

SHENZHEN TIANYUE NEW ENERGY CO., LIMITED

MATERIALS SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sealed Lead Acid Battery
Common Synonyms: Valve regulated lead acid battery
DOT Description: Battery, wet, filled with acid
Chemical Family: Engine Starting or Power Back-up
Address: Rm8032, Jincheng Commercial Building, No. 201 Lixin Road South, Bao'an District, Shenzhen, China
Contact: +86-136 4141 6595
Emergency Number: +86-18607557047

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SECTION 2: HAZARDOUS INGREDIENTS

Components	Approx. % by Weight	CAS Number	Air Exposure Limits ($\mu\text{g}/\text{m}^3$)			LD50 ORAL (Rat) (mg/kg)
			ACGIH TLV-TWA	OSHA PEL	NIOSH REL	
Inorganic Lead	60-70	7439-92-1	50	50	50	500
Calcium(Ca)	0.01-0.03	7440-70-2	1000	1000	--	--
Tin(Sn)	0.17-0.20	7440-31-5	2000	2000	2000	--
Antimony(Sb)	0.15-0.17	7440-36-0	500	500	--	7000
Aluminum(Al)	<0.006	7429-90-5	10000	5000	5000	--
Arsenic(As)	<0.007	7440-38-2	10	10	==	763
Dilute Sulfuric Acid	25-30	7664-93-9	200	1000	1000	2140
Caser Material: Acrylonitrile Butadiene Styrene(ABS)	~5	9003-56-9	--	--	--	--

SECTION 3: PHYSICAL DATA

Components	Density g/cm^3	Melting/Boiling (M/B) Point	Solubility (H2O)	Odor	Appearance
Lead	11.34	327.46°C/621.43°F(M)	None	None	Silver gray metal
Lead Sulfate	6.20	1170°C/2138°F(M)	40mg/l (15°C/59°F)	None	White crystals or powder
Lead Dioxide	9.40	290°C/554°F(M)	None	None	Dark brown powder
Sulfuric Acid	~1.28	95-115°C/203-240°F(M)	100%	Sharp, penetrating, pungent odor	Clear colorless liquid

Acrylonitrile Butadiene Styrene(ABS)	1.04-1.06	101-170°C/214- 338°F(M)	None	None	White Solid
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SECTION 4: FLAMMABILITY DATA

Components	Flashpoint	Explosive Limits	Comments
Lead	None	None	None
Sulfuric Acid	None	None	None
Hydrogen	--	LEL=4.1% UEL=75%	Sealed batteries can emit hydrogen only if over charged (voltage>2.41VPC). The gas enters the air through the flame arrestor. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery. Extinguishing Media: Dry chemical, foam, CO2
Acrylonitrile Butadiene Styrene(ABS)	None	20g/cm ³	Temperatures over 380°C (716°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus.

SECTION 5: REACTIVITY DATA

COMPONENT	Lead/Lead Compounds
Stability	Stable
Incompatibility	Potassium, carbides, sulfides, peroxides, phosphorus, sulfurs ketone, ester, petrolatum
Decomposition products	Oxides of lead and sulfur
Condition to avoid	High temperature, sparks and other sources of ignition
COMPONENT	Sulfuric Acid
Stability	Stable
Incompatibility	Reactive metals, strong bases, most organic compounds
Decomposition products	Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen
Condition to avoid	Prohibit smoking, sparks, etc from battery charging area. Avoid mixing acid with other chemicals.
Polymerization	Sulfuric acid will not polymerize

SECTION 6: HEALTH HAZARD DATA

Battery is considered as sealed non-spillable one. Under normal operating conditions, the materials sealed inside should not be hazardous to people's health. Only when these materials exposed during production or under case broken condition or being extremely heated (fired), they may be hazardous to people's health.

<p>Routes of Entry: <u>Sulfuric Acid:</u> Harmful by all routes of entry. <u>Lead Compounds:</u> Hazardous exposure can occur only when product is heated, oxidized. Or otherwise processed or damaged to create dust, vapor or fume.</p>
<p>Inhalation: <u>Sulfuric Acid:</u> breathing sulfuric acid vapors and mists may cause severe respiratory problem. <u>Lead Compounds:</u> Dust or fumes may cause irritation of upper respiratory tract or lungs.</p>

Skin Contact:

Sulfuric Acid: Severe irritation, burns and ulceration.

Lead Compounds: Not absorbed through the skin.

Eye Contact:

Sulfuric Acid: Severe irritation, burns, cornea damage, blindness.

Lead Compounds: Dust, vapor or fume may cause irritation.

Ingestion:

Sulfuric Acid: May cause severe irritation of the mouth, throat, esophagus and stomach.

Lead Compounds: May cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. Acute ingestion should be treated by a physician.

Acute Health Hazards:

Sulfuric Acid: Severe skin irritation, burns, damage to cornea may cause blindness, upper respiratory irritation.

Lead Compounds: May cause abdominal pain, nausea, headaches, vomiting, loss of appetite, severe cramping, muscular aches and weakness, and difficulty in sleeping. The toxic effects of lead are cumulative and slow to appear. It affects the kidneys, reproductive and central nervous systems. The symptoms of lead overexposure are listed above. Exposure to lead from a battery most often occurs during lead reclamation operations through the breathing or ingestion of lead dust or fumes.

Chronic Health Hazards:

Sulfuric Acid: Possible scarring of the cornea, inflammation of the nose, throat and bronchial tubes, possible erosion of tooth enamel.

Lead Compounds: May cause anemia, damage to kidneys and nervous system, and damage to the reproductive system in both males and females.

Medical Conditions Generally Aggravated by Exposure

Inorganic lead and its compounds can aggravate chronic forms of kidney, liver and neurological diseases. Contact of battery electrolyte (acid) with the skin may aggravate skin diseases such as eczema and contact dermatitis. Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions.

Emergency and First Aid Procedures**Inhalation**

Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen.

Lead Compounds: Remove from exposure, gargle, wash nose and lips, consult physician.

Ingestion

Sulfuric Acid: Do not induce vomiting, consult a physician immediately.

Lead Compounds: Consult a physician immediately

Eyes

Sulfuric Acid: Flush immediately with water for 15 minutes, consult a physician.

Lead Compounds: Flush immediately with water for 15 minutes, consult a physician.

Skin

Sulfuric Acid: Flush with large amounts of water for at least 15 minutes, remove any contaminated clothing. If irritation develops seek medical attention.

Lead Compounds: Wash with soap and water.

Proposition 65

Warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemical 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.

SECTION 7: CARCINOGENICITY

Carcinogenicity

Sulfuric Acid: The National Toxicological Program (NTP) and The International Agency for Research on Cancer (IARC) have classified strong inorganic acid mist containing sulfuric acid as Category 1 carcinogen, a substance that is carcinogenic to humans. The ACGIH has classified strong inorganic acid mist containing sulfuric acid as an A2 carcinogen (suspected human carcinogen). These classifications do not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained with 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 result in the generation of the sulfuric acid mist.

Lead Compounds: Human studies are inconclusive regarding lead exposure and an increased cancer risk. The EPA and the International Agency for Research on Cancer (IARC) have categorized lead and inorganic lead compounds as B2 classification (probable/possible human carcinogen) based on sufficient animal evidence and inadequate human evidence.

SECTION 8: PRECAUTIONS FOR SAFE HANDLING AND USE

Spill or Leak Procedures

In case the release occurs, stop flow of material: contain/absorb small spills with dry sand, earth, and vermiculite. 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.

Waste Disposal Method

Spent Batteries—send to secondary lead smelter for recycling. Follow applicable federal, state and local regulations. Neutralize as in preceding step. Collect neutralized material in sealed container and handle as hazardous waste as applicable. A copy of this MSDS must be supplied to any scrap dealer or secondary lead smelter with the battery. Or, consult state environment agency and/or federal EPA.

Handling and Storing

Store batteries in a cool, dry, well ventilated area that are separated from incompatible materials and any activities which may generate flames, sparks, or heat. Keep away from all metallic articles that could contact the negative and positive terminals on the battery and create a short circuit condition. Battery should be stored under roof for protection against adverse weather conditions. Store and handle only in areas with adequate water supply and spill control. Avoid damage to the battery case.

Electrical Safety

Due to the battery's low internal resistance and high power density, high levels of short circuit current can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only. Follow all installation instructions and diagrams when installing or maintaining battery systems.

SECTION 9: ECOLOGICAL INFORMATION

Lead and its compounds can pose a threat if released to the environment. See Waste Disposal Method in Section 8

SECTION 10: CONTROL MEASURES

Engineering Controls:

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid resistant

Work Practices:

Handle batteries cautiously to avoid damaging the case. Avoid contact with internal components. Do not allow metallic articles to contact the battery terminals during handling.

Respiratory Protection:

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use

NIOSH or MSHA-approved respiratory protection.

Personal Protection and Equipment:

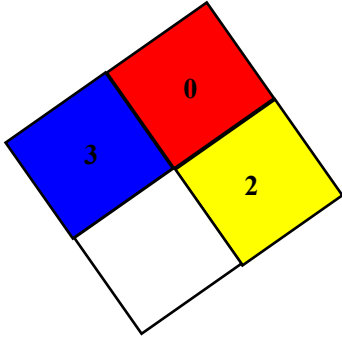
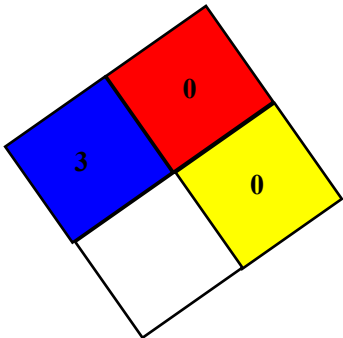
None need under normal conditions. If battery case is damaged,

- Protective gloves: use rubber or plastic acid-resistant gloves with elbow-length gauntlet.
- Eye protection: use chemical goggles or face shield.
- Other protection: acid-resistant apron. Under severe exposure or emergency conditions, wear acid-resistant clothing and boots.
- In areas where sulfuric acid is handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

SECTION 11: NFPA HAZARD RATING

A. Not applicable under normal conditions

B. In case of damage resulting in breakage of the battery container, see Section 10, Personal Protection and Equipment

Sulfuric Acid	Lead Compounds
Flammability (Red)—0 Health (Blue)—4 Reactivity (Yellow)—2	Flammability (Red)—0 Health (Blue)—3 Reactivity (Yellow)—0
	

SECTION 12: TRANSPORTATION REGULATIONS (Non-Restricted Status)

IATA DGR (61th Edition):

Our non-spillable lead acid batteries are not restricted to IATA DGR according to special provision A123.

IMO-IMDG Code:

Our lead acid batteries are not restricted to IMO IMDG Code.

SECTION 13: REGULATORY INFORMATION

Manganese Dioxide Battery is unregulated for purpose of transportation by U.S Department of Transportation (DOT), International Civil Aviation Administration (ICAA), International Air Transport Association (IATA) and the International Maritime Dangerous Goods regulations (IMDG). The requirements for shipping these batteries, in all modes of transportation, are that they should be separated from each other to prevent short-circuits and prevent

movement that could lead to short-circuits. Products must also be packed in strong packaging that can withstand the rigors normal to transportation.

DISCLAIMER:

All persons using this product, all persons working in an area where this product is used and all persons handling this product should be familiar with the contents of this data sheet. This information should be effectively communicated to the employees and others who might come in contact with the product.

This material safety data sheet is based upon information and sources available at the time of preparation or revision date. We do not assure responsibility and disclaim liability for loss, damage or expense in any connected with the handling, storage, use of, or disposal of the product. For additional information concerning our products or questions concerning the content of this MSDS, please contact us.