

CLASSIFICATION

Batteries, wet, non-spillable, Electric storage.
Substance Identification Number UN2800.

PHYSICAL DATA

COMPONENTS	DENSITY	MELTING POINTS	SOLUBILITY(H ₂ O)	ODOUR	APPEARANCE
Lead	11.34g/cm ³	327.4°C (Boiling)	None	None	Silver-Gray Metal
Lead Sulfate	6.2g/cm ³	1070°C (Boiling)	40 mg/l (15°C)	None	White Powder
Lead Dioxide	9.4g/cm ³	290°C (Boiling)	None	None	Brown Powder
Sulphuric Acid	about 1.3g/cm ³	about 114°C (Boiling)	100%	Acidic	Clear Colorless Liquid
Fiberglass Sep.	N/A	N/A	Slight	Toxic	White Fibrous Glass
475 Polystyrene	N/A	N/A	None	No Odour	Solid

HAZARDS IDENTIFICATION

Sulphuric Acid (up to 40% w/w)	Severe IRRITATION and DAMAGE to internal tissues if swallowed, causes IRRITATION of eyes and skin and may cause BURNS and DERMATITIS R35% Causes severe burns (15% & above) R36/38% Irritating to eyes and skin (5% to 15%) No specific anecdotal treatment, symptomatic support required. No known delayed effects after single exposure apart from consequences of local tissue damage.
Lead inorganic compounds	TOXIC by ingestion or inhalation of dust, vapour or fume. R61 May cause harm to the unborn child R20/22% Harmful by inhalation and if swallowed R33% Danger of cumulative effects
Glass matt separator	Fibres may cause IRRITATION to skin or eyes upon exposure and to internal tissues if inhaled or swallowed.

FIRST AID MEASURES

INHALATION	
Sulphuric Acid:	If mist is inhaled, remove from exposure and to fresh air immediately. If there are any breathing difficulties take to hospital.
Lead:	Remove from exposure, wash out mouth and wash.
Glass Fibres:	If fibres have been inhaled, remove to fresh air. If irritation persists, take to hospital.
INGESTION	
Sulphuric Acid:	Wash mouth out with plenty of water, do not allow swallowing. Then give plenty of water to drink. DO NOT INDUCE VOMITING. Take to hospital immediately. Take to hospital immediately.
Lead Compounds:	
EXPOSURE OF EYES	
Sulphuric Acid:	Wash out immediately with copious amounts of water for at least 15 minutes, holding the eye open if necessary. Take to hospital.
Lead Compounds:	Wash out immediately with copious amounts of water for at least 15 minutes, holding the eye open if necessary. Take to hospital.
EXPOSURE OF SKIN	
Sulphuric Acid:	Wash off skin immediately with copious amounts of water for at least 15 minutes. Remove all contaminated clothing, which must be washed thoroughly before re-use. Remove and dispose of contaminated footwear.
Lead Compounds:	Wash off skin thoroughly with soap and water.

FIRE FIGHTING MEASURES

Batteries on charge may emit hydrogen gas that is highly flammable and will form explosive mixtures in air from 4% to 76%, which may be ignited by a spark at any voltage, especially from the batteries themselves.

Batteries on charge must be isolated from power source before attempting to put out a fire, by switching off the power before disconnecting the batteries from the power source.

Batteries in use will be part of an electrical circuit and so water must never be used to put out a fire.

Damaged batteries may expose negative plates (grey) colour that may ignite if allowed to dry out. These plates may be wetted down with water after the battery has been removed from all electrical circuits.

Use extinguisher types:

CO2, Dry Powder

Hazardous decomposition products:

Carbon monoxide, sulphur dioxide, sulphur trioxide, lead fume and vapour, toxic fumes from decomposition of battery case materials.

Special precautions:

Use self-contained breathing apparatus and full acid resistant protective clothing.

FLAMMABILITY DATA

COMPONENTS	FLASHPOINT	EXPLOSIVE LIMITS	COMMENTS
Lead	None	None	
Sulphuric Acid	None	None	
Hydrogen		4% - 74.2%	Sealed batteries can emit hydrogen only if over charged (float voltage > 2.40 VPC)
Fibreglass Sep.	N/A	N/A	Toxic vapors may be released. In case of fire: wear self-contained breathing apparatus.
478 Polystyrene	None	N/A	Temperatures over 300°C (572°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus.

ACCIDENTAL RELEASE MEASURES

These batteries are designed not to leak under normal conditions. If however electrolyte does leak out of any battery for any reason, it should be absorbed onto dry sand, earth or other inert material and must not be allowed to enter any drains. If possible neutralise any leaked electrolyte using soda ash, sodium bicarbonate, sodium carbonate or calcium powder and then wash thoroughly with water. Collect absorbed material and place in an inert sealed container for disposal, see Disposal Information

HANDLING AND STORAGE

Store batteries in a cool and dry area with an impervious surface. Store under roof and protect against adverse weather conditions. Protect against physical damage and exposure to organic solvents. Do not allow metal objects to contact both terminals at the same time, as this will cause damage, may cause injury and may cause a spark, see Fire Fighting Measures. Large batteries should be handled and moved using mechanical means to prevent risk of injury.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Under normal conditions, where there is no damage and no visible trace of liquid or solid deposit on the batteries, they may be handled without any additional P.P.E. Where there are any signs of damage or liquid or solid deposits, rubber gloves and acid resistant clothing must be worn when handling the batteries and affected packaging to protect against the effects of any acid electrolyte that may be present. If it is suspected that free acid electrolyte is present, then safety glasses must be worn, and if large amounts are present, chemical goggles or face shields should be used.

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PHYSICAL AND CHEMICAL PROPERTIES

The undamaged product is a manufactured item in an inert plastic case, which will burn if subjected to high temperatures. Some battery types are made in a flame retardant plastic, see technical specification.

Batteries on charge may emit hydrogen gas, which is highly flammable and form explosive mixtures in air, see Fire Fighting Measures.

Electrolyte is a clear liquid with little or no smell, which contains sulphuric acid up to 40% in water in a fully charged battery. Leaked electrolyte may dry out to form white patches or patches of other colours, usually green or brown if metals have been attacked, which may be acidic.

In damaged batteries, lead plates can be grey or brown with varying amounts of white. Grey material may ignite if left to dry out.

STABILITY AND REACTIVITY

The undamaged product is stable up to 60°, see Physical and Chemical Properties.

TOXICOLOGICAL INFORMATION

Sulphuric Acid: LD50 2140 mg/kg oral, rat LC50 0.51 mg/1 inh rat
Lead Compounds: No specific data

ECOLOGICAL INFORMATION

Sulphuric Acid: Toxic to fish and algae. Concentrations greater than 1.2 mg/l as 100% sulphuric acid may be lethal to fish. Lowering pH below about 5 would induce fatalities in aquatic life.
Lead Compounds: No specific data.

DISPOSAL INFORMATION

UNDAMAGED & DAMAGED BATTERIES

Store in impervious inert container and send to smelter for recycling. Must be treated as special waste, therefore contact supplier for assistance.

ABSORBED SPILLED ELECTROLYTE

Place in sealed inert container. Treat as special waste. Contact supplier for assistance.

TRANSPORT INFORMATION

VRLA batteries, see Section 1, see Classification are exempt from requirements of:

IATA Dangerous Goods Regulations, 30th Ed., effective from 01.01.96, because they meet ICAO Special Provision A67 as Class 8., Group 111, UN No. 2800 Batteries, wet, non-spillable, electric storage.

International Maritime Dangerous Goods (IMDG) Code Amendment 27-94, which incorporates the ICAO Special Provision A67, for any special conditions. Other relevant general conditions apply.

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

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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 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. THIS DATA MUST BE PASSED TO ANY SCRAP DEALER OR SMELTER WHEN A BATTERY IS RESOLD.
SULPHURIC ACID:	Sulphuric acid is a strong corrosive. Contact with acid can cause severe burns on the skin and in eyes. Ingestion of sulphuric acid will cause GI tract burns. Acid can be released if the battery case is damaged or if the vents are tampered with.
FIBREGLASS SEPARATOR:	Fibrous glass is an irritant of the upper respiratory tract, skin, and eyes. For exposure up to 10F/CC use MSA Comfoll with type H filter. Above 10F/CC up to 50F/CC use Ultra-Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

REGULATORY INFORMATION

Batteries supplied by Shield Batteries are subject to The Batteries and Accumulators (containing Dangerous Substances) Regulations 1994 and are marked in accordance with the requirements of Regulation 4.

OTHER INFORMATION

To ensure safe use of VRLA batteries, the following precautions must be observed:

Never install batteries in a gas-tight enclosure as gasses may be generated during use.

Batteries must always be charged on a voltage-regulated charging system and adequate ventilation provided to avoid the build-up of ignitable gases. Contact your battery supplier for advice.

Never short-circuit battery terminals as sparks and arcs produced can injure personnel and are a fire hazard.

Do not charge batteries above +50°C, or discharge or store above +60°C.

Under extreme conditions of charging equipment malfunction and or battery failure, high voltage and high temperature conditions may occur causing the evolution of Hydrogen Sulphide (H₂S) gas, which is toxic. If detected by its odour of rotten eggs (at extremely low concentrations), switch off the charging equipment, evacuate all personnel from the area and ventilate well. Seek advice before attempting to re-start charging.

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