

MSDS for ABP HIGH DENSITY SEALED LEAD-ACID BATTERY

Part Numbers: ABP-BT-24V/1.9AH-1 and ABP-BT-12V/1.9AH-1

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SECTION 1: PRODUCTS & COMPANY IDENTIFICATION

PRODUCT NAME: VALVE REGULATED SEALED LEAD ACID RECHARGEABLE BATTERY

MANUFACTURER'S NAME: BSB POWER COMPANY LIMITED.

MANUFACTURER'S ADDRESS: MNH2695 RM1007 10/F, HO KING CENTER, NO.2-16FA
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SECTION 2: HAZARDOUS COMPONENTS, PHYSICAL DATA, FLAMMABILITY DATA, FIRST AID, REACTIVITY DATA

HAZARDOUS COMPONENTS

| COMPONENTS | %WEIGHT | TLV | LD50 ORAL | LC50 INHALATION | LC50 CONTACT |
|--|-----------|---------------------|---------------|-----------------|--------------|
| Lead (Pb, PbO ₂ , PbSO ₄) | About 70% | N/A | (500) mg/Kg | N/A | N/A |
| Sulfuric Acid | About 20% | 1 mg/m ³ | (2.140) mg/Kg | N/A | N/A |
| Fiberglass Separator | About 5% | N/A | N/A | N/A | N/A |
| ABS | About 5% | N/A | N/A | N/A | N/A |

PHYSICAL DATA

| COMPONENTS | DENSITY | MELTING POINT | SOLLUBILITY (H ₂ O) | ODOR | APPEARANCE |
|-----------------|-----------|-----------------------|--------------------------------|---------|------------------------|
| Lead | 11.34 | 327.4°C (Boiling) | None | None | Sliver-Gray Metal |
| Lead Sulfate | 6.2 | 1070°C (Boiling) | 40 mg/l (15°C) | None | White Powder |
| Lead Dioxide | 9.4 | 290°C (Boiling) | None | None | Brown Powder |
| Sulfuric Acid | About 1.3 | About 114°C (Boiling) | 100% | Acidic | Clear Colorless Liquid |
| Fiberglass Sep. | N/A | N/A | SLIGHT | TOXIC | WHITE FIBROUS GLASS |
| ABS | N/A | N/A | NONE | NO ODOR | SOLID |

FLAMMABILITY DATA

| COMPONENTS | FLASHPOINT | EXPLOSIVE LIMITS | COMMENTS |
|-----------------|------------|------------------|--|
| Lead | None | None | |
| Sulfuric Acid | None | None | |
| Hydrogen | | 4% - 74.2% | Sealed batteries can emit hydrogen only if over charged(float voltage > 2.4VPC) |
| Fiberglass Sep. | N/A | N/A | Poisonous vapors may be released. Please wear self contained breathing apparatus in case of fire. |
| ABS | None | N/A | Temperatures over 300 °C (572°F) may release combustible gases. Wear positive pressure self contained breathing apparatus. |

FIRST AID

SULFURIC ACID PRECAUTIONS

SKIN CONTACT: Flush with water, see doctor if it doesn't work.

EYE CONTACT: Flush with water and call doctor immediately.

Ingestion: Call the doctor and flush mouth with water, have the patient drink milk if patient is conscious. Do not give anything to the unconscious person.

REACTIVITY DATA

| | |
|------------------------|--|
| COMPONENT | Sulfuric Acid |
| STABILITY | Stable at all temperatures |
| POLYMERIZATION | Will not polymerize |
| INCOMPATIBILITY | Reactive metals, strong bases, most organic compounds |
| DECOMPOSITION PRODUCTS | Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen |
| CONDITIONS TO AVOID | Prohibit smoking, sparks, etc. from battery charging area. Avoid mixing acid with other chemicals. |

SECTION 3: SPILL OR LEAK PROCEDURES, PROTECTION, ELECTRICAL SAFETY, HEALTH HAZARD DATA

SPILL OR LEAK PROCEDURES

ACTION TAKEN FOR THE LEAKAGE OR SPILLS

If sulfuric acid is spilled from a battery, neutralize the acid with sodium bicarbonate (baking soda), sodium carbon (soda ash), or calcium oxide (lime).

Flush the area with water discard to the sewage systems. Do not allow acid into the sewage system before it is neutralized.

WASTE DISPOSAL METHOD:

Neutralized acid may be flushed down the sewer. Used batteries must be treated as hazardous waste and disposed of according to local policy and National Laws. A copy of this material safety data must be supplied to any scrap dealer .

PROTECTION

| EXPOSURE | PROTECTION | COMMENTS |
|-------------|-----------------------------|---|
| SKIN | Rubber gloves, Apron | Protective equipment must be worn if battery is cracked or otherwise damaged. |
| RESPIRATORY | Respirator (for lead) | A respirator should be worn during reclaim operations if the TLV exceeded. |
| EYES | Safety goggles, Face Shield | |

ELECTRICAL SAFETY

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 put tools or cables on the battery. Use insulated tools only. Strictly follow all the instruction for installation and diagrams when installing or maintaining battery systems..

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.

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 tampered with.

FIBERGLASS SEPARATOR: Fibrous glass is an irritant of the upper respiratory tract, skin and eyes. Please use the relative protection gears if necessary.

SECTION4: Transportation information

Acceptable modes of transportation: air, rail, road and water.

Batteries must be protected so as to prevent short circuit and must be securely packed and marked on the container "Non-Spillable"

SECTION5: Vibration test, Pressure differential test, Temperature test

Test Results:

The following tests were processed in sequence with the same three samples.

1.Vibration test

The three batteries were rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm(1.6 mm maximum total excursion) was applied. The frequency was varied at the rate of 1 Hz/min between the limits of 10 Hz and 55Hz. The entire range of frequencies and return was traversed in 95 ± 5 minutes fro each mounting position(direction of vibration) of the batteries. Each battery was tested in three mutually perpendicular positions (to include testing with fill openings and vent in an inverted position) for equal time periods.

The batteries did not leak after the test.

2.Pressure differential test

Following the vibration test, the three batteries were stored for six hours at $24 \text{ }^{\circ}\text{C}$ - $4 \text{ }^{\circ}\text{C}$ while subjected to a pressure differential of 88kPa. Each battery was tested in three mutually perpendicular positions (to include testing with fill openings and vent in an inverted position) for progress above in each position. After the test, the samples did not leak in 20 minutes.

3.Temperature test

Quantity of sample: 3 pieces

A 5 mm width slot paralleled to the bottom edge was made on the three analytical geometry of three dimensions side of every battery (to include one side against fill openings and vent). The position of each slot was mutually perpendicular, and the slots are made 1/3 position from bottom edge. The samples were put into the oven, with the gradual raise of temperature up to $55 \text{ }^{\circ}\text{C}$, then kept the temperature for 2 hours. Each battery was tested in three mutually perpendicular positions(to include testing with fill openings and vent in an inverted position) for equal time periods.

The batteries did not leak after the test.