



GS YUASA INTERNATIONAL LTD. GROUP
PRESIDENT GROUP

MATERIAL SAFETY DATA SHEET

Value Regulated Lead Acid Battery Series

Section I : Chemical Product and Company Identification

Product Identity :

Sealed Lead Acid Battery

Trade Name :

GS PE、PX、PXL、PWL、SPV、LEV、TEV Series
Valve Regulated Lead-Acid Batteries

Distributor :

Ztong Yee Industrial CO., LTD.

999 Chung Cheng N. Rd., Yeong Kang City Tainan Country Taiwan

Manufacturer :

Ztong Yee Industrial CO., LTD.

Toll Free : 0800-612-011

999 Chung Cheng N. Rd., Yeong Kang City Tainan Country Taiwan

<http://www.gy-zyi.com.tw>

Section II : Hazardous Ingredients / Identity Information

Component	Chemical Name	Approximate % by wt. or vol.	OSHA PEL	ACGIH TLV	CAS#
Lead	Pb	50~55 wt%	0.05mg/m ³	0.15mg/m ³	7439-921
Lead Oxide	PbO ₂	20~24%	0.05mg/m ³	0.15mg/m ³	1309-600
Lead Sulfate	PbSO ₄	<1% wt	0.05mg/m ³	0.15mg/m ³	7446-142
Sulfuric Acid	H ₂ SO ₄	15~20 wt%	1.0mg/m ³	1.0mg/m ³	7664-939

Percentages of components are dependant both on the model of the battery and state of charge/discharge of the battery.

Overall Chemical Reaction : $\text{PbO}_2 + \text{Pb} + 2\text{H}_2\text{SO}_4 \rightleftharpoons 2\text{PbSO}_4 + 2\text{H}_2\text{O}$

Note : Sealed Lead Acid batteries are a sealed , non-spillable design. Under normal use and handling the customer has no contact with the internal components of the battery or the chemical hazards. Under normal use and handling these batteries do not emit regulated or hazardous substance. Wash hands thoroughly after working with batteries and before eating , drinking or smoking.



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Section III : Physical/Chemical Characteristics

Components	Boiling Point	Melting Point	Solubility in Water	Specific Gravity	Appearance	Odor
Lead	Greater than 1200°C	327.4°C	Insolubility in Water	11.34	Silver - Gray Metal	None
Lead Dioxide	N/A	290°C	N/A	2.4	Brown Powder	None
Lead Sulfate	N/A	1170°C	40 mg/l (15°C)	6.2	White Powder	None
Sulfuric Acid	110~112°C	N/A	100%	1.33	Clear colorless liquid	Acidic

HEALTH HAZARD DATA :

Lead : The toxic effects of lead are accumulative and slow to appear. It affects the kidneys reproductive and central nervous system. The symptoms of lead overexposure are vomiting , headache , stomach pain (lead colic) , dizziness , loss of appetite , and muscle and joint pain. Exposure to lead from a battery most often occurs during lead reclaim operations through the breathing or ingestion of lead dust and fume .

Sulfuric Acid : Sulfuric acid is a strong corrosive contact with acid can cause burn on the skin and in eyes. Acid can be released if the battery case is damaged or if the vents are tampered with .



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Section IV : Emergency and First Aid Procedures

Sulfuric acid precautions :

- Inhalation : Remove to fresh air. Give oxygen or artificial respiration if needed. Get immediate medical attention.
- Skin contact : Remove contaminated clothing and flush affected areas with plenty of water for at least 15 minutes.
- Eye contact : Flush with plenty of water at least 15 minutes. Get immediate medical attention.
- Ingestion : Dilute by giving large quantities of water. If available give several glasses of milk. Do not give anything by mouth to an unconscious person.

Section V : Fire and Explosion Hazard Data

- Flash Point : Not Applicable
- Flammable Limits : LEL = 4.1% (Hydrogen Gas in air) UEL = 74.2%
- Extinguishing media : CO₂ foam : dry chemical

Special Fire Fighting Procedures :

If batteries are on charge • turn off power. Use positive pressure • self-contained breathing apparatus in fighting fire. Water applied to electrolyte generates heat and causes it to spatter. Wear acid resistant clothing.

Unusual Fire and 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.



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Section VI : Reactivity Data

Stability : Stable under normal conditions.

Conditions to avoid : Sparks and other sources of ignition. Prolonged overcharge. Fire or explosion hazard due to possible hydrogen gas generation.

Incompatibility : Combination of sulfuric acid with combustibles and organic material may cause fire and explosion. Avoid strong reducing agents , most metals , carbides , chlorates , nitrates , picrate.

Hazardous Decomposition Products :

Hydrogen gas may be generated in an overcharged condition , in fire or at very high temperatures. CO , CO₂ and sulfur oxides may emit in fire.

Section VII : Precautions for Safe Handling and Use

Steps to be taken in case of broken battery case or electrolyte leakage : Neutralize any electrolyte or exposed internal battery parts with soda ash (sodium bicarbonate) until fizzling stops. Keep untrained personnel away from electrolyte and broken battery. Place broken battery and clean-up materials in a plastic bag or non-metallic container. Dispose of clean-up materials as a hazardous waste. Ventilate area as hydrogen gas may be given off during neutralization.

Waste disposal method :

Spent batteries : Send to secondary lead smelter for recycling.

Place Neutralized slurry in sealed containers and dispose of as hazardous waste , as applicable. Large water-diluted spill , after neutralization and testing , should be managed in accordance with local , state and federal requirements. Consult state environmental agency and/or federal EPA.



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Handling and Storage : 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.

Section VIII : Control Measures/Personal Protection

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 spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing when filling and handling batteries.

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.

Protective Gloves : Rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection : Chemical goggles or face shield.

Section IX : Other Regulatory Information

NFPA Hazard Rating for sulfuric acid :

Flammability (Red) = 0

Health (Blue) = 3

Reactivity (Yellow) = 2

Sulfuric acid is water-reactive if concentrated.



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Our product are sealed (valve regulated) non-spillable lead-acid batteries with pasted lead-calcium plates. The electrolyte is held captive in an Absorbed Glass Mat (AGM) separator between plates that immobilize the electrolyte in the cell. AGM separator material is a highly porous · absorbent micro fiberglass mat mixed with polymer fibers. There is no "free" electrolyte to leak out if the cell is tipped over (cell case and cover are sealed together) or if the cell is punctured. The AGM separator material immobilizes the electrolyte and creates a situation where the spill of electrolyte is highly unlikely. Typical accidents where a battery case is punctured results in a slight drip or a slow ooze of material out of the cell that cannot be characterized as a spill.

VRLA batteries are also different conversation unsealed cells because they contain only a minimum amount of electrolyte. VRLA battery electrolyte is a dilute mixture of sulfuric acid in water · which typically has a specific gravity between 1.280 and 1.330. Specific Gravity is a measure of the density of a liquid as compared to that of water. Which has a specific gravity of 1.000. Pure sulfuric acid has a specific gravity 1.840.

General Product Description - VRLA Batteries

During normal battery installation · operation and maintenance · the user has NO contact with internal components of the battery of its internal hazardous chemicals.

Our batteries are UL recognized under the file number :

ZTONG YEE INDUSTRIAL CO.,LTD. File# : MH13567 · Vol 1



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U.S. DOT

GS Batteries has been tested and meet the non-spillable criteria listed in CFR 49 · 173.159 (d) (3) (i) and (ii) . Non-spillable batteries are excepted from CFR 49 · Subchapter C requirement , provided that the following criteria are met :

- 1.The batteries must be protected against short circuits and securely packaged.
- 2.The batteries and their outer packaging must be plainly and durably marked "NON - SPILLING" or "NON - SPILLABLE 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 non-spillable battery.

IATA

GS Batteries has been tested and meet the non-spillable criteria listed in IATA Packing Instruction 806 and Special Provision A67. Non-spillable batteries must be packed according to IATA Packing Instruction 806 and Special Provision A67. The shipping information for non-spillable batteries is as follows :

Proper Shipping Name :	Batteries , wet , non-spillable
Hazardous Class :	8
UN Identification :	UN 2800
Packing Group :	III
Label / Placard Required :	Corrosive

In addition , these batteries are excepted from all IATA regulations provided that the batteries' terminals are protected against short circuits.

IMDG

GS Batteries has been tested and meet the non-spillable criteria listed on page 8121. Non-spillable batteries must be packed according to IMDG page 8121. The shipping information for non-spillable batteries is as follows :



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Proper Shipping Name : Batteries · wet · non-spillable
Hazardous class : 8
UN Identification : UN 2800
Packing Group : III
Label / Placard Required : Corrosive

In addition, these batteries are excepted from all IMDG code provided that the batteries' terminals are protected against short circuits.

RCRA : Spent lead-acid batteries are not regulated as hazardous waste by the EPA when recycled · however state and international regulations may vary.

CERCLA and EPCRA

- (a) Reportable Quantity (RQ) for 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency planning Community Right to Know Act) is 1,000 lbs. State and local reportable quantities for spilled sulfuric acid may vary.
- (b) sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA · with a Threshold Planning Quantity (TPQ) of 1,000 lbs
- (c) 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.
- (d) 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	CAS Number	Approximate % by Wt.
Lead	7439-921	60
Sulfuric Acid	7664-939	20



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Toxic Chemical	CAS Number	Approximate % by Wt.
Antimony	7440-360	<0.1
Arsenic	7440-382	<0.1

TSCA

Ingredients in GS's batteries are listed in the TSCA Registry as follows :

Components	CAS Number	TSCA Status
Lead (Pb)	7439-921	Listed
Lead Oxide (PbO)	1317-368	Listed
Lead Sulfate (PbSO ₄)	7446-142	Listed
Antimony (Sb)	7440-360	Listed
Arsenic (As)	7440-382	Listed
Calcium (Ca)	7440-702	Listed
Tin (Sn)	7440-315	Listed

Revised : 1. Apr. 2007

Preparer : Quality Guarantee Dept.