Material Safety Data Sheet

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Manufacturer's Name: Douglas Battery Manufacturing Co.
Address: 500 Battery Drive, Winston-Salem, NC 27107

Emergency Telephone No.: (910) 665-7200
CHEMTREC (800) 424-9300

Hazard Rating: H328

BATTERY ELECTROLYTE

Date Prepared: Rev. 12/03

SECTION 1 — PRODUCT IDENTIFICATION

Product Name: Battery Electrolyte
Common Synonyms: Sulfuric acid, Electrolyte, Battery acid, Battery fluid.

Chemical Name: Sulfuric Acid
Chemical Family: Inorganic acid, aqueous solution

Formula: H₂SO₄

Product Use: Electrolyte fluid for lead/acid batteries. Production use as component of lead oxide paste, battery formation acid.

SECTION 2 — HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>Hazard Category</th>
<th>Percent Weight</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-0</td>
<td>Corrosive</td>
<td>10-40%</td>
<td>1.0 mg/m³</td>
<td>1.0 mg/m³</td>
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This product description or trade name contains toxic chemicals subject to the reporting requirements under Section 313 of Title III “The Superfund Amendment and Reauthorization Act of 1986” and 40 CFR 372 and California Proposition 65.

SECTION 3 — PHYSICAL AND CHEMICAL CHARACTERISTICS

- **Balling Point**: Approx. 275°F
- **Melting Point**: -32°F to 10.8°F
- **Vapor Pressure (MMPHg)**: 10
- **Vapor Density (AIR=1)**: >1
- **Specific Gravity**: 1.060-1.400
- **Percent Volatile By Volume**: 0 at 70°F
- **Solubility In Water**: 100%
- **Reactivity In Water**: None
- **Appearance**: Clear liquid with sharp, pungent odor.

- **Physical State**: Liquid
- **Flash Point**: <4.0
- **Flammable Limits In Air (Percent by Volume)**: Not Applicable
- **Lower Flammable Limit**: Not Applicable
- **Autoignition Temperature**: Not Applicable
- **Flammable Media**: Fire Extinguisher Media
- **Acid Liquid does not burn. If involved in fire use dry chemical, carbon dioxide.

- **Special Fire Fighting Procedures**: Alcohol foam, carbon dioxide, dry chemical extinguisher.

- **Unusual Fire and Explosion Hazards**: Use self-contained breathing apparatus (SCBA) for fire fighting. Wear full cover sulfuric acid resistant clothing. May release sulfuric acid fumes, sulfur dioxide gas, carbon monoxide. Water mixed with acid may generate heat.

Date copied and placed into MSDS. 06/18/03
SECTION 4 — FIRE AND EXPLOSION HAZARD DATA

Incompatibility (Materials to Avoid): Metals, nitrates, chlorates, zinebides, luminolates, picric acid and other organic materials. Releases hydrogen gas and sulfur dioxide fumes when in contact with most metals.

Stability: Stable


Hazardous Polymerization: Will not occur.

SECTION 5 — HEALTH HAZARDS

Threshold Limit Value (TLV): Permissible exposure limits:

<table>
<thead>
<tr>
<th>TLV:</th>
<th>1 mg/m³ (TWA)</th>
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<tbody>
<tr>
<td>MCH:</td>
<td>1 mg/m³ (10 hr, TWA)</td>
</tr>
<tr>
<td>PEL:</td>
<td>1 mg/m³ (TWA)</td>
</tr>
<tr>
<td>IDLH:</td>
<td>80 mg/m³ (IDLH)</td>
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</table>

Signs and Symptoms of Exposure:

Acute: Eye—Severe burns, cornea damage, blindness.
Nose—Respiratory irritation, inflammation of nasal membranes.
Skin—Severe burns and irritation of mouth, throat, stomach, damage to kidney and intestinal tract.
Skin—Respiratory irritation, inflammation of nasal membranes.

Chronic: Inhalation—Oxidation of teeth, inflammation of nasal membranes.

Medical Conditions Generally Aggravated by Exposure: Respiratory exposure to airborne sulfuric acid will aggravate lung damage or other pulmonary conditions.

Route of Entry: Skin, eyes, inhalation, ingestion.

Carcinogenicity: National Toxicology Program: None found. IARC, Monographs: Yes. OSHA: None found. EPA CAG: None found.

Human Health Effects:

The International Agency for Research on Cancer (IARC) has classified strong inorganic acid mist containing sulfuric acid as a Category 1 carcinogen, i.e., 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 however result in the generation of sulfuric acid mist.

Emergency and First Aid Procedures:

1. Inhaling: Remove from fresh air. If person is unconscious or experiencing breathing difficulty, arrange for emergency transport to a hospital. Administer oxygen/CPD, if appropriate.
2. Eyes: Wash eyes with copious amount of water for 15 minutes or until acid is removed. Hold lid open while washing. See physician immediately.
3. Skin: Remove all contaminated clothing, then skin with copious quantities of water until free of acid.
4. Ingestion: DO NOT INDUCE VOMITING. Do not give anything by mouth to an unconscious patient. See physician immediately. If conscious, wash out mouth, do not swallow.

SECTION 6 — SPECIAL PROTECTION INFORMATION

Respiratory Protection:Half-masks or full face mask, or PAPR with acid mist filter or Type C supplied air or self contained breathing apparatus (SCBA) depending on airborne concentration.

Ventilation: Local exhaust, general ventilation.

Protective Gloves: Acid-resistant rubber or plastic with elbow length gauntlet and rolled over cuff.

Eye Protection: Do not wear contact lenses. Use safety glasses with face shield or acid-resistant goggles.

Other Protective Equipment: For Spills: Use acid-resistant apron, full body clothing and boots.

SECTION 7 — SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions in Handling and Storage: Store in cool, dry, well-ventilated area away from incompatible materials. When mixing with water, pour acid slowly into the water. Keep acid away from fire, sparks and heat.

Other Precautions: Mark containers with appropriate hazard warning labels:

| Poison-Proof Sealed | Sealed
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<td>Contains Sulfuric Acid</td>
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Material Spills or Releases: Stop leak and contain spill if possible without risk. Wear respiratory protection and acid-resistant clothing, including gloves and eye and face protection. Neutralize with alkali such as lime, soda ash or sodium bicarbonate.

Waste Disposal: Dispose of waste in accordance with applicable local, state, and Federal regulations. Unneutralized electrolyte may require disposal as EPA corrosive waste. - D002.