# Material Safety Data Sheet (MSDS): Batteries – All References, All Part Numbers

## 1. Identification of the substance / Preparation and Company/Undertaking

**Substance or preparation trade name:** Lead Acid

**Storage Batteries filled with dilute Sulphuric acid.**

**Technical Name:** Lead Acid Accumulator.

**Unique reference number(s):** All references

**Company/undertaking name, address and normal phone number:**
Platinum International Ltd,
Platinum House,
Bailey Road,
Trafford Park,
Manchester.
M17 1SA

**Tel:** 0845 063 9999

## 2. Composition/Information on Ingredients

**Substance? Y/N:** NO

**Preparation Name:** All Part Numbers

**Composition/Information on ingredients:** Components in a Lead Acid Battery
Lead
Lead Dioxide
Lead Sulphate
Sulphuric Acid (of maximum strength 40%) – **Main Hazard**
**Type of container**: Polypropylene

## 3. Hazard Identification

**All Part Numbers**

**Electrolyte (Battery Acid) – Main Hazard**
Corrosive
Hazard Statements - Causes severe burns and eye damage (H314)
Precautionary statement – Keep out of reach of children (P102)
IF IN EYES (P305)
Rinse cautiously with water for several minutes (P351)
Remove contact lenses, if present and easy to do so. Continue rinsing (P338)
Get immediate medical advice/attention (P315)

**Electrical Energy:**
The accidental connection of battery terminals to conductive objects, such as metal tools or jewellery etc., may generate sufficient heat to cause burns, create arcing or cause molten metal to splash.

**Lead and Lead Compounds:**
Lead and lead compounds are toxic if ingested or inhaled.
The lead and its components are well contained within the battery and the possibility of lead exposure is negligible. However, the battery cells should not be dismounted under any circumstances.

Precautionary Statements – Warning! Contains Lead (EUH 201A)

**Emission of gases:**
A mixture of oxygen and hydrogen is emitted during battery charging and may also be emitted at times, for example, if a battery is moved or shaken. These gases contain droplets of corrosive electrolyte. A hydrogen/air mixture can produce a violent explosion if ignited and it MUST be assumed that this mixture is present in the immediate vicinity at the top of the battery, at all times.

**NO SMOKING, NO NAKED FLAMES, NO SPARKS**
**An explosive atmosphere exists if the concentration of hydrogen exceeds 4%**

## 4. First Aid Measures

**Electrolyte (Battery Acid) Emergency Action**
**Eye Contact:** Immediately flood with copious quantities of water, holding the eye open if necessary. **Get immediate medical advice/attention.**

**Skin Contact:** Immediately wash the affected area with copious amounts of clean water, preferably under a shower. Remove any contaminated clothing while washing proceeds. Obtain medical attention is blistering occurs or if irritation persists.

**Ingestion:** Wash out mouth with water, give plenty of water and other fluids to drink. Do not induce vomiting. **Get immediate medical advice/attention.**

**Inhalation:** Remove from exposure. Keep warm and rest. If there is respiratory distress, give oxygen. **Get immediate medical advice/attention.**

**Note to Doctors:** Harmful by ingestion, inhalation, skin and eye contact.
Local corrosive effects predominate.
No known systematic effects.
No specific antidotal treatment, symptomatic support required.
No known delayed effects after single exposure apart from consequence of local tissue damage.

**Electrical Energy Emergency Action:**
Burns – **Get immediate medical advice/attention.**
Electric Shock: If mains equipment in use, follow the correct emergency procedure for electric shock victims. **Get immediate medical advice/attention.**

**Emission of Gases Emergency Action:**
Explosion: Seek medical advice, remembering that acid may have been sprayed.

## 5. Fire Fighting Measures

The internal ohmic resistance of a lead acid battery is very low and a high current will flow if the terminals are short circuited. Sparks and molten metal may be ejected. It is therefore essential to avoid metal objects touching across the terminals.

The boxes and lid are made from several types of plastic component, which under normal conditions present no hazard. However, in the case of fire the plastic could decompose and may give off toxic vapours.

Toxic fumes may also evolve during a fire from the lead components. Suitable respiratory protection should therefore be worn during firefighting.

**Extinguishing Media:** Carbon Dioxide or smother with dry powder.

## 6. Accidental Release Measures

### Spillage of Electrolyte (Battery Acid)

**Personal Precautions**
Wear full protective clothing, i.e. see exposure Controls/Personal Protection (Section 8).

**Environmental Precautions**
All spillage's must be contained - Do not allow to enter storm-water drainage. If spillage or contaminated washings causes contamination of water courses, drains or vegetation inform the relevant authorities.

**Methods for cleaning up**
Small spillage's - flood with copious amounts of water. (CAUTION - see Stability and Reactivity - section 10).

Large spillage's - Contain using earth, sand or vermiculite, pump into an emergency tank. Spread soda ash or crushed limestone over area, sweep into containers.
Repeat.
Wash down area with water. Dispose of containers and if necessary Sulphuric acid using licensed waste disposal contractors. Collect and treat water used in clean up – See Environmental Precautions above.

## 7. Handling and Storage

The handling and proper use of lead-acid batteries is not hazardous, provided that sensible precautions are observed and that operatives, having been trained in their use, are adequately supervised.

Always store upright.

Batteries are generally heavy and awkward to handle. Care should be taken and correct lifting techniques employed.

Use only distilled water for topping up cells; other substances may cause a dangerous reaction in the cells. Top up to the recommended level - do not overfill.

Ensure batteries are maintained in dry, clean conditions, to avoid the possibility of corrosion and short circuits developing. The ideal ambient temperature would be between 0°C and 10°C.

No attempt should be made to repair a battery. This work involves a number of hazards and should be carried out only by suitably trained persons in accordance with manufacturer's instructions.

Recharging should be done in a well-ventilated area, which should include either good natural ventilation and/or exterior fans to extract gases.

## 8. Exposure Controls/Personal Protection Electrolyte (Battery Acid)

Always wear protective clothing when handling batteries, rubber or PVC apron, rubber or PVC gloves, acid resistant boots and eye protection (chemical goggles and/or Full-face visor). This is particularly important during fitting and charging operations.

**Occupational Exposure limits (O.E.L)**
Sulphuric acid TWA: 1mg/$m^3$ EH40/98

**Occupational Exposure Controls:** Control airborne concentration below the exposure guidelines. Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

**Environmental Exposure Controls:** Products to be stored in a building with a sealed drainage system, an impermeable surface and waterproof covering.

## 9. Physical and Chemical Properties

**Electrolyte (Battery Acid)**
**Appearance:** Colourless liquid
**Flash Point:** Not applicable
**Odour:** Acrid odour or odourless
**Flammability:** Not applicable
**pH:** Not applicable
**Auto Flammability:** Not applicable
**Solubility:** Miscible in all proportions
**Boiling point:** 25%: 106$^{O}$C 35%: 111$^{O}$C
**Melting point:** 25%: -22$^{O}$C 35%: -57$^{O}$C
**Vapour Pressure:** 25%: 18.83 mbar 35%: 15.73 mbar

| Density 20°C | %H2S04 W/W | Viscosity 20°C | Vapour Pressure mm, Hg 25°C | Freezing Point °C |
|---|---|---|---|---|
| 1.180 | 25 | | | -20 |
| 1.205 | 28 | 2.01 | 8.7 | -27 |
| 1.230 | 31 | | | -38 |
| 1.240 | 33 | | | -47 |
| 1.250 | 34 | | | -52 |
| 1.260 | 35 | | | -58 |
| 1.270 | 36 | | | -60 |
| 1.280 | 37 | | | -61 |
| 1.300 | 40 | 2.70 | 13.8 | -64 |

## 10. Stability and Reactivity

**Stability:** Sulphuric acid if stored correctly will not decompose over time.
**Conditions to avoid:** Smoking should be prohibited when handling Sulphuric acid.
**Materials to avoid:**
**Water:** Much heat is evolved and a violent reaction occurs when a small amount of water is added to a large amount of acid. Always dilute by adding acid to water.
**Acids:** Dangerous reactions with nitric acids, hydrochloric acid, formic acid and dilute acids in general with the possible evolution of toxic gas.
**Bases/Alkalis:** Violent reactions.
**Oxidising Agents:** Violent reactions with chlorine oxyacid salts, hydrogen peroxide and permanganates. .
**Other Chemicals:** Dangerous reactions possible with aldehydes, keytones, halocarbons, Nitrocompounds, cyanides, phosphorous (III) oxide and fluorides.
**Hazardous**: Sulphuric acid at lower strengths reacts with many metals, giving off highly flammable hydrogen gas.
**Decomposition Products**

## 11. Toxicological Information

**Electrolyte (Battery Acid)**
Effect of Substance:
**On Eyes:** Liquid - Severe burns and tissue destruction.
Mist or fume - Irritation, may cause burns at higher concentrations.
**On Skin:** Liquid - Severe burns and tissue destruction.
Mist or fume - Irritation.
**By Skin Absorption:** No known systemic effects.
**By Ingestion**: Severe corrosion of the mouth, throat and digestive tract.

**When Inhaled:** Exposure to the mist or fumes at concentrations much above the OEL (Acute Effect) causes moderate to severe irritation of the nose, throat and upper respiratory tract. High concentrations may cause immediate respiratory difficulty and serious damage to lung tissue. Prolonged or repeated exposure to mists may cause dental erosion (Chronic effect) erosion, chronic inflammation of the upper respiratory tract, bronchitis or lung damage.

The WHO International Agency for Research on Cancer (IARC) have concluded that occupational exposure to inorganic mists containing sulphuric acid is carcinogenic to man. Although no direct link has been established between sulphuric acid and the frequency of cancer in man it is advisable to

minimise exposure to any mist or aerosol during the use of sulphuric acid and if it cannot be avoided it should be kept below the OEL.

## 12. Ecological Information

**Electrolyte (Battery Acid)**
Toxic to fish and algae. Concentrations greater than 102 mg/1 as 100% acid may be lethal to fish. Lower pH below about 5 would induce fatalities in aquatic life.
Mobility: Soluble in aqueous systems. May layer out across the bottom surface of a body of water. This effect may be more pronounced where there is little potential for natural turbulence.

## 13. Disposal Considerations

Batteries, battery acid and lead compounds must be disposed of in accordance with the Regulations set out in section 15.

Used or scrap batteries are classified as Special Waste.

Lead acid batteries are also subject to EEC Council Directive 91/157/EEC on batteries and Accumulators containing dangerous substances which requires users to be advised of the need to return for recycling.

Batteries awaiting disposal must be stored in a leak proof container in a safe and secure manner.

Those transporting scrap batteries must be registered with a waste Regulation Authority. It is an offence to transfer to a carrier who is not registered.

Scrap batteries are subject to a Special Waste Consignment Note Procedures.

For further advice regarding the disposal of scrap batteries, consult the Environmental Agency and/or the Environmental Department of the Local Authority.

## 14. Transportation Information

UN Number: 2794
Classified Code: 8, corrosive substance Packing Group: III
Emergency Action Code: (EAC): 2R
IATA Classification: Not classified for transport by air.

## 15. Regulatory Information

**Acid filled batteries are subject to:**
The Carriage of Dangerous Goods by Road Regulations 1996
Special Waste Regulations 1996
Environmental Protection Act 1990 (Section 34 Duty of Care)
The Batteries and Accumulators (Containing Dangerous Substances) Regulations 1994.
Control of Substances Hazardous to Health Regulations 1998

## 16. Other Information

The data contained in this Safety Data Sheet is provided as required by the Consumer Protection Act 1987 and the Health and Safety at Work Act 1974. Please ensure this information is communicated to all staff within your organisation who are concerned with it. The batteries supplied by us have been subject, so far as is reasonably practicable, to test, examinations and necessary research as required by Section 6 of the Health and Safety at Work Act 1974 and we are satisfied that they are safe and without risk to health and safety when used properly However, it is imperative that all persons who test, charge, fit or handle lead-acid batteries are aware of the dangers which can exist if the tasks are carried out incorrectly. The stored electrical energy is significant, the units are heavy and the constituent parts are both corrosive and toxic.

It is vitally important that the Manufacturer's instructions are read carefully and complied with. If there is any doubt about any of the aspects relating to the proper use of our products, we will be only too pleased to advise on any precautions that may be necessary.

**References:**

Code of Practice for safe operation of starter batteries BS.6604: 1985 (1993)
Hays Chemical Distribution Ltd SDS/108/93 Sulphuric Acid 15 - 70%
EH40/98, Occupational Exposure Limits, HSE.