or laundered with personal non-contaminated clothing. This product is intended for industrial use only and should be isolated from children and their environment.

The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction. Risk phrase 61: May cause harm to the unborn child, applies to lead compounds, especially soluble forms.

Toxicological Data

| Constituents | Species | Test Results |
|-------------------------------|---------|--------------|
| Sulfuric Acid (CAS 7664-93-9) | | |
| Acute | | |
| <i>Oral</i> | | |
| LD50 | Rat | 2140 mg/kg |

CARCINOGENICITY

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.

Lead Compounds: Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1)

2B Possibly carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

| | |
|---|--|
| Reproductive toxicity | May damage fertility or the unborn child. |
| Specific target organ toxicity - single exposure | No data available. |
| Specific target organ toxicity - repeated exposure | Lead: May cause damage to organs (blood, central nervous system) through prolonged or repeated exposure. |
| Aspiration hazard | Not classified. |

12. ECOLOGICAL INFORMATION

Environmental Fate Lead is very persistent in soil and sediments. No data on environmental degradation. Mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds and not elemental lead

Ecotoxicity Very toxic to aquatic life with long lasting effects. However, no ecological impacts expected under normal use conditions.

| Constituents | Species | Test Results |
|---|--|---------------------|
| Inorganic Lead/Lead Compounds (CAS 7439-92-1) | | |
| Aquatic | | |
| Fish | LC50 Rainbow trout, Donaldson trout (Oncorhynchus mykiss) | 1.17 mg/l, 96 hours |
| Persistence and Degradability | No data available | |
| Bioaccumulative potential | No data available | |
| Additional Information | No known effects on stratospheric ozone depletion Volatile organic compounds: 0% (by Volume) Water Endangering Class (WGK): NA | |

13. DISPOSAL CONSIDERATIONS

Waste disposal method Material should be recycled if possible. Lead-acid batteries are completely recyclable. Dispose waste and residues in accordance with applicable federal, state, and local regulations.

Hazardous waste code D008: Lead

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or packaging may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

Note: Transportation requirements do not apply once the battery pack has been installed in a vehicle as part of the vehicle's functional components.

Transportation: Sealed Lead Acid / OPTIMA Battery is not a DOT Hazardous Material

Other: Per DOT, IATA, ICAO, and IMDG rules and regulations, these batteries are exempt from "UN2800" classification as a result of successful completion of the following tests:

- 1.) Vibration tests
- 2.) Pressure Differential Tests
- 3.) Case Rupturing Tests (no free liquids)

United States DOT:

Not regulated as dangerous goods per 49 CFR 173.159a

IATA

Not regulated as dangerous goods per Special Provision A67

IMDG

Not regulated as dangerous goods per exception 238

15. REGULATORY INFORMATION

This product is an article pursuant to 29 CFR 1910.1200 and as such is not subjected to the OSHA Hazard Communication Standard. The information on this SDS is supplied at customer's request for information only.

TSCA

Ingredients listed in the TSCA registry are lead, lead compounds, and sulfuric acid.

Sulfuric acid (CAS 7664-93-9)
 Separator/Paster Paper Fibrous Glass (CAS 65997-17-3)

US Pennsylvania Worker and Community Right-to-know Law

Lead (CAS 7439-92-1)
 Sulfuric acid (CAS 7664-93-9)

US Rhode Island RTK

Lead (CAS 7439-92-1)
 Sulfuric acid (CAS 7664-93-9)

US. California Proposition 65

WARNING: This product contains chemicals known to the State of California to cause cancer.
 Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling.

*Battery companies not party to the 1999 consent judgment with Mateel Environmental Justice Foundation should include a Proposition 65 Warning that complies with the current version of Proposition 65.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1)
 Sulfuric acid (CAS 7664-93-9)

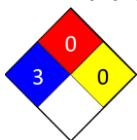
International Inventories

| Country(s) or Region | Inventory Name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

* A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
 A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. OTHER INFORMATION

Issue Date: 04/01/2015
Further information: NFPA Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3=Serious 4 = Severe
NFPA ratings



US Military National Stock Number (NSN)

| Model Number | P/N | NSN |
|------------------|----------|------------------|
| 34/78 | 8004-003 | 6140-01-374-2243 |
| 34 | 8002-002 | 6140-01-378-8232 |
| 34R | 8003-151 | 6140-01-475-9357 |
| 34VX | 8008-158 | 6140-01-534-6466 |
| 25 | 8025-160 | |
| 35 | 8020-164 | |
| 75/25 | 8022-091 | 6140-01-475-9361 |
| 78 | 8078-109 | |
| 850/6 – 1050 SLI | 8010-044 | 6140-01-475-9414 |
| DS46B24R | 8171-767 | |
| 850/6 – 950 (DC) | | |
| D51 | 8071-167 | 6140-01-523-6288 |
| D51R | 8073-167 | 6140-01-529-7226 |
| D35 | 8040-218 | |
| D75/25 | 8042-218 | |
| D34 | 8012-021 | 6140-01-450-0141 |
| D34/78 | 8014-045 | 6140-01-441-4272 |

| | | |
|------|----------|------------------------------------|
| D27F | 8037-127 | 6140-01-600-5785 |
| D31T | 8050-160 | 6140-01-457-5469 |
| D31A | 8051-160 | 6140-01-502-4973 |
| 34M | 8006-006 | 6140-01-441-4280, 6140-01-526-2605 |
| D34M | 8016-103 | 6140-01-475-9355 |
| D27M | 8027-127 | 6140-01-589-0622 |
| D31M | 8052-161 | 6140-01-502-4405 |

Disclaimer

Johnson Controls Battery Group, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.