

**SECTION I**

MANUFACTURER'S NAME: Delphi Energy and Chassis Systems  
 ADDRESS: Division of Delphi Automotive Systems  
 4800 S. Saginaw St.  
 Flint, MI 48501-1360  
 INFORMATION: 317-579-3355 Hrs. 8 - 4; M - F  
 EMERGENCIAS - INFOTRAC: 1-800-535-5053 (domestic); 352-323-3500 (international)

PREPARED BY: Delphi Automotive Systems  
 CREATION DATE: January 1, 1985  
 REVISED DATE: April 4, 2005

TRADE NAME: Storage Battery, Wet  
 SYNONYMS: Lead/Acid Battery  
 CHEMICAL FAMILY: Liquid content - sulfuric acid  
 VOL/WGT: Varies with model

MSDSNet FID #: 121229

PRODUCT DESCRIPTION/USE: Electric Storage Battery

**SECTION II  
 COMPOSITION & INFORMATION ON INGREDIENTS**

CAS #	COMMON NAME	WT%	TLV mg/m <sup>3</sup> ACGIH	PEL mg/m <sup>3</sup> OSHA	OTHER in mg/m <sup>3</sup>
7439-92-1	Lead	50	0.05	0.05	MSHA - air 0.15 TWA
7664-93-9	Sulfuric acid	15	1	1	ACGIH STEL 3
7732-18-5	Water	25	None	None	None
Mixture	Polypropylene/polyethylene	Balance	Not Est.	Not Est.	Not Est.

**SECTION III  
 HAZARDS IDENTIFICATION**

Emergency Overview: Danger! Explosive gases. Poison causes severe burns.  
 Wet Storage Battery is a manufactured article composed of lead and acid encased in polypropylene, sealed and vented with a flame arrestor to reduce flashback potential. The case color varies. These batteries contain dilute sulfuric acid, a corrosive substance, and may expel explosive gases.

Routes of Entry: Skin: Yes Eye: Yes Inhalation: Yes Ingestion: Yes

Acute/Chronic Health Effects:

Skin: Sulfuric acid mists or liquid irritates the skin and may cause chemical burns. Severity depends on acid concentration and duration of contact.

Eyes: Sulfuric acid mists or liquid irritates the eyes and may cause chemical burns. Severity depends on acid concentration and duration of contact. Scarring of the cornea is possible.

Inhalation: Sulfuric acid mists irritate the nose and throat and may cause respiratory difficulty.

Ingestion: Sulfuric acid mists or liquid irritates the mucous membrane and may cause chemical burns. Repeated prolonged exposure may damage tooth enamel.

Medical Conditions Aggravated by Exposure to Sulfuric Acid: Pulmonary edema, bronchitis, emphysema, eczema, contact dermatitis, dental erosion and traceobronchitis.

#### **SECTION IV FIRST-AID MEASURES**

Skin: Flush the exposed skin with large amounts of water for 15 minutes. Remove contaminated clothing. Seek medical attention.

Eyes: Force eyes open and rinse with clean, cool, running water for 15 minutes. Do not use eye drops or other medication unless advised to do so by a doctor. Seek medical attention immediately after rinsing.

Inhalation: Remove from exposure. Seek medical attention.

Ingestion: Do not induce vomiting. If conscious, drink large quantities of milk or water. Follow with milk of magnesia, beaten egg, egg whites or vegetable oil. Seek medical attention immediately.

#### **SECTION V FIRE-FIGHTING MEASURES**

Flash Point:	Not applicable	Flammable Limits: (Hydrogen Gas) 4.1 % LEL, 74.2% UEL
Autoignition Temperature:	Not applicable	Fire Point: Not applicable

Extinguishing Media: Class ABC extinguisher, carbon dioxide, foam, halon, water spray.

Special Fire Fighting Procedures: Cool exterior of battery if exposed to fire to prevent rupture. Acid mists and vapors in a fire are corrosive. Wear protective clothing and use self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards:

- Hydrogen and oxygen gases are produced during normal battery operation and charging. These gases escape through the battery vents and may form an explosive atmosphere around the battery if ventilation is poor. Avoid open flame, sparks and other ignition sources in areas where batteries are used or stored.
- Sulfuric acid is an oxidizer and can ignite combustibles upon contact.

Hazardous Combustion Products: Acid mists and vapors, toxic fumes from burning plastic.

HMIS Codes: Not determined

NFPA Codes: H = 3 F = 0 R = 2 (Sulfuric acid component only)

## **SECTION VI ACCIDENTAL RELEASE OF MATERIAL**

Spill and Leak Procedures:

Small spill: Neutralize the spill with baking soda, household ammonia and/or water. Rinse clean.

Large spill: Remove combustible materials and all sources of ignition. Contain spill by diking with soda ash (sodium carbonate) or quicklime (calcium oxide). Cover spill with neutralizing agent such as soda ash or quicklime. Mix well. When mixture is neutral collect the residue in a suitable container and dispose of per local, state and federal waste regulations. Wear acid resistant boots, face shield, chemical splash goggles, and acid resistant gloves. Do not release unneutralized acid.

## **SECTION VII HANDLING AND STORAGE**

Storage Temperature:

Min: -20°F (-28°C) for fully charged batteries. 20°F (-6°C) for completely discharged batteries.

Max: 80°F (26°C) for low shelf discharge but up to 100°F (38°C) is safe.

Shelf Life: Not determined.

Special Sensitivity: Avoid direct conductive connection across positive and negative terminals to prevent short circuit.

Storage Precautions: Batteries must be kept in an upright position away from ignition sources. Stack batteries so as to prevent accidental contact between terminal and/or other damage to terminals or containers. Whenever feasible, store on shipping pallet or rack. Do not stack loaded pallets or racks on top of other batteries. Store batteries in cool, well-ventilated location. Keep a supply of neutralizing agent in or near the storage area for emergency use. Avoid storage in areas exposed to heat or solar buildup. When batteries are completely discharged, the electrolyte will freeze when stored below 20°F. Fully charged batteries may be stored at temperatures as low as -20°F.

Handling Precautions: Use a battery carrier to lift battery or place hands at opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of batteries. Do not tilt batteries to an angle greater than 45 degrees. Do not smoke when working near a battery.

## **SECTION VIII EXPOSURE CONTROLS**

Eye Protection: Chemical splash goggles or a full-face shield with safety glasses.

Skin Protection: Acid resistant clothing with rubber/neoprene boots for major spill clean up.

Respiratory Protection: Use NIOSH approved respiratory protection when concentrations exceed exposure guidelines.

Ventilation: Must be provided when charging in an enclosed area (29 CFR 1910.178 (g) and .305 (j)(7)).

Personal Protective Equipment: Lab apron, acid resistant steel-toed boots and protective clothing.

Engineering Controls: Local/building/fire codes may require explosion proof fans and equipment.

Workplace/Hygienic Practices: Upon skin contact, wash thoroughly with soap and water. Keep work areas clean.

Protective Gloves: Acid resistant gloves such as rubber, neoprene, vinyl coated, PVC.

**SECTION IX  
PHYSICAL AND CHEMICAL PROPERTIES**

Boiling Point: Not applicable	Melting Point: >300°F/149°C for case
Vapor Pressure at: Not applicable	Specific Gravity: 1.280 at 77°F/25°C (electrolyte)
Solubility in Water: miscible (sulfuric acid)	pH: < 1.0 (dilute sulfuric acid)
Appearance: A manufactured article cased in plastic with a sealed case, terminals and flame arrestor vent caps. Case color varies. Product is essentially odorless.	

**SECTION X  
STABILITY AND REACTIVITY**

Stable: Yes

Stability - Conditions to Avoid: Use only approved charging methods. Avoid overcharging. Avoid short-circuiting. Avoid sparks and other ignition sources. Keep away from oxidizing and reducing materials. Do not open, break or melt the casing.

Incompatible Materials: Heat, open flames, sparks, strong oxidizing or reducing agents.

Hazardous Decomposition Products: Can emit highly toxic fumes when heated. Combustion can produce carbon dioxide and carbon monoxide. Will release an explosive hydrogen/oxygen gas mixture. Oxides of lead, lead and/or lead compounds may be released. Sulfuric acid may release sulfur dioxide and/or sulfur trioxide.

Hazardous Polymerization: Will not occur

Hazardous Polymerization - Conditions to Avoid: Not applicable

**SECTION XI  
TOXICOLOGY INFORMATION**

Toxicology Data: Wet storage batteries are sealed articles. Exposure to lead, acid and lead contaminated acid is not anticipated during normal storage, handling and intended use or maintenance of the battery. Battery recycling personnel should carefully follow established employer protocols when processing batteries and battery components.

Eye Effects:

Sulfuric Acid - Severe eye irritant

**Skin Effects:**

Sulfuric Acid - Extremely irritating, corrosive, and toxic to tissue, resulting in rapid destruction of tissue, causing severe burns. If much skin is involved, exposure is accompanied by shock, collapse and symptoms similar to those seen in severe burns. Repeated contact with dilute solutions can cause dermatitis.

**Ingestion Effects:**

- Lead - Poison by ingestion in large dosages and with prolonged exposure leading to the same effects as seen in exposure by inhalation. Adults absorb 5-15% of ingested lead and retain less than 5%. Children absorb about 50% and retain about 30%.
- Sulfuric Acid - Moderately toxic by ingestion.

**Inhalation Effects:**

- Lead - For industry, inhalation is much more important than is ingestion. Systemic effects include loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, flaccid paralysis without anesthesia, hallucinations and distorted perceptions, muscle weakness, gastritis and liver changes. Major organ systems affected are the nervous system, blood system and kidneys. Experimental evidence suggests that blood levels of lead below 10 µg/dL can lower the IQ scores of children. Low levels of lead impair neurotransmission and immune system function and may increase systolic blood pressure. Reversible kidney damage can occur from acute exposure. Chronic exposure can lead to irreversible vascular sclerosis, tubular cell atrophy, interstitial fibrosis, and glomerular sclerosis. Very heavy intoxication can sometimes be detected by formation of a dark line on the gum margins.
- Sulfuric Acid - Experimental poison by inhalation. Repeated or prolonged inhalation of sulfuric acid mist can cause inflammation of the upper respiratory tract, leading to chronic bronchitis. Severe exposure may cause chemical pneumonitis. Erosion of tooth enamel due to strong acid fume exposure has been observed in industry. Workers exposed to low concentrations of the vapors gradually lose their sensitivity to its irritating action.

**Carcinogenicity:**

CAS #	Name	OSHA Listed	NTP Listed	IARC
7439-92-1	Lead	Yes	No	2B, Human Limited Evidence
7664-93-9	Sulfuric acid*	Yes	No	1, Human Sufficient Evidence

\* Occupational exposures to strong-acid mists containing sulfuric acid have been associated with several respiratory tract cancers. However, there is no animal data supporting the carcinogenicity of sulfuric acid. Sulfuric acid has been found to be non-mutagenic, and in two studies of workers employed in lead acid battery manufacture, no association between sulfuric acid mist exposure and respiratory tract cancers was observed.

**Mutagenicity:**

Lead - Human mutation data reported.

**Reproductive Effects:**

- Lead - Severe toxicity can cause sterility, abortion, and neonatal mortality and morbidity. Experimental teratogen. Experimental reproductive effects. Pathological lesions have been found on male gonads.
- Sulfuric Acid - Experimental teratogen.

## **SECTION XII ECOLOGICAL INFORMATION**

Ecotoxicological Information: Not applicable.  
Distribution: Not determined.  
Chemical Fate Information: Not determined.

## **SECTION XIII DISPOSAL CONSIDERATIONS**

RCRA Hazard Class: D002

Waste Disposal Method: Wet storage batteries are recyclable and should be turned over to a licensed battery recycler. Do not incinerate.

Sulfuric acid: Neutralize as for a spill; collect residue and place in suitable container; dispose as hazardous waste in accordance with local, state and federal regulations. Do not flush lead contaminated acid into the sewer.

## **SECTION XIV TRANSPORT INFORMATION**

### Canadian TDG Information

TDG Shipping Name: Batteries, Wet Filled with Acid  
Hazard Class: 8  
ID Number: UN 2794  
Packing Group: III  
Special Label or Marking Requirements: Corrosive

### U.S DOT Information

Proper Shipping Name: Batteries, Wet Filled with Acid  
Hazard Class: 8  
ID Number: UN 2794  
Packing Group: III  
RQ: N.A.  
Special Label or Marking Requirements: Corrosive

### International Air Information (IATA Classification)

Proper Shipping Name: Batteries, Wet Filled with Acid  
Hazard Class: 8  
ID Number: UN 2794  
Packing Group: III  
Special Label or Marking Requirements: Corrosive

### International Ocean Information (IMO Classification)

Proper Shipping Name: Batteries, Wet Filled with Acid  
Hazard Class: 8  
ID Number: UN 2794

Packing Group: III  
 Marine Pollutant: No  
 Special Label or Marking Requirements: Corrosive

**SECTION XV  
 REGULATORY INFORMATION**

TSCA Inventory Status: All ingredients are listed on the EPA TSCA Inventory

EPA Hazard Categories:

Immediate (acute) health hazard: Yes  
 Delayed (chronic) health hazard: Yes  
 Fire hazard: No  
 Sudden release of pressure hazard: No  
 Reactive hazard: No

SARA 311/312: Extremely Hazardous Substances

CAS #	Name	RQ	TPQ
7664-93-9	Sulfuric acid	1000 lbs	1000 lbs

SARA 313: Specific Toxic Chemical Listings

CAS #	Name	Percent
7439-92-1	Lead	50%
7664-93-9	Sulfuric acid	15%

CERCLA Section 103: Hazardous Substances List

CAS #	Name	Percent	RQ
7439-92-1	Lead	50%	10 lbs
7664-93-9	Sulfuric acid	15%	1000 lbs

Great Lakes Persistent Toxics - Metals:

CAS #	Name	Percent
7439-92-1	Lead	50%

Volatile Organic Compound (VOC): Not applicable

WHMIS: Controlled as a manufactured article.

Canadian Environmental Protection Act (CEPA):

CAS #	Name	Schedule
7439-92-1	Lead	I and III part II

California Proposition 65 - Reproductive Toxicants

CAS #	Name	Percent
7439-92-1	Lead	50%

Proposition 65 Warning:

Battery posts, terminals, and related accessories contain lead, lead compounds and other chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

## New Jersey Right-to-Know Hazardous Substances

CAS #	Name	Percent
7439-92-1	Lead	50%
7664-93-9	Sulfuric acid	15%

## Massachusetts Substance List

CAS #	Name	Percent
7439-92-1	Lead	50%
7664-93-9	Sulfuric acid	15%

## Pennsylvania Hazardous Substances

CAS #	Name	Percent
7439-92-1	Lead	50%
7664-93-9	Sulfuric acid	15%

## Ontario Designated Substance

CAS #	Name	Percent
7439-92-1	Lead	50%

EINECS: Not determined

**SECTION XVI  
OTHER INFORMATION**

## Label Information:

**DANGER!** Explosive Gases: Always shield eyes and face from battery. Cigarettes, flames, sparks could cause battery to explode. Do not charge or use booster cables or adjust post connections without proper instruction and training.

**POISON!** Causes severe burns: Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately. Do not tip. Keep out of reach of children.

*End of MSDS*