MATERIAL SAFETY DATA SHEET

BATTERY FLUID ACID
(US, CN, EU Version for International Trade)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>PRODUCT NAME:</th>
<th>Battery Fluid Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTHER PRODUCT NAMES:</td>
<td>Battery Electrolyte, UN2796</td>
</tr>
</tbody>
</table>

MANUFACTURER: East Penn Manufacturing Company, Inc.
DIVISION: Deka Road
ADDRESS: Lyon Station, PA 19536 USA

EMERGENCY TELEPHONE NUMBERS:
US: CHEMTREC 1-800-424-9300
CN: CHEMTREC 1-800-424-9300
Outside US: 1-703-527-3887

NON-EMERGENCY HEALTH/SAFETY INFORMATION: 1-610-682-6361

CHEMICAL FAMILY: Sulfuric acid solution.

PRODUCT USE: Electrolyte for Industrial/Commercial electric storage batteries.

This product is considered a Hazardous Substance, Preparation or Article that is regulated under US-OSHA; CAN-WHMIS; IOSH; ISO; UK-CHIP; or EU Directives (67/548/EEC-Dangerous Substance Labeling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labeling, 2001/58/EC-MSDS Content, and 1907/2006/EC-REACH), and an MSDS/SDS is required for this product considering that when used as recommended or intended, or under ordinary conditions, it may present a health and safety exposure or other hazard.

Additional Information
This product may not be compatible with all environments, such as those containing liquid solvents or extreme temperature or pressure. Please request information if considering use under extreme conditions or use beyond current product labeling.

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification:

<table>
<thead>
<tr>
<th>Health</th>
<th>Environmental</th>
<th>Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity – Not listed (NL)</td>
<td>Aquatic Toxicity – NL</td>
<td>NFPA – Flammable gas, hydrogen (during charging of batteries or contact with finely-divided metals)</td>
</tr>
<tr>
<td>Eye Corrosion – Corrosive</td>
<td></td>
<td>CN - NL</td>
</tr>
<tr>
<td>Skin Corrosion – Corrosive</td>
<td></td>
<td>EU - NL</td>
</tr>
<tr>
<td>Skin Sensitization – NL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutagenicity/Carcinogenicity – NL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproductive/Developmental – NL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Organ Toxicity (Repeated) – NL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GHS Label: Battery Fluid, Acid

Symbols: C (Corrosive)

Hazard Statements
Contact may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin.

Precautionary Statements
Keep out of reach of children. Keep containers tightly closed.

EMERGENCY OVERVIEW:
Causes severe burns. Acid mist is irritating to eyes, respiratory system, and skin. Prolonged inhalation or ingestion may result in serious damage to health.
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POTENTIAL HEALTH EFFECTS:

EYES: Direct contact with liquid may cause severe burns or blindness.
SKIN: Direct contact with battery fluid may cause skin irritation or damaging burns.
INGESTION: Swallowing this product may cause severe burns to the esophagus and digestive tract and may be harmful or fatal.
INHALATION: Respiratory tract irritation and possible long term effects.

ACUTE HEALTH HAZARDS:
Repeated or prolonged contact may cause skin irritation and/or chemical burns.

CHRONIC HEALTH HAZARDS:
Chronic inhalation of strong mineral acid mists containing sulfuric acid may increase the risk of lung cancer. IARC has listed strong mineral acid mists containing sulfuric acid as a Category 1 carcinogen (carcinogenic in humans).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Pulmonary edema and bronchitis. Skin diseases may also predispose one to acute and chronic effects of sulfuric acid.

Additional Information
None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS (Chemical/Common Names):  CAS No.:  % by Wt:  EC No.:
Sulfuric acid  7664-93-9  30-43 (average: 36.5)  231-639-5

Additional Information
None known.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: An eye wash/emergency shower should be provided wherever battery acid exposure is possible. Flush eyes with large amounts of water for at least 15 minutes. Remove contaminated clothing and seek immediate medical attention if eyes have been exposed directly to acid.

SKIN CONTACT: Flush affected area(s) with large amounts of water using deluge emergency shower, if available, shower for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.

INGESTION: If swallowed, give large amounts of water. Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death.

INHALATION: If inhaled, remove person to fresh air. If breathing difficulties develop, obtain medical treatment.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE/UNSUITABLE EXTINGUISHING MEDIA:
Dry chemical, carbon dioxide, foam. Trained fire fighters may use water spray under certain conditions.

SPECIAL FIRE FIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:
Sulfuric acid will not burn, but is capable of igniting finely divided combustible materials on contact. Use dry chemical agents to smother combustible materials. Avoid breathing mists and vapors. Use full protective equipment (acid-resistant bunker gear) and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Battery fluid can evolve flammable hydrogen gas when exposed to metals (such as during charging of lead acid batteries) and may increase the fire risk near sparks, excessive heat or open flames. See Section 10 for list of fire by-products.

SPECIFIC HAZARDS IN CASE OF FIRE:
Battery Electrolyte (Sulfuric Acid) is Corrosive.

Additional Information
Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.
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SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Electrolyte material contains sulfuric acids and is corrosive. Wear appropriate protective clothing. If toxic vapors are produced at unknown concentrations, wear a NIOSH-approved respirator or SCBA.

ENVIRONMENTAL PRECAUTIONS:
Prevent spilled material from entering sewers and waterways.

SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:
Stop flow of leaking liquid. Small spills: Use clay, sand, or diatomaceous earth. Dike large spills. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium carbonate/bicarbonate, or lime. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

Additional Information
None known.

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING AND STORAGE:
• Keep containers tightly closed when not in use.
• Do not handle near heat, sparks, or open flames.
• Protect containers from physical damage to avoid leaks and spills.
• Wear appropriate PPE.

OTHER PRECAUTIONS (e.g.: Incompatibilities):
Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION:
Use in areas with adequate ventilation.

VENTILATION:
General dilution ventilation is acceptable. Use local exhaust ventilation if occupational exposure limits are exceeded.

RESPIRATORY PROTECTION:
Not required for normal conditions of use. See also special firefighting procedures (Section 5).

EYE PROTECTION:
Wear protective glasses with side shields or goggles. Use a full face shield when pouring acid or when splashing may occur.

SKIN PROTECTION:
Wear acid resistant gloves as a standard procedure to prevent skin contact.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Acid resistant apron and face shield recommended when adding water or electrolyte to batteries.

EXPOSURE GUIDELINES & LIMITS:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Value (Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA</td>
<td>1.0 mg/m³</td>
</tr>
<tr>
<td>ACGIH</td>
<td>0.2 mg/m³</td>
</tr>
<tr>
<td>Quebec</td>
<td>1.0 mg/m³ TWA</td>
</tr>
<tr>
<td>Ontario</td>
<td>3.0 mg/m³ STEV</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.0 mg/m³ TWA</td>
</tr>
<tr>
<td>Germany</td>
<td>2.0 mg/m³ STEL</td>
</tr>
</tbody>
</table>

TWA: 8-Hour Time-Weighted Average; STE: Short-Term Exposure; mg/m³: milligrams per cubic meter of air; NE: Not Established; STEV: Short-Term Exposure Value; TWAEV: Time-Weighted Average Exposure Value; STEL: Short-Term Exposure Limit
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Additional Information
None known.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPEARANCE:</td>
<td>Clear, colorless liquid</td>
</tr>
<tr>
<td>ODOR:</td>
<td>Odorless</td>
</tr>
<tr>
<td>ODOR THRESHOLD:</td>
<td>NA</td>
</tr>
<tr>
<td>PHYSICAL STATE:</td>
<td>Sulfuric Acid: Liquid</td>
</tr>
<tr>
<td>pH:</td>
<td>&lt;1</td>
</tr>
<tr>
<td>BOILING POINT:</td>
<td>235-240° F (113-116° C)</td>
</tr>
<tr>
<td>MELTING POINT:</td>
<td>NA</td>
</tr>
<tr>
<td>FREEZING POINT:</td>
<td>NA</td>
</tr>
<tr>
<td>VAPOR PRESSURE:</td>
<td>13 mmHg</td>
</tr>
<tr>
<td>VAPOR DENSITY (AIR = 1):</td>
<td>NA</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H2O = 1):</td>
<td>1.2–1.3</td>
</tr>
<tr>
<td>EVAPORATION RATE (n-BuAc=1):</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER:</td>
<td>100%</td>
</tr>
<tr>
<td>FLASH POINT:</td>
<td>NA</td>
</tr>
<tr>
<td>AUTO-IGNITION TEMPERATURE:</td>
<td>932° F (as hydrogen gas)</td>
</tr>
<tr>
<td>LOWER EXPLOSIVE LIMIT (LEL):</td>
<td>4% (as hydrogen gas)</td>
</tr>
<tr>
<td>UPPER EXPLOSIVE LIMIT (UEL):</td>
<td>74% (as hydrogen gas)</td>
</tr>
<tr>
<td>PARTITION COEFFICIENT:</td>
<td>NA</td>
</tr>
<tr>
<td>VISCOSITY (poise @ 25° C):</td>
<td>Not Available</td>
</tr>
<tr>
<td>DECOMPOSITION TEMPERATURE:</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

FLAMMABILITY/HMIS HAZARD CLASSIFICATIONS (US/CN/EU): As sulfuric acid
HEALTH: 3  FLAMMABILITY: 0  REACTIVITY: 2

SECTION 10: STABILITY AND REACTIVITY

STABILITY: This product is stable under normal conditions at ambient temperature.
INCOMPATIBILITY (MATERIAL TO AVOID): Strong bases, finely divided combustible materials, reducing agents, finely divided metals, and strong oxidizers.
HAZARDOUS DECOMPOSITION BY-PRODUCTS: Thermal decomposition will produce sulfur dioxide, sulfur trioxide, sulfuric acid mist, and hydrogen.
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Finely divided metals. Concentrated acid may react with water.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):
LD₅₀, Rat: 2140 mg/kg
LC₅₀, Guinea pig: 510 mg/m³
SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):
IARC listed strong mineral acid mists containing sulfuric acid as a Category 1 carcinogen (Carcinogenic to humans).

Additional Information
None known.

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE & DEGRADABILITY: Sulfuric acid is reactive and not very persistent in the ecosystem.
BIO-ACCUMULATIVE POTENTIAL (Including Mobility): Very high mobility and solubility indicate very low risk of bioaccumulation.
AQUATIC TOXICITY (Test Results & Comments):

East Penn Manufacturing Co., Inc.

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24-hour LC₅₀, fresh water fish (*Brachydanio rerio*): 82 mg/l
96-hour LOEC, fresh water fish (*Cyprinus carpio*): 22 mg/l (lowest observable effect concentration)

Additional Information
- No known effects on stratospheric ozone depletion.
- Volatile organic compounds: 0% (by Volume)
- Water Endangering Class (WGK): NA

### SECTION 13: DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL**

**METHOD:** Neutralize acid and follow local, State/Provincial, and Federal/National regulations applicable to as-used, end-of-life characteristics to be determined by end-user.

**HAZARDOUS WASTE CLASS/CODE:**

US – Spilled sulfuric acid is a characteristic hazardous waste, U.S. EPA hazardous waste code D002.
CN – Not applicable to finished product as manufactured for distribution into commerce.
EWC – Not applicable to finished product as manufactured for distribution into commerce.

Additional Information

Battery Electrolyte (Sulfuric Acid) is Corrosive. Dispose as allowed by local jurisdiction for the end-of-life characteristics.

### SECTION 14: TRANSPORT INFORMATION

**GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>Battery Fluid, Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
<tr>
<td>ID Number</td>
<td>UN2796</td>
</tr>
<tr>
<td>Labels</td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

**AIRCRAFT – ICAO-IATA:**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
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<td>8</td>
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</tr>
<tr>
<td>Labels</td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

Reference IATA packing instructions Y809 and 809.

**VESSEL – IMO-IMDG:**

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>8</td>
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<tr>
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<td>UN2796</td>
</tr>
<tr>
<td>Labels</td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

Reference IMDG packing instructions P001.

Additional Information

Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped.

### SECTION 15: REGULATORY INFORMATION

**INVENTORY STATUS:**

All components are listed on the TSCA; EINECS/ELINCS; and DSL, unless noted otherwise below.

**U.S. FEDERAL REGULATIONS:**

**TSCA Section 8b – Inventory Status:** All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

**TSCA Section 12b – Export Notification:** If the finished product contains chemicals subject to TSCA Section 12b export notification, they are listed below:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>NA</td>
</tr>
</tbody>
</table>

**CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)**

Chemicals present in the product which could require reporting under the statute:
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Chemical CAS #
Sulfuric acid 7664-93-9

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
The finished product contains chemicals subject to the reporting requirements of Section 313 of SARA Title III.

Chemical CAS # % wt
Sulfuric acid 7664-93-9 36.5

CERCLA SECTION 311/312 HAZARD CATEGORIES: Note that the finished product is exempt from these regulations, but lead and sulfuric acid above the thresholds are reportable on Tier II reports.

Fire Hazard No
Pressure Hazard No
Reactivity Hazard No
Immediate Hazard Yes (EPA lists sulfuric acid as an Extremely Hazardous Substance)
Delayed Hazard No

Sulfuric acid is regulated as an Extremely Hazardous Substance

STATE REGULATIONS (US):

California Proposition 65
The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects, or other reproductive harm:

Chemical CAS # % Wt
Strong inorganic acid mists including sulfuric acid NA 36.5

California Consumer Product Volatile Organic Compound Emissions
This Product is not regulated as a Consumer Product for purposes of CARB/OTC VOC Regulations, as-sold for the intended purpose and into the industrial/Commercial supply chain.

INTERNATIONAL REGULATIONS (Non-US):

Canadian Domestic Substance List (DSL)
All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.

WHMIS Classifications
Class E: Corrosive materials present at greater than 1%
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Controlled Products Regulations.

NPRI and Ontario Regulation 127/01
This product contains the following chemicals subject to the reporting requirements of Canada NPRI +/- Ont. Reg. 127/01:

Chemical CAS # % Wt
None NA NA

European Inventory of Existing Commercial Chemical Substances (EINECS)
All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC.

R-Phrases S-Phrases
35 1/2, 26, 30, 45

Additional Information
This product may be subject to additional regulations and laws not identified above, such as for uses other than described or as-designed/as-intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:
Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).
Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

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SOURCES OF INFORMATION:
Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents.
RTECS – Registry of Toxic Effects of Chemical Substances, National institute for Occupational Safety and Health.

MSDS/SDS PREPARATION INFORMATION:
DATE OF ISSUE: 29 November 2010
SUPERCEDES: 10 July 2010

DISCLAIMER:
This Material Safety Data Sheet is based upon information and sources available at the time of preparation or revision date. Information in the MSDS was obtained from sources which we believe are reliable, but are beyond our direct supervision or control. We make no Warranty of Merchantability, Fitness for any particular purpose or any other Warranty, Expressed or Implied, with respect to such information and we assume no liability resulting from its use. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. It is the obligation of each user of this product to determine the suitability of this product and comply with the requirements of all applicable laws regarding use and disposal of this product. For additional information concerning East Penn Manufacturing Co., Inc. products or questions concerning the content of this MSDS please contact your East Penn representative.

END