

MATERIAL SAFETY DATA SHEET

Updated August, 2004

Product: Valve regulated lead-acid battery

Description: Batteries, wet, sealed, maintenance-free, non-spill able.

UN No: 2800

Package group:

Class: 8

Scope: for every model of "DISCOVER" batteries

Battery overall reaction: $Pb + PbO_2 + 2H_2SO_4 = 2 PbSO_4 + 2H_2O$

Hazardous components

Item	%W _t	CSHAPEL (TLV)	LD50 Oral	LD50 Inhalation	LD50 Contact
Lead (Pb,PbO ₂ ,PbSO ₄)	69.64%	0.050mg/m ³	<500mg/kg	<20mg/m ³	n/a
Sulfuric acid	20%	1mg/m ³	2.135mg/kg	17mg/m ³	130mg/kg
Fiberglass separator	5%	—	—	—	—
ABS	5%	—	—	—	—
Antimony	0.0025%	—	—	—	—
Calcium	0.1%	—	—	—	—
Tin	0.25%	2mg/m ³	—	—	—

Physical Data

Component	Density(g/cm ³) @20°C	Melting Points	Solubility in Water	Odor	Appearance
Lead	11.34	327°C	None	None	Grey metal
Lead sulfate	6.2	107°C	40mg/L(15°C)	None	White powder
Lead dioxide	9.4	290°C	None	Acidic	Brown powder
Sulfuric acid	1.300	N/A	100%	None	Colorless liquid
Fiberglass Separator	N/A	N/A	Slight	None	White Membrane
ABS	N/A	N/A	None	None	Solid plastics
Antimony	6.684	630°C	None	None	Silver lustrous grey metal
Calcium	1.55	839°C	None	None	Silver white metal
Tin	7.31	232°C	None	None	White metal

Flammability Data

Component	Flashpoint	Explosive limits	Comments
Lead	None	None	
Sulfuric acid	N/A	None	
Hydrogen		4%	Produced only if the battery be over charged
Fiberglass separator	None	N/A	
ABS		N/A	
Antimony	None	None	
Calcium	None	None	
Tin	None	None	

Corrosive acid

The battery contain dilute sulfuric acid which is a corrosive substance .If the acid get on to your clothing or skin, make sure wash with clean water. Additionally, if the acid gets in your eyes, wash with clean water immediately and see a doctor. Acid can cause a loss of eyesight and a skin burn.

. HEALTH HAZARD INFORMATION

Under normal operating conditions, the internal material will not be hazardous to your health. Only internally exposed material during production or case breakage or extreme heat (fire) may be hazardous to your health.

Routes of Entry:

- Installation: Acid mist from formation process may cause respiratory irritation.
- Skin Contact: Acid may cause irritation, burns and/or ulceration.
- Skin Absorption: Not a significant route of entry.
- Eye Contact: Acid may cause sever irritation, burns, cornea damage and/or blindness.
- Ingestion: Acid may cause irritation of mouth, throat, esophagus and stomach.

Sign and Symptoms of Over Exposures:

Acute Effects:

Over exposure to lead may lead to loss of appetite, constipation, sleeplessness and fatigue. Over exposure to acid may lead to skin irritation, corneal damage of the eyes and upper respiratory system.

Chronic Effects:

Lead and its components may cause damage to kidneys and nervous system. Acid and its components may cause lung damage and pulmonary conditions.

Potential to Cause Cancer:

The International Agency for Research on Cancer has classified “strong inorganic acid mist containing sulfuric acid” as a Category 1 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 is not generated under normal use of this product. Misuse of the product, such as overcharging, may however result in the generation of sulfuric acid mist.

Emergency and First Aid Procedures:

- Inhalation: Remove from exposure and apply oxygen if breathing is difficult.
- Skin: Wash with plenty of soap and water. Remove any contaminated clothing.
- Eyes: Flush with plenty of water immediately for at least 15 minutes. Consult a physician.

- Ingestion: Consult a physician immediately.

FIRE AND EXPLOSION HAZARD DATA:

Flash Point:

Hydrogen = 259 °C

Auto ignition Temperature:

Hydrogen = 580 °C

Extinguishing Media:

Dry chemical, foam, CO₂

Unusual Fire and Explosion Hazards:

Hydrogen and oxygen gases are produced in the cells during normal battery operation (hydrogen is flammable and oxygen supports combustion). These gases enter the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery.

REACTIVITY DATA:

Stability:

Stable

Conditions to Avoid: Sparks and other sources of ignition.

Incompatibility: (materials to avoid)

1. Lead/lead compounds:

Potassium, carbides, sulfides, peroxides, phosphorus, sulfurs.

2. Battery electrolyte (acid):

Combustible materials, strong reducing agents, most metals, carbides, organic materials, chlorates, nitrates, pirates, and fulminates.

Hazardous Decomposition Products:

1. Lead/lead compounds:

Oxides of lead and sulfur.

2. Battery electrolyte (acid):

Hydrogen, sulfur dioxide, and sulfur trioxide.

Conditions to Avoid:

High temperature. Battery electrolyte (acid) will react with water to produce heat. Can react with oxidizing or reducing agents.

CONTROL MEASURES:

Engineering Controls:

Store lead/acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.

Work Practices:

Do not remove vent caps. Follow shipping and handling instructions, which are applicable to the battery type. To avoid damage to terminals and seals, do not double-stack industrial batteries.

PERSONAL PROTECTIVE EQUIPMENT:

Respirator:

Protective equipment must be worn if the battery is cracked or otherwise damaged. HEPA respirator excludes operations. If the OSHA PEL is exceeded.

Eye safety: Goggles, face shield.

Electrical safety: Due to the low internal resistance of power batteries and high power density, high currents are developed across the battery terminals. Do not rest tools or cables on the battery use

insulated tools only follow an diagrams when installing or maintaining battery systems

1. Respiratory Protection:

None required under normal handling conditions. During battery formation (high-rate charge condition), acid mist can be generated which may cause respiratory irritation. Also, if acid spillage occurs in a confined space, exposure may occur. If irritation occurs, wear a respirator suitable for protection against acid mist.

2. Eyes and Face:

Chemical splash goggles are preferred. Also acceptable are "visor-gags" or a chemical face shield worn over safety glasses.

3. Hands, Arms, Body:

Vinyl coated, VC, gauntest type gloves with rough finish are preferred.

4. Other Special Clothing and Equipment:

Safety shoes are recommended when handling batteries. All footwear must meet requirements of ANSI Z41.1 – Rev. 1972.

5. Electrical safety:

Due to the low internal resistance of power batteries and high power density, high levers of shorn developed across the battery terminals. Do not rest tools or cables on the battery use insulated tools only follow an diagrams when installing or maintaining battery systems

PRECAUTIONS FOR SAFE HANDLING AND USE:

1. Hygiene Practices:

Following contact with internal battery components, wash hand thoroughly before eating, drinking, or smoking.

2. Respiratory Protection:

Wear safety glasses. Do not permit flames or sparks in the vicinity of battery(s). If battery electrolyte (acid) comes in contact with clothing, discard clothing.

3. Protective Measures:

a. Remove combustible materials and all sources of ignition. Cover sills with soda ash (sodium carbonate) or quicklime (calcium oxide). Mix well. Make certain mixture is neutral then collect residue and place in a drum or other suitable container. Dispose of a hazardous waste.

b. Wear acid-resistant boots, chemical face shield, chemical splash goggles, and acid-resistant gloves.

Do not release neutralized acid.

4. Waste Disposal Method:

a. Battery electrolyte (acid): Neutralize as above for a spill, collect residue, and place in a drum or suitable container. Dispose of as hazardous waste.

b. **Do not flush lead contaminated acid to sewer.**

c. Batteries: Send to lead smelter for reclamation following applicable Federal, state and local regulations. Product can be recycled along with automotive (SLI) lead acid batteries, or use CSB Recycling Program number (800) 3CSB/USA.

5. Other Handling and Storage Precautions: None Required.

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