

# MATERIAL SAFETY DATA SHEET

ACCORDING TO REGULATION (EC) No 1907/2006 AND ISO 11014-1

DATE: Sept. 28, 1986

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## 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Battery, wet, filled with acid, electric storage - UN2794**

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## 2 COMPOSITION & INFORMATION ON INGREDIENTS

CAS #	Common Name	Approximate % by Weight or Volume
7439-92-1	*Lead, Lead Compounds	43 - 70%
7664-93-9	* Sulfuric Acid / Battery Electrolyte	10 - 30%
7440-36-0	*Antimony	0 - 6%
7440-38-2	*Arsenic	< 0,1%
7440-70-2	*Calcium	< 0,1%
Non-Hazardous Materials	N/A	5 - 10%
<i>Section 313 (40 CFR 372) Listed Toxic Chemicals are Preceded by an*</i>		

## 3 HAZARD IDENTIFICATION

**Sulfuric Acid:** Under normal conditions of use, Sulfuric Acid vapors and mist are not generated. Sulfuric Acid vapors may be generated when the product is overheated, oxidized or otherwise processed or damaged.

**Lead Compounds:** Under normal conditions of use, Lead dust, vapors and fumes are not generated. Hazardous exposure may occur when the product is overheated, oxidized or otherwise processed or damaged to create dust, vapor or fumes.

**Other:** May form explosive air/gas mixture during charging.

### Routes of entry and potential health effects:

**Inhalation:** Sulfuric Acid vapors or mist may cause severe respiratory irritation. Lead dust or fumes may cause irritation of upper respiratory tract or lungs

**Skin contact:** Sulfuric Acid may cause severe irritation, burns and ulceration. Lead Compounds are not readily absorbed through the skin.

**Eye contact:** Sulfuric Acid may cause severe irritation, burns and cornea damage and possible blindness. Lead Compounds may cause eye irritation.

**Ingestion:** Sulfuric Acid may cause severe irritation of mouth, throat, esophagus and stomach. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue and pain in the arms, legs and joints.

## 4 FIRST AID MEASURES

<b>Inhalation:</b>	If breathing difficulties develop, remove person from exposure. If symptoms persist, seek medical attention
<b>Skin contact:</b>	Flush the exposed skin with large amounts of water for 15 minutes, using deluge emergency shower. Remove contaminated clothing. If symptoms persist, seek medical attention
<b>Eye contact:</b>	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 immediate medical attention after rinsing.
<b>Ingestion:</b>	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.

## 5 FIRE FIGHTING MEASURES

<b>Flash point:</b>	N/A
<b>Auto Ignition Temperature:</b>	N/A
<b>Fire Point:</b>	N/A
<b>Flammable limits:</b> (Hydrogen Gas)	4.1% LEL, 74.2% UEL
<b>Extinguishing Media:</b>	Class ABC extinguisher, Dry Chemical, Foam or Carbon Dioxide

### **Special Fire Fighting Procedures:**

If batteries are on charge, turn off power. Use positive pressure, self-contained breathing apparatus (SCBA) in fighting fire. Water applied to electrolyte generates heat and causes it to splatter. Wear acid resistant clothing. Ventilate area well.

### **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.

## 6 ACCIDENTAL RELEASE MEASURES

### **SPILL AND LEAK PROCEDURES:**

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

## 7 HANDLING AND STORAGE

### PRECAUTIONS FOR SAFE 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 self discharge but up to 100°F (38°C) is safe. Avoid storage in areas exposed to heat or solar buildup.

#### Special Sensitivity:

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

#### Storage Precautions:

- Place cardboard between layers of stacked batteries so as to prevent accidental contact between terminals 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.

#### Handling Precautions:

- Use a battery carrier to lift battery without handle
- Avoid contact with internal components of batteries.
- Do not smoke when working near a battery.

#### Other Precautions:

Keep away from combustible materials, organic chemicals, reducing substances, strong oxidizers and water.

## 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Engineering controls/system design information:

Charge in area's with adequate ventilation. Do not install these batteries in sealed, unventilated area's.

**Ventilation:** General dilution ventilation is acceptable

**Respiratory Protection:** Not required for normal conditions of use.

**Eye Protection:** Safety glasses with side shields or goggles.

**Skin Protection:** Wear chemical resistant gloves as a standard procedure to avoid skin contact. Wash hands after handling.

**Other:** None required under normal use conditions for gel/absorbed electrolyte type batteries.

Exposure Limits	Lead, Lead Compounds	Sulfuric Acid
OSHA	PEL 0.05mg/m <sup>3</sup>	PEL 1mg/m <sup>3</sup> TWA
ACGIH	TLV 0.05mg/m <sup>3</sup>	TLV 0.2mg/m <sup>3</sup>
NIOSH	Rel<0.10 mg/m <sup>3</sup>	Rel<1.0 mg/m <sup>3</sup>

### Additional Information:

- Batteries are housed in polypropylene cases which are regulated as total dust or respirable dust only when they are ground up during recycling. The OSHA PEL for dust is 15 mg/m<sup>3</sup> as total dust or 5 mg/m<sup>3</sup> as respirable dust.
- May be required to meet Domestic Requirements for a Specific Destination(s).

## 9 PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	The entire battery is a solid article consisting of a plastic case with two protruding lead terminals.
<b>Odor:</b>	The battery is odorless.
<b>Odor Threshold:</b>	N/A
<b>Physical State:</b>	Sulfuric Acid is a liquid, Lead is solid
<b>Boiling Point:</b>	112-115 °C
<b>Melting Point:</b>	N/A
<b>Freezing Point:</b>	N/A
<b>Vapour Pressure:</b>	1.33 kPa
<b>Solubility in Water:</b>	Lead, Lead Oxide and Lead Sulfate are insoluble in Water. Sulfuric Acid is 100% soluble in water.

## 10 STABILITY AND REACTIVITY

### Stability:

This product is stable under normal conditions at ambient temperature

### Incompatibility (materials to avoid):

Heat, open flames, sparks, strong oxidizing or reducing agents.

### Hazardous decomposition or by-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.

### Conditions to avoid:

Prolonged overcharge, sparks and other sources of ignition.

## 11 TOXICOLOGICAL INFORMATION

### ACUTE TOXICITY (Test Results Basis and Comments):

<b>Sulfuric Acid</b>	
Oral Rat	LD <sub>50</sub> 2140 mg/kg (25% solution)
Inhalation Rat	LC <sub>50</sub> 510 mg/m <sup>3</sup> /2h
Inhalation Mouse	LC <sub>50</sub> 320 mg/m <sup>3</sup> /2h
Carcinogenicity	ACGIH: A2 Suspected Human Carcinogen OSHA: Select Carcinogen IARC: Group1 Carcinogen
<b>Lead</b>	
Carcinogenicity	IARC: Group 2B Possible Human Carcinogen Risk phrase 61

## 11 TOXICOLOGICAL INFORMATION

### SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):

Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report that abnormal conduction velocities in person 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.

### Additional Information:

- Very little chronic toxicity data available for elemental lead.
- Lead is listed by IARC as a 2B carcinogen: possible carcinogen in humans. Arsenic is listed by IARC, ACGIH, and NTP as a carcinogen, based on studies with high doses overlong periods of time. The other ingredients in this product, present at equal to or greater than 0.1% of the product, are not listed by OSHA, NTP, or IARC as suspect carcinogens.
- 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.

## 12 ECOLOGICAL INFORMATION

### Persistence & Degradability:

Lead is very persistent in soils and sediments. No data available on biodegradation

### Bio-accumulative potential (including mobility):

Mobility of metallic Lead between ecological compartments is low. Bio-accumulation of lead occurs in aquatic and terrestrial animals and plants, but very little bio-accumulation occurs through the food chain. Most studies have included lead compounds, not solid inorganic lead.

### Aquatic toxicity:

Sulfuric Acid	24-hour LC50 fresh water fish (Brachidanio rerio): 82mg/l
	96-hour LOEC fresh water fish (Cyprinus carpio): 22mg/l
Lead	No data available

### Additional information:

- No known effects on stratospheric ozon depletion
- Volatile organic compounds: 0 Vol%
- Water Endangering Class (WGK): NA

## 13 DISPOSAL CONSIDERATIONS

### Waste disposal method:

- Neutralised acid may be flushed down the sewer
- Used Lead Acid Batteries are recyclable when sent to a secondary smelter. Must be treated as hazardous waste

## 14 TRANSPORT INFORMATION

### ADR/RID (road/rail):

UN number: 2794  
Proper shipping name: Batteries, wet, filled with acid  
Class: 8  
Packing group: not applicable  
Packing instructions: P801, P801a  
Classification code: C11  
Special provisions: 295, 598

## 14 TRANSPORT INFORMATION

### Special provision 295:

Batteries need not be individually marked and labelled if the pallet bears the appropriate mark and label.

### Special provision 598:

The following are not subject to the requirements of ADR:

(a) New storage batteries when:

- they are secured in such a way that they cannot slip, fall or be damaged;
- they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
- there are no dangerous traces of alkalis or acids on the outside;
- they are protected against short circuits;

(b) Used storage batteries when:

- their cases are undamaged;
- they are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;
- there are no dangerous traces of alkalis or acids on the outside of the articles;
- they are protected against short circuits.

*"Used storage batteries" means storage batteries carried for recycling at the end of their normal service life.*

### ICAO/IATA (air):

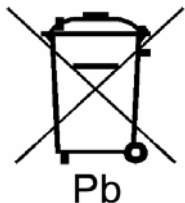
UN number: 2794  
Proper shipping name: Batteries, wet, filled with acid  
Class: 8  
Packing group: not applicable  
Packing instructions: 800  
Special provisions: A51, A164

### IMDG (sea):

UN number: 2794  
Proper shipping name: Batteries, wet, filled with acid  
Class: 8  
Packing group: not applicable  
Marine pollutant: No  
Packing instructions: P801  
Special provisions: 295

## 15 REGULATORY INFORMATION

In accordance with the EU Battery Directive and the respective national legislation, Lead-Acid batteries have to be marked by a crossed out dustbin with the chemical symbol for lead below, together with the ISO return / recycling symbol



## 16 OTHER INFORMATION

The information given above is provided in good faith based on present knowledge and does not constitute an assurance of safety under all conditions. It's the users responsibility to observe all laws and regulations applicable. If there are any queries, the supplier should be consulted.

However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.