

MATERIAL SAFETY DATA SHEET – L84

SECTION I: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTITY: "Battery, Electric Storage, Wet, Nonspillable, Not Regulated".
NONSPILLABLE Absorbed Electrolyte Battery – Electrical Storage Valve Regulated
Lead-Acid (VRLA) Battery – Absorbed Glass Mat (AGM)

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Manufacturer Name : Guangdong KSTAR Industrial Science & Technology
Co.,Ltd.

Address : Block No.35, Zhongkai Hi-tech Industrial Development Zone, Huizhou,
Guangdong ,516229,China

Tel : +86-752-3165190

Fax : +86-752-3165191

Web site: www. kstar.com.cn

SECTION II: COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS OSHA COMPONENT	CAS#	OSHA PEL	ACGIH TLV	%BY WEIGHT
* Sulfuric Acid / Battery Electrolyte 1.300 sg 40 wt %	7664-93-9	1mg/m ³	1mg/m ³ STEL	22
*Lead/Grid	7439-92-1	50 ug/m ³	150 ug/m ³	50
*Lead Oxide/Dioxide	1309-60-0	50 ug/m ³	150ug/m ³	21
*Lead Sulfate/ Anglesite	7446-14-2	50ug/m ³	150ug/m ³	<1

Section 313 (40 CFR 372) Listed Toxic Chemicals are Preceded by an*

SECTION III: HAZARDOUS IDENTIFICATION

Appearance and Odor : Acid is a clear to cloudy liquid. Lead is metallic gray in color. Formed lead dioxide is a dark brown in color with a slight acidic odor.

Routes of entry: Sulfuric Acid:

Inhalation, skin, ingestion. Lead:

Inhalation and Ingestion. Ingestion of lead occurs by hand to mouth contamination. After handling lead or its compounds, hands must be washed prior to eating or drinking. Metallic lead cannot be absorbed through the skin.

Health Hazards (Acute & Chronic) Acute :

Sulfuric acid exposure may cause irritation of the skin, corneal damage of the eyes, irritation of the mucous membranes and upper respiratory system, including the lungs. Acute lead exposure may cause GI upset, loss of appetite, diarrhea, constipation, fatigue, joint pain, and difficulty sleeping. Chronic :

Exposure to lead may cause anemia, kidney damage and damage to the central nervous and reproductive systems. Lead exposure may also affect developing fetuses in

HMIS label rating for sulfuric acid: 0 2 X X = acid Hazardous Material Information System	3	pregnant women. Chronic exposure to sulfuric acid may cause scarring of skin and mucous membranes, bronchitis, contact dermatitis, and erosion of tooth enamel.
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SECTION III (Continued)

NFPA label rating for sulfuric acid: 2 0 1 X Fire Protection Agency	X = acid National	Rating Codes: 0= Insignificant, 1= Slight, 2= Moderate, 3= High, 4= Extreme
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HMIS and NFPA Hazard labels are used to identify the battery(s) dilute 1.300sg sulfuric acid. The first number represents the **Health** hazard, second number represents **Fire** hazard, and the third number represents the **Reactivity** hazard. The fourth space identifies the hazardous material, which is acid and/or typical recommended personal protective equipment, i.e., safety glasses, rubber or neoprene gloves etc.

California Proposition 65 Warning – *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.*

SECTION IV: FIRST AID PROCEDURES – Sulfuric Acid

<u>Skin/Eyes</u>	<u>Ingestion/Inhalation</u>
<ul style="list-style-type: none"> - Flush the affected area with water for 15 minutes - Remove contaminated clothing - If irritation continues, seek medical Attention 	<ul style="list-style-type: none"> - Do not induce vomiting - Drink 8 oz. of water or milk - If difficulty in breathing occurs, remove to fresh air, give CPR if necessary - Seek medical attention immediately

SECTION V: FIREFIGHTING MEASURES

FIRE AND EXPLOSIVE PROPERTIES:

Hydrogen Flash point: -259°C **Hydrogen Autoignition point:** 580°C
Hydrogen Flammable Limits in Air (% by Volume): LEL: 4.1 UEL: 74.2 Lower Explosion Limit (LEL), Upper Explosion Limit (UEL)

Unusual Fire and Explosion Hazards: Hydrogen and Oxygen gases are produced in cells during normal battery operation. Ventilate Area.

Extinguishing Media: Dry Chemical, Foam or CO₂

Special Firefighter Procedures: Use Positive Pressure, self-contained breathing apparatus.

SECTION VI: ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF BATTERY IS BROKEN: Neutralize exposed battery parts with soda ash or sodium bicarbonate until fizzing stops, pH should be at neutral 6-8. Provide adequate ventilation. Heat, carbon dioxide and hydrogen gas may be given off during neutralization. Collect residue in a suitable container. Place the broken battery in a heavy-duty plastic bag or other non-metallic container. Properly recycle all battery residue and parts.

SECTION VII: HANDLING AND STORAGE

Store in a cool; dry area away from combustibles. Do not store in sealed, unventilated areas. Avoid overheating and overcharging. Do not use organic solvents or other than manufactures recommended cleaners on the batteries.

SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: General room ventilation is sufficient during normal use and handling. Do not install these batteries in a sealed, unventilated area.

PERSONAL PROTECTIVE EQUIPMENT (DURING INSTALLATION OR IN THE EVENT OF BATTERY BREAKAGE) **Eye Protection** = Chemical goggles, safety glasses with sideshields and or a full-face shield.

Protective gloves = Rubber or neoprene

Respiratory Protection = NIOSH approved acid mist/organic vapor respirator, if OSHA PEL is exceeded.

Other Protective Equipment = Acid resistant apron or clothes.

WORK PRACTICES: Use standard lead-acid battery practices. Do not wear metallic jewelry when working with batteries. Use non-conductive tools only. Discharge static electricity prior to working on a battery. Maintain eyewash, fire extinguisher and emergency communication device in the work area.

SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

ACID : Boiling Point: 110°C to 112°C

Vapor Density: (Air=1) 3.4

Solubility in water: N/A

Specific Gravity 1.300 +/- 0.030

Appearance/Odor: clear to cloudy with slightly acidic odor

Vapor Pressure: 13.8 mm Hg @ 25°C

Melting point: N/A

SECTION X: STABILITY AND REACTIVITY

STABILITY: This battery and contents are stable.

Conditions to avoid: Overheating, overcharging which results in acid mist/Hydrogen generation.

Incompatibility (materials to avoid): Strong alkaline materials, conductive metals, organic solvents, sparks or open flame.

Hazardous Byproducts: Hydrogen gas may be generated in an overcharged condition, in fire or at very high temperatures. In fire, may emit CO, CO₂ and Sulfur Oxides.

Hazardous polymerization will not occur

SECTION XI: TOXICOLOGICAL INFORMATION – SULFURIC ACID

The KSTAR VRLA batteries are a sealed, recombinant design that require no water replacement throughout their service life, thus no contact is made with the battery's internal components or chemical hazards. Under normal use and handling, these batteries do not emit regulated or hazardous substances.

	Administration Route	Dose	Test Animal
LD 50	larO	2140 mg/kg	taR
LDLo	Unreported	135 mg/kg	Man
LC50	Inhalation	510 mg/m3	Rat

Carcinogenicity : The International Agency on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a category 1 carcinogen (inhalation), a substance that is carcinogenic to humans. This classification does not apply to the liquid forms of sulfuric acid contained within the battery. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist at high levels.

SECTION XII: DISPOSAL CONSIDERATIONS

Waste Disposal Method : Send to lead smelter for reclamation following applicable Federal, State and Local regulations. Product can be recycled along with automotive (SLI) lead-acid batteries.

SECTION XIII: TRANSPORTATION AND INTERNATIONAL REGULATIONS

All KSTAR batteries, when transported by air, surface or by vessel are identified as "Battery, Electric Storage, Wet, Nonspillable, Not Regulated".

The battery(s) must be identified as above on the Bill of Lading and properly packaged with their terminals protected from short circuit. NA or UN numbers do not apply.

KSTAR battery(s) warning label identifies each battery as NONSPILLABLE. KSTAR battery(s) preprinted cartons identifies each battery as NONSPILLABLE. KSTAR battery(s) shipped without KSTAR cartons (bulk packed) need to be identified as NONSPILLABLE or NONSPILLABLE BATTERY on the outer packaging.

Air:KSTAR batteries meet the conditions in IATA/ICAO Special Provision A67.

Surface:KSTAR batteries meet the conditions for DOT Haz Mat Regulations

CFR–Title 49 parts 171–189.

Vessel:KSTAR Batteries meet the conditions of IMDG exception 238.

SECTION XIV: REGULATORY INFORMATION

See 29 CFR 1910.268(b)(2)

SECTION XV: OTHER INFORMATION

The information herein is given in good faith, but no warranty, expressed or implied, is made.