

MATERIAL SAFETY DATA SHEET

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I. CHEMICAL PRODUCT IDENTIFICATION

Product Name: NONSPILLABLE LEAD-ACID BATTERY
HMIS Ratings:
NFPA Ratings:

Health: Serious(3)
 Flammability: Minimal(0)
 Instability/Reactivity: Moderate(2)

Other: SULFURIC ACID IS WATER-REACTIVE IF CONCENTRATED.

II. COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Ingredients	C.A.S. Number	% By Weight	ACGIH TLV TWA/STEL	OSHA PEL TWA/STEL	Other TWA/STEL	LD50	LC50
LEAD	7439-92-1	45 - 60	150(UG/M ³)	50(UG/M ³)	NIOSH: 100(UG/M ³)		
Notes	INORGANIC LEAD COMPOUND						
LEAD DIOXIDE	1309-60-0	15 - 25	150(UG/M ³)	50(UG/M ³)	NIOSH: 100(UG/M ³)		
Notes	INORGANIC LEAD COMPOUND						
ANTIMONY	7440-36-0	2	500(UG/M ³)	500(UG/M ³)			
Notes	INORGANIC LEAD COMPOUND						
ARSENIC	7440-38-2	0.2	200(UG/M ³)	10(UG/M ³)			
Notes	INORGANIC LEAD COMPOUND						
CALCIUM	7440-70-2	0.2					
Notes	INORGANIC LEAD COMPOUND						
TIN	7440-31-5	0.2	2000(UG/M ³)	2000(UG/M ³)			
Notes	INORGANIC LEAD COMPOUND						
ELECTROLYTE (SULFURIC ACID)	7664-93-9	10 - 30	1000(UG/M ³)	1000(UG/M ³)	1000(UG/M ³)		
Notes							
POLYPROPYLENE	9003-07-0						
Notes							
POLYSTYRENE	9003-53-6						
Notes							
STYRENE ACRYLONITRILE	9003-54-7						
Notes							
ACRYLONITRILE BUTADIENE	9003-56-9						

STYRENE							
Notes							
STYRENE BUTADIENE	9003-55-8						
Notes							
POLYVINYLCHLORIDE	60018-6-2						
Notes							
POLYCARBONATE, HARD RUBBER, POLYETHYLENE							
Notes							
SILICON DIOXIDE (GEL BATTERIES ONLY)	7631-86-9	20 – 40	N/A	N/A	N/A		
Notes							
SHEET MOLDING COMPOUND			N/A	N/A	N/A		
Notes							
Other:	INORGANIC LEAD AND ELECTROLYTE (SULFURIC ACID) ARE THE PRIMARY COMPONENTS OF EVERY BATTERY MANUFACTURED BY ENERSYS. OTHER INGREDIENTS MAY BE PRESENT DEPENDENT UPON BATTERY TYPE.						

III. HAZARDS IDENTIFICATION PRIMARY ROUTE OF ENTRY

Eyes:	SULFURIC ACID: SEVERE IRRITATION, BURNS, CORNEA DAMAGE, AND BLINDNESS. LEAD COMPOUNDS: MAY CAUSE IRRITATION.
Skin:	SULFURIC ACID: SEVERE IRRITATION, BURNS AND ULCERATION. LEAD COMPOUNDS: NOT ABSORBED THROUGH THE SKIN.
Ingestion:	SULFURIC ACID: MAY CAUSE SEVERE IRRITATION OF MOUTH, THROAT, ESOPHAGUS AND STOMACH. LEAD COMPOUNDS: ACUTE INGESTION MAY CAUSE ABDOMINAL PAIN, NAUSEA, VOMITING, DIARRHEA AND SEVERE CRAMPING. THIS MAY LEAD RAPIDLY TO SYSTEMIC TOXICITY AND MUST BE TREATED BY A PHYSICIAN.
Inhalation:	SULFURIC ACID: BREATHING OF SULFURIC ACID VAPORS OR MISTS MAY CAUSE SEVERE RESPIRATORY IRRITATION. LEAD COMPOUNDS: INHALATION OF LEAD DUST OR FUMES MAY CAUSE IRRITATION OF UPPER RESPIRATORY TRACT AND LUNGS.
Signs and Symptoms of Exposure:	EFFECTS OF OVEREXPOSURE – ACUTE: SULFURIC ACID: SEVERE SKIN IRRITATION, DAMAGE TO CORNEA, UPPER RESPIRATORY IRRITATION. LEAD COMPONENTS: SYMPTOMS OF TOXICITY INCLUDE HEADACHE, FATIGUE, ABDOMINAL PAIN, LOSS OF APPETITE, MUSCULAR ACHES AND WEAKNESS, SLEEP DISTURBANCES AND IRRITABILITY. EFFECTS OF OVEREXPOSURE – CHRONIC: SULFURIC ACID: POSSIBLE EROSION OF TOOTH ENAMEL, INFLAMMATION OF NOSE, THROAT AND BRONCHIAL TUBES. LEAD COMPOUNDS: ANEMIA; NEUROPATHY, PARTICULARLY OF THE MOTOR NERVES, WITH WRIST DROP; KIDNEY DAMAGE; REPRODUCTIVE CHANGES IN MALES AND FEMALES. OVEREXPOSURE TO SULFURIC ACID MIST MAY CAUSE LUNG DAMAGE AND AGGRAVATE PULMONARY CONDITIONS. CONTACT OF SULFURIC ACID WITH

Medical Conditions	SKIN MAY AGGRAVATE DISEASES SUCH AS ECZEMA AND CONTACT DERMATITIS. LEAD AND ITS COMPOUNDS CAN AGGRAVATE SOME FORMS OF KIDNEY, LIVER AND NEUROLOGIC DISEASES.
Aggravated by Exposure:	
Other:	<p>ROUTES OF ENTRY: SULFURIC ACID: HARMFUL BY ALL ROUTES OF ENTRY. LEAD COMPOUNDS: HAZARDOUS EXPOSURE CAN OCCUR ONLY WHEN PRODUCT IS HEATED, OXIDIZED OR OTHERWISE PROCESSED OR DAMAGED TO CREATE DUST, VAPOR OR FUME.</p> <p>CARCINOGENICITY: SULFURIC ACID: THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSIFIED "STRONG INORGANIC ACID MIST CONTAINING SULFURIC ACID" AS A CATEGORY I CARCINOGEN, A SUBSTANCE THAT IS CARCINOGENIC TO HUMANS. THIS CLASSIFICATION DOES NOT APPLY TO LIQUID FORMS OF SULFURIC ACID OF 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 A OVERCHARGING, MAY RESULT IN THE GENERATION OF SULFURIC ACID MIST. LEAD COMPOUNDS: LEAD IS LISTED AS 2B CARCINOGEN, LIKELY IN ANIMALS AT EXTREME DOSES. PROOF OF CARCINOGENICITY IN HUMANS IS LACKING AT PRESENT. ARSENIC: LISTED BY NATIONAL TOXICOLOGY PROGRAM (NTP), INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), OSHA AND NIOSH AS A CARCINOGEN ONLY AFTER PROLONGED EXPOSURE AT HIGH LEVELS.</p>

IV. FIRST AID MEASURES

Eyes:	SULFURIC ACID AND LEAD: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES; CONSULT PHYSICIAN.
Skin:	<p>SULFURIC ACID: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES; REMOVE CONTAMINATED CLOTHING COMPLETELY, INCLUDING SHOES. LEAD: WASH IMMEDIATELY WITH SOAP AND WATER.</p>
Ingestion:	<p>SULFURIC ACID: GIVE LARGE QUANTITIES OF WATER: DO NOT INDUCE VOMITING; CONSULT PHYSICIAN. LEAD: CONSULT PHYSICIAN.</p>
Inhalation:	<p>SULFURIC ACID: REMOVE TO FRESH AIR IMMEDIATELY. IF BREATHING IS DIFFICULT, GIVE OXYGEN. LEAD: REMOVE FROM EXPOSURE, GARGLE, WASH NOSE AND LIPS; CONSULT PHYSICIAN.</p>
Other:	PROPOSITION 65: BATTERY POSTS, TERMINALS AND RELATED ACCESSORIES CONTAIN LEAD AND LEAD COMPOUNDS, CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND REPRODUCTIVE HARM. BATTERIES ALSO CONTAIN OTHER CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. WASH HANDS AFTER HANDLING.

V. FIRE FIGHTING MEASURES

Flash Point:	N/A
Lower Flammability Limit:	4.1% (HYDROGEN GAS)
Upper Flammability Limit:	74.2%
Extinguishing Agents:	C02; FOAM; DRY CHEMICAL

Unusual Fire or Explosion Hazards: HIGHLY FLAMMABLE HYDROGEN GAS IS GENERATED DURING CHARGING AND OPERATION OF BATTERIES. TO AVOID RISK OF FIRE OR EXPLOSION, KEEP SPARKS OR OTHER SOURCES OF IGNITION AWAY FROM BATTERIES. DO NOT ALLOW METALLIC MATERIALS TO SIMULTANEOUSLY CONTACT NEGATIVE AND POSITIVE TERMINALS OF CELLS AND BATTERIES. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND SERVICE.

Fire Fighting Procedures: IF BATTERIES ARE ON CHARGE, SHUT OFF POWER. USE POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS. WATER APPLIED TO ELECTROLYTE GENERATES HEAT AND CAUSES IT TO SPATTER. WEAR ACID-RESISTANT CLOTHING.

VI. ACCIDENTAL RELEASE MEASURES

Containment/Cleanup: STOP FLOW OF MATERIAL, CONTAIN/ABSORB SMALL SPILLS WITH DRY SAND, EARTH, AND VERMICULITE. DO NOT USE COMBUSTIBLE MATERIALS. IF POSSIBLE, CAREFULLY NEUTRALIZE SPILLED ELECTROLYTE WITH SODA ASH, SODIUM BICARBONATE, LIME, ETC. WEAR ACID-RESISTANT CLOTHING, BOOTS, GLOVES, AND FACE SHIELD. DO NOT ALLOW DISCHARGE OF UNNEUTRALIZED ACID TO SEWER.

VII. HANDLING AND STORAGE

Other: STORE BATTERIES IN COOL, DRY, WELL-VENTILATED AREAS WITH IMPERVIOUS SURFACES AND ADEQUATE CONTAINMENT IN THE EVENT OF SPILLS. BATTERIES SHOULD ALSO BE STORED UNDER ROOF FOR PROTECTION AGAINST ADVERSE WEATHER CONDITIONS. SEPARATE FROM INCOMPATIBLE MATERIALS. STORE AND HANDLE ONLY IN AREAS WITH ADEQUATE WATER SUPPLY AND SPILL CONTROL. AVOID DAMAGE TO CONTAINERS. KEEP AWAY FROM FIRE, SPARKS AND HEAT. PRECAUTIONARY LABELING:
POISON – CAUSES SEVERE BURNS
DANGER – CONTAINS SULFURIC ACID

VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: CHEMICAL GOOGLES OR FACE SHIELD.

Skin: PROTECTIVE GLOVES: RUBBER OR PLASTIC ACID-RESISTANT GLOVES WITH ELBOW-LENGTH GAUNTLET.
OTHER PROTECTION: ACID-RESISTANT APRON. UNDER SEVERE EXPOSURE EMERGENCY CONDITIONS, WEAR ACID-RESISTANT CLOTHING AND BOOTS.

Respiratory: NONE REQUIRED UNDER NORMAL CONDITIONS. WHEN CONCENTRATIONS OF SULFURIC ACID MIST ARE KNOWN TO EXCEED THE PEL, USE NIOSH OR MSHA-APPROVED RESPIRATORY PROTECTION.

Engineering: STORE AND HANDLE IN WELL-VENTILATED AREA. IF MECHANICAL VENTILATION IS USED, COMPONENTS MUST BE ACID-RESISTANT.

Other: WORK PRACTICES: HANDLE BATTERIES CAUTIOUSLY TO AVOID SPILLS. MAKE CERTAIN VENT CAPS ARE ON SECURELY. AVOID CONTACT WITH INTERNAL COMPONENTS. WEAR PROTECTIVE CLOTHING WHEN FILLING OR HANDLING BATTERIES.
EMERGENCY FLUSHING: IN AREAS WHERE SULFURIC ACID IS HANDLED IN CONCENTRATIONS GREATER THAN 1%, EMERGENCY EYEWASH STATIONS AND SHOWERS SHOULD BE PROVIDED, WITH UNLIMITED WATER SUPPLY.

IX. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: *ELECTROLYTE IS A CLEAR LIQUID

Boiling Point: 203 – 240° F

Solubility in Water: (H₂O= 1) 100%

Specific Gravity: 1.215 TO 1.350
Vapor Pressure: (MM HG): 10
Vapor Density: (AIR = 1) GREATER THAN 1
Volatile Content: % VOLATILE BY WEIGHT: N/A

Other: *APPEARANCE AND ODOR: MANUFACTURED ARTICLE; NO APPARENT ODOR.
 MELTING POINT: N/A
 EVAPORATION RATE: (BUTYL ACETATE = 1)

X. STABILITY AND REACTIVITY

Stability: STABLE

Hazardous Decomposition Products: SULFURIC ACID: SULFUR TRIOXIDE, CARBON MONOXIDE, SULFURIC ACID MIST, SULFUR DIOXIDE, AND HYDROGEN.
 LEAD COMPOUNDS: HIGH TEMPERATURES LIKELY TO PRODUCE TOXIC METAL FUME, VAPOR, OR DUST; CONTACT WITH STRONG ACID OR BASE OR PRESENCE OF NASCENT HYDROGEN MAY GENERATE HIGHLY TOXIC ARSINE GAS.

Incompatible Products: SULFURIC ACID: CONTACT WITH COMBUSTIBLES AND ORGANIC MATERIALS MAY CAUSE FIRE AND EXPLOSION. ALSO REACTS VIOLENTLY WITH STRONG REDUCING AGENTS, METALS, SULFUR TRIOXIDE GAS, STRONG OXIDIZERS AND WATER. CONTACT WITH METALS MAY PRODUCE TOXIC SULFUR DIOXIDE FUMES AND MAY RELEASE FLAMMABLE HYDROGEN GAS.
 LEAD COMPOUNDS: AVOID CONTACT WITH STRONG ACIDS, BASES, HALIDES, HALOGENATES, POTASSIUM NITRATE, PERMANGANATE, PEROXIDES, NASCENT HYDROGEN AND REDUCING AGENTS.

Conditions To Avoid: PROLONGED OVERCHARGE; SOURCES OF IGNITION.

XI. TOXICOLOGICAL INFORMATION

XII. ECOLOGICAL INFORMATION

Ecotoxicity:

XIII. DISPOSAL CONSIDERATIONS

Disposal Method: SPENT BATTERIES: SEND TO SECONDARY LEAD SMELTER FOR RECYCLING. PLACE NEUTRALIZED SLURRY INTO SEALED CONTAINERS AND HANDLE AS APPLICABLE WITH STATE AND FEDERAL REGULATIONS. LARGE WATER-DILUTED SPILLS, AFTER NEUTRALIZATION AND TESTING, SHOULD BE MANAGED IN ACCORDANCE WITH APPROVAL LOCAL, STATE AND FEDERAL REQUIREMENTS. CONSULT STATE ENVIRONMENTAL AGENCY AND/OR FEDERAL EPA.

XIV. TRANSPORT INFORMATION

Other: U.S. DOT:
 ENERSYS BATTERIES THAT ARE CLASSIFIED AS NONSPILLABLE HAVE BEEN TESTED AND MEET THE NONSPILLABLE CRITERIA LISTED IN CFR 49, 173.159(d)(3)(i) AND (ii).
 NONSPILLABLE BATTERIES ARE EXPECTED FROM CFR 49, SUBCHAPTER C REQUIREMENTS, PROVIDED THAT THE FOLLOWING CRITERIA ARE MET:
 1. THE BATTERIES MUST BE PROTECTED AGAINST SHORT CIRCUITS AND SECURELY PACKAGED.
 2. EACH BATTERY AND THEIR OUTER PACKAGING MUST BE PLAINLY AND DURABLY MARKED "NONSPILLABLE" OR "NONSPILLABLE BATTERY".
 THE EXCEPTION FROM CFR 49, SUBCHAPTER C TRANSLATES TO NO PROPER

SHIPPING NAME, NO HAZARDOUS CLASS, NO UN NUMBER, NO PACKING GROUP AND NO HAZARDOUS LABELS WHEN TRANSPORTING A NONSPILLABLE BATTERY.

CONTACT YOUR ENERSYS REPRESENTATIVE FOR ADDITIONAL INFORMATION REGARDING THE CLASSIFICATION OF BATTERIES.

IATA:

ENERSYS BATTERIES THAT ARE CLASSIFIED AS NONSPILLABLE HAVE BEEN TESTED AND MEET THE NONSPILLABLE CRITERIA LISTED IN IATA PACKING INSTRUCTION 806 AND SPECIAL PROVISION A67. NONSPILLABLE BATTERIES MUST BE PACKED ACCORDING TO IATA PACKING INSTRUCTION 806. THESE BATTERIES ARE EXPECTED FROM ALL IATA REGULATIONS PROVIDED THAT THE BATTERIES' TERMINALS ARE PROTECTED AGAINST SHORT CIRCUITS. CONTACT YOUR ENERSYS REPRESENTATIVE FOR ADDITIONAL INFORMATION REGARDING THE CLASSIFICATION OF BATTERIES.

IMDG: ENERSYS BATTERIES THAT ARE CLASSIFIED AS NONSPILLABLE HAVE BEEN TESTED AND MEET THE NONSPILLABLE CRITERIA LISTED IN SPECIAL PROVISION 238. NON-SPILLABLE BATTERIES MUST BE PACKED ACCORDING TO IMDG PACKING INSTRUCTION P003. THESE BATTERIES ARE EXCEPTED FROM ALL IMDG CODE PROVIDED THAT THE BATTERIES' TERMINALS ARE PROTECTED AGAINST SHORT CIRCUITS PER PP16.

RCRA:

SPENT LEAD-ACID BATTERIES ARE NOT REGULATED AS HAZARDOUS WASTE BY THE EPA WHEN RECYCLED, HOWEVER STATE AND INTERNATIONAL REGULATIONS MAY VARY.

XV. REGULATORY INFORMATION

TSCA Status:

INGREDIENTS IN ENERSYS' BATTERIES ARE LISTED IN THE TSCA REGISTRY AS FOLLOWS:

ELECTROLYTE:

COMPONENTS: SULFURIC ACID(H-2SO4); CAS# 7439-92-1; TSCA STATUS: LISTED

INORGANIC LEAD COMPOUND:

LEAD(Pb); CAS# 7439-92-1; TSCA STATUS: LISTED

LEAD OXIDE(PbO); CAS# 1317-36-8; TSCA STATUS: LISTED

LEAD SULFATE(PbSO4); CAS# 7446-14-2; TSCA STATUS: LISTED

ANTIMONY(Sb); CAS# 7440-36-0; TSCA STATUS: LISTED

ARSENIC(As); CAS# 7440-38-2; TSCA STATUS: LISTED

CALCIUM(Ca); CAS# 7440-70-2; TSCA STATUS: LISTED

TIN(Sn); CAS# 7440-31-5; TSCA STATUS: LISTED.

EPA Sara Title III Chemical CERCLA (SUPERFUND) AND EPCRA:

Listings:

(a) REPORTABLE QUANTITY (RQ) FOR SPILLED 100% SULFURIC ACID UNDER CERCLA (SUPERFUND) AND EPCRA (EMERGENCY PLANNING COMMUNITY RIGHT TO KNOW ACT) IS 1000 LBS. STATE AND LOCAL REPORTABLE QUANTITIES FOR SPILLED SULFURIC ACID MAY VARY.

(c) EPCRA SECTION 302 NOTIFICATION IS REQUIRED IF 1000 LBS, OR MORE OF SULFURIC ACID IS PRESENT AT ONE SITE. THE QUANTITY OF SULFURIC ACID WILL VARY BY BATTERY TYPE.

(d) EPCRA SECTION 312 TIER 2 REPORTING IS REQUIRED FOR BATTERIES IF SULFURIC ACID IS PRESENT IN QUANTITIES OF 500 LBS, OR MORE AND/OR IF LEAD IS PRESENT IN QUANTITIES OF 10,000 LBS. OR MORE. (e) SUPPLIER NOTIFICATION: THIS PRODUCT CONTAINS TOXIC CHEMICALS, WHICH MAY BE REPORTABLE UNDER EPCRA SECTION 313 TOXIC CHEMICAL RELEASE INVENTORY (FORM R) REQUIREMENTS.

IF YOU ARE A MANUFACTURING FACILITY UNDER SIC CODES 20 THROUGH 39, THE FOLLOWING INFORMATION IS PROVIDED TO ENABLE YOU TO COMPLETE THE REQUIRED REPORTS:

TOXIC CHEMICAL: LEAD; CAS# 7439-92-1; APPROXIMATE % BY WT. 60.

TOXIC CHEMICAL: SULFURIC ACID; CAS# 7664-93-9; APPROXIMATE % BY WT. 10 - 30.

TOXIC CHEMICAL: *ANTIMONY; CAS# 7440-36-0; APPROXIMATE % BY WT. 2.

TOXIC CHEMICAL: *ARSENIC CAS# 7440-38-2; APPROXIMATE % BY WT. 0.2.

IF YOU DISTRIBUTE THIS PRODUCT TO OTHER MANUFACTURERS IN SIC CODES 20 THROUGH 39, THIS INFORMATION MUST BE PROVIDED WITH THE FIRST SHIPMENT OF EACH CALENDAR YEAR.

THE SECTION 313 SUPPLIER NOTIFICATION REQUIREMENT DOES NOT APPLY TO BATTERIES, WHICH ARE "CONSUMER PRODUCTS".

*NOT PRESENT IN ALL BATTERY TYPES.

Supplemental State

Compliance Information:

Other:

CAA:

ENERSYS SUPPORTS PREVENTATIVE ACTIONS CONCERNING OZONE DEPLETION IN THE ATMOSPHERE DUE TO EMISSIONS OF CFC'S AND OTHER OZONE DEPLETING CHEMICALS (ODC'S), DEFINED BY THE USEPA AS CLASS I SUBSTANCES. PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS (CAAA) OF 1990, FINALIZED ON JANUARY 19, 1993, ENERSYS ESTABLISHED A POLICY TO ELIMINATE THE USE OF CLASS I ODC'S PRIOR TO THE MAY 15, 1993 DEADLINE.

XVI. OTHER INFORMATION

WARRANTY INFORMATION

THIS INFORMATION IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.