



SHENZHEN RITAR POWER CO.,LTD
MATERIAL SAFETY DATA SHEET

Product: Sealed Lead-Acid battery (AGM-Gel combination Battery)

Description: Batteries, sealed, maintenance-free, non-spillable.

UN No: 2800	IATA:	Not restricted for air transport-complies Special Revision A67
Package group: III	IMO:	Not classified as of 1922
	Required Label	NON-SPILLABLE
Unrestricted U.S.A. shipment. Complies with IATA/ICAO Special Provision A67 for air transport. Recognized by DOT as "Dry Charge"49 CFR 171-189 for surface transport. Classified per MG Amendment 27 as a non-hazardous material for water transport		

Hazardous components

Item	%W _t	CSHAPEL (TLV)	LD50 Oral	LD50 Inhalation	LD50 Contact
Lead(Pb,PbO ₂ ,PbSO ₄)	70%	0.050mg/m ³	<500mg/kg	<20mg/m ³	n/a
Gel	20%	1mg/m ³	2.135mg/kg	17mg/m ³	130mg/kg
Fiberglass separator	5%	—	—	—	—
ABS	5%	—	—	—	—

Physical Data

Component	Density	Melting Points	Solubility in Water	Odor	Appearance
Lead	11.34	327°C	None	None	Grey metal
Lead sulfate	6.2	107°C	40mg/L(15°C)	None	White powder
Lead dioxide	9.4	290°C	None	Acidic	Brown powder
Gel	1.300(20°C)	N/A	None	None	Colorless solid
Fiberglass Separator	N/A	N/A	Slight	None	White Membrane
ABS	N/A	N/A	None	None	Solid plastics

Flammability Data

Component	Flashpoint	Explosive limits	Comments
Lead	None	None	
Gel	N/A	None	
Hydrogen		4%	Produced only if the battery be over charged
Fiberglass separator	None	N/A	
ABS		N/A	

Health Hazard Information

Under normal operating conditions, the internal material will not be hazardous to your health. Only internally exposed material during production or case breakage or extreme heat (fire) may be hazardous to your health.

Routes of Entry:

- Installation: Acid mist from formation process may cause respiratory irritation.
- Skin Contact: Acid may cause irritation, burns and/or ulceration.
- Skin Absorption: Not a significant route of entry.
- Eye Contact: Acid may cause sever irritation, burns, cornea damage and/or blindness.
- Ingestion: Acid may cause irritation of mouth, throat, esophagus and stomach.

Sign and Symptoms of Over Exposures:

Acute Effects:

Over exposure to lead may lead to loss of appetite, constipation, sleeplessness and fatigue. Over exposure to acid may lead to skin irritation, corneal damage of the eyes and upper respiratory system.

Chronic Effects:

Lead and its components may cause damage to kidneys and nervous system. Acid and its components may cause lung damage and pulmonary conditions.

Potential to Cause Cancer:

The International Agency for Research on Cancer has classified "strong inorganic acid mist containing sulfuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist is not generated under normal use of this product. Misuse of the product, such as overcharging, may however result in the generation of sulfuric acid mist.

Emergency and First Aid Procedures:

- Inhalation: Remove from exposure and apply oxygen if breathing is difficult.
- Skin: Wash with plenty of soap and water. Remove any contaminated clothing.
- Eyes: Flush with plenty of water immediately for at least 15 minutes. Consult a physician.
- Ingestion: Consult a physician immediately.

FIRE AND EXPLOSION HAZARD DATA:

Flash Point:

Hydrogen = 259 °C

Auto ignition Temperature:

Hydrogen = 580 °C

Extinguishing Media:

Dry Chemical, foam, CO2

Unusual Fire and Explosion Hazards:

Hydrogen and oxygen gases are produced in the cells during normal battery operation (hydrogen is flammable and oxygen supports combustion). These gases enter the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery.

REACTIVITY DATA:

Stability:

Stable

Conditions to Avoid: Sparks and other sources of ignition.

Incompatibility: (materials to avoid)

Lead/lead compounds:

Potassium, carbides, sulfides, peroxides, phosphorus, sulfur.

Hazardous Decomposition Products:

Lead/lead compounds:

Oxides of lead and sulfur.

Conditions to Avoid:

High temperature. Battery electrolyte (acid) will react with water to produce heat. Can react with oxidizing or reducing agents.

CONTROL MEASURES:

Engineering Controls:

Store lead/acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.

Work Practices:

Do not remove vent caps. Follow shipping and handling instructions are applicable to the battery type. To avoid damage to terminals and seals, do not double-stack industrial batteries.

PERSONAL PROTECTIVE EQUIPMENT:

Respirator:

Protective equipment must be worn if the battery is cracked or otherwise damaged. HEPA respirator required for operations. If the OSHA PEL is exceeded.

Eye safety: Goggles, face shield.

Electrical safety: Due to the low internal resistance of power batteries and high power density, high levels of shock developed across the battery terminals. Do not rest tools or cables on the battery use insulated tools only follow an diagrams when installing or maintaining battery systems

1. Respiratory Protection:

None required under normal handling conditions. During battery formation (high-rate charge condition), acid mist can be generated which may cause respiratory irritation. Also, if acid spillage occurs in a confined space, exposure may occur. If irritation occurs, wear a respirator suitable for protection against acid mist.

2. Eyes and Face:

Chemical splash goggles are preferred. Also acceptable are "visor-gogs" or a chemical face shield worn over safety glasses.

3. Hands, Arms, Body:

Vinyl coated, VC, gauntlet type gloves with rough finish are preferred.

4. Other Special Clothing and Equipment:

Safety shoes are recommended when handling batteries. All footwear must meet requirements of ANSI Z41.1 – Rev. 1972.

5. Electrical safety:

Due to the low internal resistance of power batteries and high power density, high levels of shorn developed across the battery terminals. Do not rest tools or cables on the battery use insulated tools only follow an diagrams when installing or maintaining battery systems

PRECAUTIONS FOR SAFE HANDLING AND USE:

1. Hygiene Practices:

Following contact with internal battery components, wash hand thoroughly before eating, drinking, or smoking.

2. Respiratory Protection:

Wear safety glasses. Do not permit flames or sparks in the vicinity of battery(s). If battery electrolyte (acid) comes in contact with clothing, discard clothing.

3. Protective Measures:

5. a. Remove combustible materials and all sources of ignition. Cover sills with soda ash (sodium carbonate) or quicklime (calcium oxide). Mix well. Make certain mixture is neutral then collect residue and place in a drum or other suitable container. Dispose of a hazardous waste.

Transportation :

1. Acceptable modes of transport Rail, Road , Water and Air.
2. Batteries must be protected so as to prevent short circuit and must be securely packed and marked on the container "Non-Spillable"



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MATERIAL SAFETY DATA SHEET 原材料安全性数据表

Product Name: AGM SEALED LEAD ACID BATTERY 密封型铅酸蓄电池
Date: June. 1, 2006

SECTION 1: HAZARDOUS COMPONENTS 第1部分: 有毒元件

COMPONENTS 成分	%WEIGHT 所占比重	TLV	LD50 ORAL	LC50 INHALATION	LC50 CONTACT
Lead 铅(Pb, PbO ₂ , PbSO ₄)	About 大约 70%	N/A (无效)	(500) mg/Kg	N/A	N/A
Sulfuric Acid 硫酸	About 20%	1 mg/m ³	(2.140) mg/Kg	N/A	N/A
Fiberglass Separator 玻璃纤维隔板	About 5%	N/A	N/A	N/A	N/A
ABS or PP ABS 或 PP	About 5%	N/A	N/A	N/A	N/A

SECTION 2: PHYSICAL DATA 第2部分: 物理数据

COMPONENTS 成份	DENSITY 密度	MELTING POINT 化点	SOLLUBILITY 溶解性 (H ₂ O)	ODOR 气味	APPEARANCE 外观
Lead 铅	11.34	327.4°C (化)	None (没有)	None	Sliver-Gray Metal 银灰色金属
Lead Sulfate 硫酸铅	6.2	1070°C (化)	40 mg/l (15°C)	None	White Powder 白色粉末
Lead Dioxide 氧化铅	9.4	290°C (化)	None	None	Brown Powder 褐色粉末
Sulfuric Acid 硫酸	About 1.3	About 114°C (化)	100%	Acidic 酸的	Clear Colorless Liquid 无色液体
Fiberglass Sep. 玻璃纤维隔板	N/A	N/A	SLIGHT 轻微	TOXIC 有毒	WHITE FIBROUS GLASS 白色纤维玻璃
ABS or PP	N/A	N/A	NONE	NO ODOR 没气味	SOLID 固体



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SECTION 3: PROTECTION 第 3 部分: 保护

EXPOSURE 暴露	PROTECTION 保护	COMMENTS 注解
SKIN 皮肤	Rubber gloves, Apron, Safety shoes 橡皮手套, 围裙, 安全鞋	Protective equipment must be worn if battery is cracked or otherwise damaged. 假如电池裂开或有其它的损坏, 一定要带上保护设备
RESPIRATORY 呼吸	Respirator (for lead) 呼吸器	A respirator should be worn during reclaim operations if the TLV exceeded. 在回收时超过 TLV 时, 一定要带呼吸器
EYES 眼睛	Safety goggles, Face Shield 安全眼罩, 脸罩	

SECTION 4: FLAMMABILITY DATA 第 4 部分: 易燃性数据

COMPONENTS 成份	FLASHPOINT 燃烧点	EXPLOSIVE LIMITS 爆炸限定	COMMENTS 注解
Lead 铅	None 没有	None	
Sulfuric Acid 硫酸	None 没有	None	
Hydrogen 氢	259°C	4% - 74.2%	Sealed batteries can emit hydrogen only if over charged (float voltage > 2.4 VPC). The gas enters the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery. 只有在过充时 (float voltage > 2.4 VPC), 密封电池能发出氢气。气体经通风阀向大气排出。要防止爆炸或火, 火花或者其它的火源接近电池 Extinguishing Media: Dry chemical, foam, CO ₂ 灭火器: 干化学泡沫 CO ₂
Fiberglass Sep. 纤维玻璃隔板	N/A (无效)	N/A	Toxic vapors may be released.有毒的气体会放出 In case of fire: wear self-contained breathing apparatus.万一着火, 穿上自带呼吸的设备
478 Polystyrene 478 聚苯乙烯	None 没有	N/A	Temperatures over 300 °C (572°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus. 温度超过 300 °C (572°F)会发出易燃性气体。万一有火, 穿上自带呼吸的设备



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SECTION 5: REACTIVITY DATA 第 5 部分: 反应数据

COMPONENT	成份	Lead/lead compounds 铅/铅化合物
STABILITY	稳定性	Stable 稳定
INCOMPATIBILITY	不相容性	Potassium, carbides, sulfides, peroxides, phosphorus, sulfurs. 钾、碳化物、硫化物、过氧化物、磷、硫磺
DECOMPOSITION PRODUCTS	分解产品	Oxides of lead and sulfur. 铅的氧化物和硫磺
CONDITIONS TO AVOID	应避免的条件	High temperature, Sparks and other sources of ignition. 高温、火花和其它火源
COMPONENT	成份	Sulfuric Acid 硫酸
STABILITY	稳定性	Stable at all temperatures 所有温度时都稳定
POLYMERIZATION	聚合	Will not polymerize 不会聚合
INCOMPATIBILITY	不相容性	Reactive metals, strong bases, most organic compounds 反应金属, 强基础, 大部分有机化合物
DECOMPOSITION PRODUCTS	分解产品	Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen 二氧化硫, 三氧化物, 硫化氢、氢
CONDITIONS TO AVOID	应避免的条件	Prohibit smoking, sparks, etc. from battery charging area. Avoid mixing acid with other chemicals. 在电池充电区域禁止烟, 火花等。不要把酸和其它化学物混合

SECTION 6: CONTROL MEASURES 第 6 部分: 控制方法

1. Store lead/acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.
在足够通风的地方储存铅酸电池。室内通风要求电池应用于备用电能产生源。不要在不通风、闭塞的地方充电
2. Do not remove vent caps. Follow shipping and handling instructions that are applicable to the battery type. To avoid damage to terminals and seals, do not double-stack industrial batteries.
不要移开通风阀。遵循该型号电池的运输和处理说明。以防止损坏端子和密封。不要叠放工业电池

STEPS TO TAKE IN CASE OF LEAKS OR SPILLS 电池漏液时所采取的措施

If sulfuric acid is spilled from a battery, neutralize the acid with sodium bicarbonate (baking soda), sodium carbon (soda ash), or calcium oxide (lime). 假如硫酸从电池中溢出, 用重碳酸钠、苏打水或石灰去中和硫酸

Flush the area with water discard to the sewage systems. Do not allow unneutralized acid into the sewage system. 用水冲洗溢酸表面, 将脏水排至下水道。不要将没有中和的酸冲至下水道。



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WASTE DISPOSAL METHOD: 废物外理方法

Neutralized acid may be flushed down the sewer. Spent batteries must be treated as hazardous waste and disposed of according to local state, and federal regulations. A copy of this material safety data must be supplied to any scrap dealer or secondary smelter with battery. 中和的酸可能会被冲至下水道。失效的电池必须作为有毒废品，根据当地的要求进行处理。提供一份原材料安全性数据给废物处理经销商或电池二级炼外

ELECTRICAL SAFETY 电安全性

Due to the battery's low internal resistance and high power density. High levels of short circuit can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only. 由于电池的底内阻、高能量密度。高水平的短路能发展到电池端子上。不要将工具和线放在电池上。只使用绝缘工具。

Follow all installation instruction and diagrams when installing or maintaining battery systems.

安装或维护电池系统时，参考安装说明书和图

SECTION 7: HEALTH HAZARD DATA 第 7 部分：安全的 HAZARD 数据

LEAD: The toxic effects of lead are accumulative and slow to appear. It affects the kidneys, reproductive, and central nervous system. 铅：铅的毒性不断积累，并慢慢表现出来。它会影响肾形矿脉、再生性和中枢神经系统
The symptoms of lead overexposure are anemia, 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 dusts and fumes. 铅过多的症状有贫血、呕吐、头痛、胃痛，头昏眼花、没胃口和筋骨痛。电池中铅一般会在铅回收的过程中通过呼吸摄入铅灰或铅烟

THIS DATA MUST BE PASSED TO ANY SCRAP OR SMELTER WHEN A BATTERY IS RESOLD.

当电池转卖时，这些数据必须提供给处理商或炼处

SULFURIC ACID: Sulfuric acid is a strong corrosive. Contact with acid can cause severe burns on the skin and in the eyes. Ingestion of sulfuric acid will cause GI tract burns. Acid can be release if the battery case is damaged or if the vents are tamper ed with. 硫酸：硫酸有强腐蚀性，接触硫酸能使皮肤和眼睛产生严重的灼伤。摄入硫酸能使 GI 管道灼伤。假如电池壳损坏或者通风口被堵塞时，酸会漏出

FIBERGLASS SEPARATOR: Fibrous glass is an irritant of the upper respiratory tract, skin and eyes. For exposure up to 10F/CC use MSA Comfort with type H filter. Above 10F/CC up to 50F/CC use Ultra-Twin with type H filter. 纤维玻璃隔板：纤维玻璃对上呼吸道、皮肤、眼睛都有刺激性。辐射量超过 10F/CC，使用带 H 型过滤器的 MSA Comfort，在 10F/CC 至 50F/CC 之间用带 H 型 过滤器的 Ultra-Twin。

NTP or OSHA does not consider this product carcinogenic. NTP 和 OSHA 不会考虑这些产品的致癌性



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SECTION 8: SULFURIC ACID PRECAUTIONS 第 8 部分: 硫酸警告

INHALATION: Acid mist form formation process may cause respiratory irritation, remove from exposure and apply oxygen if breathing is difficult. 吸入: 酸雾的形成使呼吸不畅, 移开敞开物, 假如呼吸困难, 请吸氧

SKIN CONTACT: Acid may cause irritation, burns or ulceration. Flush with plenty of soap and water, remove contaminated clothing, and see physician if contact area is large or if blisters form. 皮肤接触: 酸能造成疼痛、灼伤、溃疡。用肥皂水冲洗, 移开被污染的衣服。假如被硫酸接触的面积很大或者有水泡形成, 请看医生

EYE CONTACT: Acid may cause severe irritation, burns, cornea damage and blindness. Call physician immediately and flush with water until physician arrives. 眼睛接触: 酸能造成疼痛、灼伤、角膜损坏和变瞎。请立即打电话给医生, 在医生到来之前, 用水冲洗眼睛

INGESTION: Acid may cause irritation of mouth, throat, esophagus and stomach. Call physician. If patient is conscious, flush mouth with water, have the patient drink milk or sodium bicarbonate solution. 摄取: 酸能使嘴、咽喉、食道和胃发炎。打电话给医生, 假如患者还有知觉, 用水冲洗嘴, 让患者喝牛奶或重碳酸钠溶液

DO NOT GIVE ANYTHING TO AN UNCONSCIOUS PERSON. 不用给没有知觉的人做什么

SECTION 9: TRANSPORTATION REGULATIONS 第 9 部分: 运输规则

We hereby certify that all RITAR AGM Sealed Lead Acid batteries conform to the UN2800 classification as "Batteries, wet, Non- Spillable, and electric storage" as a result of passing the Vibration and Pressure Differential Test described in DOT [49 CFR 173.159(d) and IATA/ICAO [Special Provision A67]. 我们据此保证所有的 RITAR 的密封型铅酸蓄电池符合 UN2800 分类, 作为“电池, 湿的, 不漏液的, 电储存”, 已通过如 DOT [49 CFR 173.159(d) 和 IATA/ICAO [Special Provision A67] 所描述的振动和压力微分测试

RITAR Batteries having met the related conditions are EXEMPT from hazardous goods regulations for the purpose of transportation by DOT, and IATA/ICAO, and therefore are unrestricted for transportation by any means.

RITAR 的电池满足 DOT 和 IATA/ICAO 中所要求的运输条件, 不是运输的危险品。因此可以通过各种方式运输, 不会被限制。