

Appendix A: Environmental Impact Report

Table of Contents

<i>A. Materials Contained in Design</i>	1
<i>B. Materials Contained in Prototype</i>	1
C. Special Handling Instructions.....	1
D. Special Storage Instructions	2
E. Disposal Instructions	2

A. Materials Contained in Design

ALUMINUM EXTRUSIONS

The aluminum extrusion used for a majority of the robot hull is composed of extruded 6105-T5 aluminum. There are numerous recycling plants in Milwaukee which all buy scrap aluminum extrusions. Throughout the robot's construction and after the robot's life has ended all aluminum hull components will be salvaged.

TRACE METALS/ELEMENTS

Components used in the electrical design contain copper, silver, tungsten and silica. Electrical components should be recycled for reuse. These contained elements are not harmful to the environment.

LEAD

This element poses an environmental impact to water supplies and ecosystems. Organisms can be killed due to improper disposal of lead. Two different components of the system contain lead. The first component is lead acid batteries used to power the robot. These lead acid batteries must be recycled properly to reclaim the dangerous lead. The second component with lead is the solder used in the electrical connections. Components are connected together by a lead based solder. See the data sheets attached at the end of this appendix for material safety.

B. Materials Contained in Prototype

The materials contained in the prototype are identical to the materials in the design. The prototype and the final design are the same robot. See section A for the full list of materials.

C. Special Handling Instructions

The robot is intended for educational and demonstration purposes, primarily in classroom settings, and therefore is designed to be transported to various locations in the Milwaukee area. While the intent was to keep the robot fairly portable, given the size and weight of the robot, as

well as necessary components, such as the air compressor, it is ideal to utilize a cart when transporting the robot long distances, to reduce the possibility of damage to components in case of drops. Given that many components of the robot will rely on electricity, settings where the robot may come into direct contact with water, such as in rain, are to be avoided.

Before operating the robot, all systems must be confirmed to be functioning correctly. The robot should also be placed in an open area free of unintentional obstacles, including people, to minimize the likelihood of personal injury or damage to the robot's components. Being a user controlled robot, it is up to the users and observers to be vigilant in removing and avoiding obstacles when the robot is operated. Special care should be taken in being aware of the high pressure line running from the air compressor to the robot's onboard system, as it may be a tripping hazard, and to make sure it is not tangled during operation.

In the event of malfunction in the robot, there will be a stop button located on the robot to stop running operations in the robot and cause it to enter a stable position and an emergency stop located on the robot stopping all operations in the robot. In cases that the microcontroller is not malfunctioning, but other systems in the robot are, the stop button located on the robot should be utilized, however if the microcontroller is not accessible due to the malfunction, the emergency stop located on the robot should be utilized to stop all power flow to the robot's systems.

D. Special Storage Instructions

The robot has been designed to be stored with few special considerations, as the metal parts are non-corrosive, however should be stored in a clean, dry, moderate-temperature environment when not in use. To avoid possible personal injury or damage to the robot and its components, it is advised that when in storage, the robot is stored below head level when in a shelving unit, or on level ground if possible.

E. Disposal Instructions

All metal components should be recycled for reuse. All electrical components should be recycled as well. However, particular care of the lead acid batteries should be taken. Lead acid batteries must be recycled to reclaim the lead contained within.

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERY WET, FILLED WITH ACID

(US, CN, EU Version for International Trade)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Lead Acid Battery Wet, Filled With Acid
OTHER PRODUCT NAMES: Electric Storage Battery, SLI or Industrial Battery, UN2794

MANUFACTURER: East Penn Manufacturing Company, Inc.
DIVISION: Dekka 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: This product is a wet lead acid storage battery. May also include gel/absorbed electrolyte type lead acid battery types.

PRODUCT USE: Industrial/Commercial electrical 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 Labelling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labelling, 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 labelling.

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification:

Health	Environmental	Physical
Acute Toxicity – Not listed (NL) Eye Corrosion – Corrosive* Skin Corrosion – Corrosive* Skin Sensitization – NL Mutagenicity/Carcinogenicity – NL Reproductive/Developmental – NL Target Organ Toxicity (Repeated) – NL	Aquatic Toxicity – NL	NFPA – Flammable gas, hydrogen (during charging) CN - NL EU - NL

*as sulfuric acid

GHS Label: Lead Acid Battery, Wet

Symbols: C (Corrosive)



Hazard Statements

Contact with internal components may cause irritation of severe burns. Irritating to eyes, respiratory system, and skin.

Precautionary Statements

Keep out of reach of children. Keep containers tightly closed. Avoid heat, sparks, and open flame while charging batteries. Avoid contact with internal acid.

EMERGENCY OVERVIEW: May form explosive air/gas mixture during charging. Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin. Prolonged inhalation or ingestion may result in serious damage to health. Pregnant

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERY WET, FILLED WITH ACID

(US, CN, EU Version for International Trade)

women exposed to internal components may experience reproductive/developmental effects.

POTENTIAL HEALTH EFFECTS:

EYES: Direct contact of internal electrolyte liquid with eyes may cause severe burns or blindness.
SKIN: Direct contact of internal electrolyte liquid with the skin may cause skin irritation or damaging burns.
INGESTION: Swallowing this product may cause severe burns to the esophagus and digestive tract and harmful or fatal lead poisoning. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints.
INHALATION: Respiratory tract irritation and possible long-term effects.

ACUTE HEALTH HAZARDS:

Repeated or prolonged contact may cause mild skin irritation.

CHRONIC HEALTH HAZARDS:

Lead poisoning if persons are exposed to internal components of the batteries. Lead absorption may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints. Other effects may include central nervous system damage, kidney dysfunction, and potential reproductive effects. Chronic inhalation of sulfuric acid mist may increase the risk of lung cancer.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Respiratory and skin diseases may predispose the user to acute and chronic effects of sulfuric acid and/or lead. Children and pregnant women must be protected from lead exposure. Persons with kidney disease may be at increased risk of kidney failure.

Additional Information

No health effects are expected related to normal use of this product as sold.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENTS (Chemical/Common Names):</u>	<u>CAS No.:</u>	<u>% by Wt:</u>	<u>EC No.:</u>
Lead, inorganic	7439-92-1	43–70 (average: 65)	231-100-4
Sulfuric acid	7664-93-9	20–44 (average: 25)	231-639-5
Antimony	7440-36-0	0–4 (average: 1)	231-146-5
Arsenic	7440-38-2	<0.01	231-148-6
Polypropylene	9003-07-0	5–10 (average: 8)	NA
NA: Not applicable; ND: Not determined			

Additional Information

These ingredients reflect components of the finished product related to performance of the product as distributed into commerce.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush eyes with large amounts of water for at least 15 minutes. 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 breathing difficulties develop, remove person to fresh air. If symptoms persist, seek medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE/UNSUITABLE EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water, foam. Do not use water on live electrical circuits.

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID
(US, CN, EU Version for International Trade)

SPECIAL FIREFIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:

Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells. Avoid breathing vapours. Use full protective equipment (bunker gear) and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Batteries evolve flammable hydrogen gas during charging and may increase fire risk in poorly ventilated areas near sparks, excessive heat or open flames.

SPECIFIC HAZARDS IN CASE OF FIRE:

Thermal shock may cause battery case to crack open. Containers may explode when heated.

Additional Information

Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.

ENVIRONMENTAL PRECAUTIONS:

Prevent spilled material from entering sewers and waterways.

SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:

Add neutralizer/absorbent to spill area. 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

Lead acid batteries and their plastic cases are recyclable. Contact your East Penn representative for recycling information.

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING AND STORAGE:

- Keep containers tightly closed when not in use.
- If battery case is broken, avoid contact with internal components.
- Do not handle near heat, sparks, or open flames.
- Protect containers from physical damage to avoid leaks and spills.
- Place cardboard between layers of stacked batteries to avoid damage and short circuits.
- Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.

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:

Charge in areas with adequate ventilation.

VENTILATION:

General dilution ventilation is acceptable.

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.

SKIN PROTECTION:

Wear chemical resistant gloves as a standard procedure to prevent skin contact.

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

Wash Hands after handling.

EXPOSURE GUIDELINES & LIMITS:

OSHA Permissible Exposure Limit (PEL/TWA)

Lead, inorganic (as Pb)
Sulfuric acid

0.05 mg/m³
1.00 mg/m³

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERY WET, FILLED WITH ACID

(US, CN, EU Version for International Trade)

EXPOSURE GUIDELINES & LIMITS:

ACGIH	2007 Threshold Limit Value (TLV)	Antimony	0.50 mg/m ³	
		Arsenic	0.01 mg/m ³	
		Lead, inorganic (as Pb)	0.05 mg/m ³	
		Sulfuric acid	0.20 mg/m ³	
Quebec	Permissible Exposure Value (PEV)	Antimony	0.50 mg/m ³	
		Arsenic	0.01 mg/m ³	
		Lead, inorganic (as Pb)	0.15 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	TWA
Ontario	Occupational Exposure Level (OEL)		3.00 mg/m ³	STEV
		Antimony	0.50 mg/m ³	
		Arsenic	0.10 mg/m ³	
		Lead (designated substance)	0.10 mg/m ³	
Netherlands	Maximaal Aanvaarde Concentratie (MAC)	Sulfuric acid	1.00 mg/m ³	TWAEV
			3.00 mg/m ³	STEV
		Antimony	0.50 mg/m ³	
		Arsenic (designated substance)	0.01 mg/m ³	
Germany	Maximale Arbeitsplatzkonzentrationen (MAK)	Lead, inorganic (as Pb)	0.15 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	
		Lead, inorganic (as Pb)	0.10 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	TWA
United Kingdom	Occupational Exposure Standard (OES)		2.00 mg/m ³	STEL
		Antimony	0.50 mg/m ³	
		Lead	0.15 mg/m ³	
		Antimony	0.50 mg/m ³	
		Arsenic	0.10 mg/m ³	

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

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/m³ as total dust or 5 mg/m³ as respirable dust.
- May be required to meet Domestic Requirements for a Specific Destination(s).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Industrial/commercial lead acid battery
ODOUR:	Odourless
ODOUR THRESHOLD:	NA
PHYSICAL STATE:	Sulfuric Acid: Liquid; Lead: solid
pH:	<1
BOILING POINT:	235-240° F (113-116° C) (as sulfuric acid)
MELTING POINT:	NA
FREEZING POINT:	NA
VAPOUR PRESSURE:	10 mmHg
VAPOUR DENSITY (AIR = 1):	> 1
SPECIFIC GRAVITY (H₂O = 1):	1.27-1.33
EVAPORATION RATE (n-BuAc=1):	< 1
SOLUBILITY IN WATER:	100% (as sulfuric acid)
FLASH POINT:	Below room temperature (as hydrogen gas)
AUTO-IGNITION TEMPERATURE:	NA
LOWER EXPLOSIVE LIMIT (LEL):	4% (as hydrogen gas)
UPPER EXPLOSIVE LIMIT (UEL):	74% (as hydrogen gas)
PARTITION COEFFICIENT:	NA
VISCOSITY (poise @ 25° C):	Not Available

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID
(US, CN, EU Version for International Trade)

DECOMPOSITION TEMPERATURE: Not Available

FLAMMABILITY/HMIS HAZARD CLASSIFICATIONS (US/CN/EU): As sulfuric acid

HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 2

SECTION 10: STABILITY AND REACTIVITY

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

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):

Sulfuric acid: LD50, Rat: 2140 mg/kg
 LC50, Guinea pig: 510 mg/m³
Lead: No data available for elemental lead

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 abnormal conduction velocities in persons 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 over long 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.

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE & DEGRADABILITY:

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

BIOACCUMULATIVE POTENTIAL (Including Mobility):

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

AQUATIC TOXICITY (Test Results & Comments):

Sulfuric acid: 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)
Lead (metal): No data available

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:

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERY WET, FILLED WITH ACID

(US, CN, EU Version for International Trade)

HAZARDOUS WASTE

CLASS/CODE:

US - Not applicable to finished product as manufactured for distribution into commerce.
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

Not Included – **Recycle** or dispose as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

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

Proper Shipping Name	Batteries, Wet, Filled with Acid	ID Number	UN2794
Hazard Class	8	Labels	Corrosive
Packing Group	III		

AIRCRAFT – ICAO-IATA:

Proper Shipping Name	Batteries, Wet, Filled with Acid	ID Number	UN2794
Hazard Class	8	Labels	Corrosive
Packing Group	III		

Reference IATA packing instructions 870

VESSEL – IMO-IMDG:

Proper Shipping Name	Batteries, Wet, Filled with Acid	ID Number	UN2794
Hazard Class	8	Labels	Corrosive
Packing Group	III		

Reference IMDG packing instructions P801

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:

<u>Chemical</u>	<u>CAS #</u>
None	NA

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)

Chemicals present in the product which could require reporting under the statute:

<u>Chemical</u>	<u>CAS #</u>
Lead	7439-92-1
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.

<u>Chemical</u>	<u>CAS #</u>	<u>% wt</u>
Lead	7439-92-1	65
Sulfuric acid	7664-93-9	25

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 (Sulfuric acid is Corrosive)
Delayed Hazard	No

Note: Sulfuric acid is
Hazardous

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID
(US, CN, EU Version for International Trade)

listed as an Extremely
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:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
Arsenic (as arsenic oxides)	7440-38-2	<0.1
Strong inorganic acid mists including sulfuric acid	NA	25
Lead	7439-92-1	65

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 +/-or Ont. Reg. 127/01:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
Lead	7439-92-1	65
Sulfuric acid	7664-93-9	25

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.

<u>R-Phrases</u>	<u>S-Phrases</u>
35, 36, 38	1/2, 26, 30, 45

Additional Information

This product may be subject to Restriction of Hazardous Substances (RoHS) regulations in Europe and China, or may be regulated under 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.

Sources of Information:

International Agency for Research on Cancer (1987), *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France.*

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: **30 April 2013**

SUPERCEDES: **16 December 2011**

DISCLAIMER:

This Material Safety Data Sheet is based upon information and sources available at the time of preparation or revision date. The 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

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID
(US, CN, EU Version for International Trade)

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

Material Safety Data Sheet

RadioShack

Cat. No. 64-035 [E]

1. Manufacturer Information

Manufacturer Address/Telephone/Fax : Ku Ping Enterprise Co., Ltd.
TEL : 8862-8201-3987/88/89 No. 5, Lane 302, Hsin-shuh Road,
FAX : 8862-8201-2368-(2388) Hsin-Chuang City, Taipei Hsien, Taiwan

2. Product Ingredients

Chemical Characteristi s: Sn62/Pb36/Ag2 wire, with flux core, no odor			
Hazardous Material Classification and Figure : CONTAINS LEAD - HARMFUL CONTAINS ROSIN - IRRITANT		G	
Hazardous Ingredients Name	WT%	C.A.S. Number	Organic Standard
Tin / SN	60-64(see product marking)	7440-31-5	Not Applicable
Lead / PB	36-40(see product marking)	7439-92-1	Not Applicable

3. Health Hazard Information

The most hazardous condition: Exposure to flux fumes during use of the product, ingestion of lead metal
Symptoms and effects: Eye irritation, headache, and irritation of the respiratory system

4. Emergency First Aid

Different routes of entry : Eyes, Inhalation, Ingestion
Inhalation : Remove person from exposure to fumes and restore breathing if necessary
Skin contact : Wash thoroughly with soap and water
Eye contact : Flush eyes with plenty of water and get medical attention
Ingestion : Induce vomiting and get prompt medical attention
The most serious symptom : Dizziness, nausea from flux fumes
Protective measurements : Flux concentration in air, Measurement of blood lead content.
Medical Conditions : Chemical hypersensitivity, pre-existing conditions of the lungs

5. Fire and Explosion Hazard Data

Extinguishing Media : CO₂ Chemical powder, Bubble type Extinguisher, Water
The hazard when extinguishing : Flux in cored wire solder may ignite when the solder melts in a fire.
Special firefighting procedures : Wear self-contained breathing apparatus if this material is in the vicinity of a fire.
Protective measures for firefighting man : None recommended
Hazard rating : Health: 1 Flammability: 2 Reactivity: 0

6. Procedures if material is spilled or released

Precautions for person : Wash hands with soap and water after handling solder wire. Do not breathe the fumes during sold

Precautions for environment : Solder can be reclaimed
Steps to be taken if material is spilled or released : Not applicable, material is metal wire.

7. Precautions to be taken in handling and storage

Handling : Avoid breathing smoke/fumes generated during soldering. Wash hands after handling solder metal.
Storage : Store in low humidity area to minimize tarnishing.

8. Protective measures against exposure

Material engineering control : Provide adequate exhaust ventilation (general and/or local) if necessary to meet exposure requirements. Local ventilation is preferred to minimize dispersion of smoke/fumes into the work area.		
Control parameters		
Average allowable concentration when 8 hours running TWA	Average allowable concentration when Short-time running STEL	The highest concentration allowed CEILING
Sn : 2.0mg/m ³ ; Pb : 0.05mg/m ³	Sn : 2mg/m ³ ; Pb : 0.15mg/m ³	Sn : 58.2mg/m ³ ; Pb : 38.8mg/m ³
Protective Measures Respiratory Protection : When ventilation is not sufficient to remove fumes from the breathing zone, a safety approved respirator should be worn. Protective gloves : Usually not required Eye protection : When soldering, use goggles or face shield Other protective clothing and equipment : None recommended Hygienic work practices : Wash hands thoroughly after handling chemicals or solder.		

9. Physical and Chemical Data

Material state : Solid	Appearance : Silver-gray metal wire
Color : Silver-gray metal wire	Odor : None
pH : Not applicable	Melting point : 183°C (361°F)
Decomposition temperature : None	Flash Point : Not applicable
Auto-ignition temperature : Not applicable	Exposure limit : Not determined
Vapor pressure : Not applicable	Vapor density : Not applicable
Specific gravity water : 1	Solubility : None in water

10. Stability and Reactivity

Stability : Stable under all conditions
Probably hazard effect under special condition : None known
Condition to avoid : Heat, Flame, Wet and soaking
Materials to avoid : Strong acids, strong oxidizing materials
Hazardous decomposition products : When heated to soldering temperatures, the fumes may contain rosin and thermal degradation products such as aliphatic aldehydes and acids.

11. Ecological Data

Probable effect to environment :
Long term degradation products are possible.

12. Waste Disposal

Waste disposal method : Solder metal can be recycled by reclamation.

13. Delivery Information

International delivery regulation : LATA-Dangerous Goods Regulation, Not restricted

UN code : Not regulated

Domestic delivery regulation : None known

Special delivery method and precaution : None known

14. Law and Regulation

Conform to regulation : 1. Labor Safety & Sanitary Device Regulation

2. Standards for the density of hazardous materials in labor working environment

3. Identification rules for hazardous and harmful materials

4. Standards for waste disposal treatment and facility requirement

5. Road traffic safety rules

15. Additional Information

Reference : MSDS database, CCINFO CD 98-2, NIOSH/OSHA, Occupational Health

Guidelines for Chemical Hazards, 1981

Prepared by : Tony Yang

Date : Feb. 15, 2008

Remark : These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.