

# MATERIAL SAFETY & DATA SHEETS

## BATTERIES - WET FILLED WITH ACID

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**IDENTIFICATION**  
STATEMENT OF HAZARDOUS NATURE

#### HAZARD RATINGS

Flammability: 0  
Toxicity: 0  
Body Contact: 3  
Reactivity: 0  
SCALE: Min/Nil = 0 Low = 1 Moderate = 2 High = 3 Extreme = 4

Product Name: S&S Battery, wet filled with acid  
Other names: Lead Acid Automotive Battery  
CAS RN No(s): None  
UN Number: 2794  
Dangerous Goods Class: 8  
Subsidiary Risk: Hazchem None 2W  
Code: Poisons Schedule Exempt  
Number:

#### USE OF THE MATERIAL:

Power source for electric start motors for motor vehicles.

Charging Hazard, completion of charging process includes evolution of highly flammable and explosive hydrogen gas which is readily detonated by electric spark. No smoking or naked lights. Do not attach/detach metal clips or operate open switches during charging process because arcing/sparking hazard. Overcharging results in vigorous hydrogen evolution - boiling- which may cause generation of corrosive acid mist. Large installations like. battery rooms must be constructed of acid resistant materials and well ventilated.

## PHYSICAL DESCRIPTION/PROPERTIES

### APPEARANCE

Rectangular plastic casing with exposed terminals for electrical connections. High weight to volume ratio.

- The hazard of lead acid batteries include: **CORROSIVE CONTENTS SHORT CIRCUIT** - accidental discharge. Current flow by external heat generated may boil battery acid with evolution of large amounts of highly corrosive acid mist/vapor. Boiling may develop internal pressure and cause explosion with scattering of acid contents.
- Battery circuits must include electrical fusible links: terminals and external metal parts must be insulated. Do not clean terminals or battery top with conducting liquids.
- **SPILL** - damage to casing or overturning may cause corrosive acid contents to spill, causing skin burns on contact. Acid reacts quickly with many metals, generating highly flammable and explosive hydrogen gas; may also weaken metal structures.
- Chemical hazards relate to the contents of the battery.

Boiling Point (deg C):	not applicable
Melting Point (deg C):	not applicable
Vapor Pressure (deg C):	not applicable
Specific Gravity:	1.2 – 1.3 gr/cm <sup>3</sup>
Flash Point (°C):	None
Lower Explosive Limit (%):	not applicable
Upper Explosive Limit (%):	not applicable
Solubility in water (g/L):	not applicable
Packaging Group Number:	3

### INGREDIENTS

Rechargeable electric storage batteries of lead acid electrochemical cells in a vented outer polypropylene casing through which protrude metal terminals connected to alternative grid plates of:

#### Hazardous Ingredients

MATERIAL	% BY WEIGHT	CAS NUMBER	EXPOSURE OSHA	LIMITS ACGIH
Lead	51.4	7439-92-1	0.05mg/m <sup>3</sup>	0.15mg/m <sup>3</sup>
Electrolyte (Sulfuric Acid)	19-44%	7664-93-9	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Lead Dioxide (PbO <sub>2</sub> )	20.8	1309-60-0	0.05mg/m <sup>3</sup>	0.05mg/m <sup>3</sup>
Non-Hazardous Ingredients	8.2			

## HEALTH HAZARD

### ACUTE HEALTH EFFECTS

Health effects relate to the corrosive sulfuric acid battery contents.

### SWALLOWED

Considered an unlikely route of entry in commercial/industrial environments. The liquid is highly discomforting and corrosive if swallowed and capable of causing burns to mouth, throat, esophagus, with extreme discomfort and pain. Ingestion may result in nausea, abdominal irritation, pain and vomiting.

### EYE

The liquid is extremely discomforting and corrosive to the eyes and any contact may cause rapid tissue destruction and is capable of causing sever damage with loss of sight. The material may produce severe irritation to the eye causing pronounced inflammation.

### SKIN

The liquid is highly discomforting and corrosive to the skin and contact may cause tissue destruction i.e. chemical burns.

### INHALED

The vapor/mist is highly discomforting and corrosive to the upper respiratory tract if inhaled.

## CHRONIC HEALTH EFFECTS

Principal routes of exposure are skin contact with acid contents, eye contact with acid contents, inhalation of acid mists generated when overcharging occurs. Repeated minor exposure to acid mist can cause erosion of teeth and inflammation of the upper respiratory tract leading to chronic bronchitis. There is evidence that the corrosion of teeth enamel occurs at 1 mg/m<sup>3</sup> but that acclimatized workers may tolerate three to four times that level. Workers chronically exposed to sulfuric acid may show skin lesions, tracheobronchitis, stomatitis, conjunctivitis and gastritis.

Occupational exposure to strong inorganic acid mists containing sulfuric acid is designated by IARC to be carcinogenic. Increased risk of laryngeal cancer being seen with chronic exposure.

## FIRST AID

### SWALLOWED

Acid contents:

- Rinse mouth with plenty of water.
- If poisoning occurs, contact doctor or Poison Information Centre & If swallowed, DO NOT induce vomiting. Give a glass of water.

### EYE

Acid contents:

If this product comes in contact with the eyes;

Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting upper and lower lids.

Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

Acid contents:

If this product comes in contact with the skin:

Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear. Wash affected areas with water (and soap if available) for at least 15 minutes & transport to hospital or doctor.

### INHALED

Acid contents:

If fumes or combustion products are inhaled, remove to fresh air & lay patient down.

Keep warm and rested & if available, administer medical oxygen by trained personnel. If breathing is shallow or has stopped, ensure clear airway and apply resuscitation

Transport to hospital or doctor without delay.

ADVICE TO DOCTOR

For acute or short term repeated exposures to strong acids:

1. Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
2. Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.
3. Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.

4. Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of dissipating action of the acid on proteins in specific tissues.

#### **INGESTION:**

1. Immediately dilution (milk or water) within 30 minutes post ingestion is recommended.
2. Do not attempt to neutralize the acid since exothermic reaction may extend the corrosive injury
3. Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
4. Charcoal has no place in acid management.
5. Some authors suggest the use of lavage within 1 hour of ingestion. **SKIN:**
  1. Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
  2. Deep second-degree burns may benefit from topical silver sulfadiazine.

#### **EYE:**

1. Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. Do not use neutralizing agents or any other additives. Several litres of saline are required.
2. Cycloplegic drops (1% cyclopentolate for short-term use of 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent or severity of the injury.
3. Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.  
[Ellenhorn and Barceloux: Medical Toxicology].

#### **PRECAUTIONS FOR USE**

##### **EXPOSURE STANDARDS**

No data for S&S Battery, wet filled with acid.

##### **SULFURIC ACID**

- TLV TWA: 1 mg/m<sup>3</sup>, 3 mg/m<sup>3</sup> A2 (A2 refers to sulfuric acid contained in strong inorganic acid mists, not to sulfuric acid per se).
- WARNING: For inhalation exposure ONLY:  
This substance has been classified by the ACGIH as A2 Suspected human carcinogen.
- ES TWA: 1 mg/m<sup>3</sup>: STEL: 3 mg/m<sup>3</sup>
- IDHL level: 80 mg/m<sup>3</sup>
- NOTE: Detector tubes for sulfuric acid, measuring in excess of 1 mg/m<sup>3</sup>, are commercially available. Based on controlled inhalation studies the TLV-TWA is thought to be protective against significant risk of pulmonary irritation and incorporates a margin of safety so as to prevent injury to the skin and teeth seen in battery workers acclimatized to workplace concentrations of 16 mg/m<sup>3</sup>. Experimental evidence in normal un-acclimatized humans indicates the recognition, by all subjects, of odor, taste or irritation at 3 mg/m<sup>3</sup> or 5mg/m<sup>3</sup>. All subjects reported these levels to be objectionable but to varying degrees.

## ENGINEERING CONTROLS

Use in a well-ventilated area.

## PERSONAL PROTECTION

### EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard, soft lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

- Barrier cream with polyethylene gloves or rubber gloves.
- Safety footwear or rubber boots.

### OTHER

- Overalls and rubber apron or PVC apron or acid-resistant overalls.
- Ensure that there is ready access to eye wash unit.
- Do not allow clothing wet with material to stay in contact with skin.
- Ensure there is ready access to an emergency shower.

## GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the "Forsberg Protective Clothing Performances Index". The effect of the following substance (s) is taken into account in the computer-generated selection.

Substance

### SULPHURIC ACID PROTECTIVE MATERIAL CPI\*

Natural rubber	A
Natural + neoprene	A
Neoprene	A
Neoprene/natural	A
Nitrile	A
PE	A
PVC	A
Saranex-23	A
CPI* :-Chemwatch performance index.	

A = Best selection

B = Satisfactory; may degrade after 4 hours continuous immersion

C = Poor to dangerous choice for other than short term immersion.

Note: as a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation.

## RESPIRATOR

Protective Half face Factor 10 x ES	Respirator P2 -	Full-face Respirator	Powered Air Respirator - Air-line*
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The local concentrations of material, quantity and conditions of use determine the type of personal protective equipment required. For further information, consult site specific CHEMWATCH data (if available) or your Occupational Health & Safety Advisor.

## STORAGE AND TRANSPORT

Suitable container Check that containers are clearly labelled.

## STORAGE INCOMPATIBILITY

Protect from accidental short-circuit.

## STORAGE REQUIREMENT

- Keep dry. Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well ventilated area.
- Store away from incompatible materials, including combustibles, organic materials and strong reducing agents.
- Protect containers against physical damage. Check regularly for leaks.
- Observe manufacturers storing and handling recommendations. Incompatibility avoid strong reducing agents, sulphur trioxide gas, strong oxidizer.

## TRANSPORTATION

Class 8 - Corrosives shall not be loaded in the same vehicle or packed in the same freight containers with:

Class 1 -Explosives

Class 4.3 -Dangerous when wet substances

Class 5.1 -Oxidizing agents

Class 5.2 -Organic peroxides

Class 6 -Poisonous (toxic) substances (where the poisonous substance are cyanides and the corrosives are acids).

Class 7 -Radioactive substances; foodstuffs and foodstuff empties.

Class 8 -Strong alkalies

## Packaging

Group Number 3

Insulate terminals against short circuiting. Packed with insert cushioning materials in a fiberboard box - package gross 40kg: wooden box or wooden slatted crate - package gross 225kg.

### SPILLS AND DISPOSAL MINOR SPILLS

If contents exposed:

- Clean up all spills immediately
- Avoid breathing vapors and contact with skin and eyes
- Control personal contact by using protective equipment
- Neutralize contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in suitable labeled container for waste disposal
- Use soda ash or slaked lime to neutralize.

## SAFE HANDLING

### MAJOR SPILLS

- Do not touch the spill material. Clear the area of personnel and move upwind.
- Alert Fire Brigade and tell them the location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protection with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so. Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralizes/decontaminate residue.
- Collect solid residue and seal in labelled drums for disposal. Wash area and prevent run off into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.
- **DO NOT USE WATER OR NEUTRALISING AGENTS INDISCRIMINATELY ON LARGE SPILLS.**

- Use soda ash or slaked lime to neutralize.

## DISPOSAL

Acid contents:

- Recycle wherever possible
- Consult State Land Waste Management Authority for disposal
- DO NOT discharge into sewer or waterways
- Use soda ash or slaked lime to neutralize.

## FIRE/EXPLOSION HAZARD

- Non combustible dangerous hazard when exposed to heat, flame and oxidisers.
- May emit corrosive fumes.
- Decomposes on heating and produces acrid and toxic fumes of sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) and sulfuric oxides (Sox ).
- Contact with readily oxidisable organic material may cause ignition/fire.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- Reacts with metals producing flammable/explosive hydrogen gas.