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Material Safety Data Sheet
“Battery, wet, filled with acid”

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N° Page's 5 (including this page)

I. PRODUCT IDENTIFICATION

| | |
|--|---|
| Chemical/Trade Name (Identity used on label) | Lead acid battery |
| Chemical Family/Classification | Electric Storage Battery - Battery, wet, filled with acid |
| Company name | Nederlandse Accumulatoren Productie BV |
| Adress | Montageweg 1 NL-6045 JA ROERMOND – The Netherlands |
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| Date issued | February 21st 2007 |
| Transportation Emergencies | +31 475 32 41 47 |

II. HAZARDOUS INGREDIENTS

| Materials | % Volumetric Weight | CAS number | MAC value | R-sentences |
|--|---------------------|-----------------------|---------------------------|-------------|
| Lead (Pb) | 15 – 30 | 7439-22-1 | 15 mg/m ³ | --- |
| Lead dioxide (PbO ₂) | 25 – 50 | 1309-60-0 (powder) | 15 mg/m ³ | 61-20/22-33 |
| Electrolyte (H ₂ SO ₄ 37%) | 15 – 35 | 7664-93-9 (>60%) | 1 mg/m ³ (96%) | 35 |
| Box / Lid (Polypropylene) | 3 – 8 | N/A | N/A | --- |

III. HAZARDS

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|--------|---|
| Danger | Sulphuric Acid – reacts violently with strong alkalines, reducing agents and water to produce heat. |
| | Lead compounds – the substance decomposes when extremely heated to lead vapour and oxygen. The compound reacts vigorously with reducing agents and produces chlorine when exposed to hydrochloric acid. |
| | Battery – a charged battery delivers a high current when short circuited which can cause a fire |
| | Battery – on prolonged (over)charge an explosive gas mixture is |

formed (O₂+H₂).

IV. FIRST AID MEASURES

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| Inhalation | Sulphuric acid – Take person into fresh air. Keep the victim calm in a half-sitting way. If necessary, give oxygen and take the person to the hospital as soon as possible. |
| | Lead compounds – Take person into fresh air. Keep the victim calm in a half-sitting way. Rinse nose and mouth and consult a physician. (N/A for wet filled batteries). |
| Skin contact | Sulphuric acid – Take off contaminated clothing and rinse the person with plenty of water at room temperature. In case of burning injuries, immediately consult a physician. |
| | Lead compounds – N/A |
| Eye contact | Sulphuric Acid – hold eyelids open and rinse for a long period with cool water, and, if possible, first take out contact lenses. Don't use neutralizing agents, and immediately consult a physician. |
| | Lead compounds – hold eyelids open and rinse for a long period with cool water, and, if possible, first take out contact lenses. Don't use neutralizing agents, and immediately consult a physician. |
| Ingestion | Sulphuric Acid – Immediately rinse mouth and let the person drink water as precautionary measurement. Do not induce vomiting and take the person to hospital as soon as possible. |
| | Lead compounds – Immediately rinse mouth and take the person to the hospital as soon as possible. |

V. FIRE AND EXPLOSION HAZARD DATA

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| Flashpoint | N/A |
| Explosion limits | LEL = 4.1% (Hydrogen Gas) UEL = 74.2% |
| Extinguishing Media | CO ₂ , foam and powder. Both sulphuric acid and lead compounds are not combustible but side reactions can cause the formation of hydrogen (H ₂). |
| Special fire fighting procedures | When batteries are on charge, switch off the rectifiers. Use pressure-demand, self containing breathing apparatus where acid vapour or mist may be present. Fires with batteries in series form an extra risk because of high voltage. Allowable extinguishing media in this case are CO ₂ or dry chemical. Not water because of electrocution hazard or explosion (H ₂). Wear protective clothing. |
| Note on fire and explosion hazard | During charging of lead acid batteries oxygen (O ₂) and hydrogen (H ₂) are formed. Under overcharge conditions this gas mixture is vented in the atmosphere. To minimise the risk for fire or explosion, closely follow the instructions given by the manufacturer and keep open fire or sources of ignition away. Prevent the formation of short circuits by metal objects. Follow the instructions given by the manufacturer for installation and use. |

VI. PROTECTIVE MEASURES TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

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|------------------------|---|
| Personal Measures | Use protective clothing (synthetic materials), and wear safety goggles (or a face-shield). |
| Environmental Measures | Contain spill by diking it with soda ash (sodium carbonate) or lime (calcium oxide). Cover spill with either chemical. DO NOT FLUSH (LEAD CONTAMINATED) ACID INTO A SEWER! |
| Waste Disposal Method | Ventilate area. Remove all combustible materials and all sorts of ignition. Contain spill by diking it with soda ash (sodium carbonate) or lime (calcium oxide). Cover spill with either chemical. Mix well. Make certain mixture is neutral (check with pH paper). Collect residue and place in a drum or other suitable container. Dispose of as hazardous waste. When a filled battery is leaking, immediately place it in a suitable container. |

VII. HANDLING AND STORING PRECAUTIONS

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| Technical Measures | Handling and storage only on well ventilated places. Prevent spilling of battery acid into the sewer in case of damage. Running water has to be present in case of an emergency. |
| Procedure | Check if vent plugs are fastened properly to prevent spilling of electrolyte on skin or in eyes. Do not palletise batteries higher than the number of layers given by the manufacturer. Two layers have to be separated by a sheet of hardboard and/or styrofoam. Be careful with metal objects to prevent short circuits. Prevent dropping or damaging the batteries. |

VIII. SAFE HANDLING PRECAUTIONS

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| Personal Hygiene | Wash hands thoroughly before eating or drinking, or putting on make-up. |
| Preventive measures at non-routine tasks, including normal maintenance | Minimise the formation of explosive gasses by preventing excessive overcharge. Do not allow presence of sources of ignition in the charging room when the rectifiers are switched on or within two hours after switching off. Place "smoking prohibited" signs. |
| Personal Protection Means | |
| Respiratory Protection | Breathing apparatus is not required under normal circumstances. In case of acid mist, that exceeds the MAC-VALUE of H ₂ SO ₄ 96% : 1 mg/m ³ , or causes irritations or in case of insufficient ventilation, then use breathing apparatus. |
| Eyes and facial protection | Safety goggles or face shield. |
| Hands, arms and body protection | Wear a long sleeved shirt and trousers made of synthetic materials. Also use an impermeable, acid resistant apron and gauntlet type gloves. |
| Other Special Clothing and Equipment | Use safety shoes with rubber or neoprene boots or steel-toed rubber or neoprene boots worn over socks. Place pants legs over boots to keep acid out of boots. When necessary use acid resistant clothing and shoes. |

IX. PHYSICAL DATA

| | Electrolyte | Lead | Lead dioxide |
|-------------------------------|--|-----------|--------------|
| Material is | Liquid | Solid | Solid |
| Colour | Colourless | Dark Grey | Dark brown |
| Odour | Slightly Acidic | | |
| Boiling Range | 110 – 140°C | 1740°C | N/A |
| PH | <1 | | |
| Viscosity | 2,3 mPa.s | | |
| Melting Point | -72°C | 327°C | N/A |
| Decompositioning temperature | 310°C | | 290°C |
| Vapour Pressure | 0,05 Pa (20°C) | | |
| Vapour Density | 3,4 (air = 1) | | |
| Specific Gravity | 1,280 kg/l (20°C) (H ₂ O = 1) | 11,3 kg/l | 9,4 kg/l |
| Flash point | N/A | | |
| Explosion limits | N/A | | |
| Solubility (H ₂ O) | 100 % | Insoluble | Insoluble |

| X. REACTIVITY AND STABILITY | |
|--------------------------------------|--|
| Stability | Stable under normal circumstances. |
| Conditions to avoid | Smoking, fires, and any other source of ignition around lead acid batteries. Prolonged overcharge. Use in ambient conditions > 50°C without adaptations. Presence of reactive metals which form hydrogen in contact with sulphuric acid. |
| Incompatibility (materials to avoid) | Combustible materials (especially finely divided), strong reducing agents, most metals, carbides, organic materials, chlorates, nitrate picrates, and fulminates. |
| Hazardous Decomposition Products | Sulfuric acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen. Lead compounds: High temperatures likely to produce toxic metal fume, vapor or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas. |
| Hazardous Polymerisation | N/A |

| XI. TOXICOLOGICAL INFORMATION | |
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| Routes and methods of entry | |
| Inhalation | Battery electrolyte acid mist generated during battery formation may cause breathing problems or respiratory irritation due to corrosive effect. Lead compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs. |
| Skin Contact | Battery electrolyte (acid) may cause irritative contact dermatitis and skin burns due to corrosive effect. Lead compounds: Not absorbed through the skin. |
| Skin Absorption | Skin absorption is not a significant route of entry. |
| Eye Contact | Battery electrolyte (acid) will irritate the eyes upon contact. Can cause blindness due to corrosive effect. Lead compounds: May cause eye irritation. |
| Ingestion | Ingestion of battery acid may cause irritation to mouth, throat and stomach. Lead compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to systemic toxicity and must be treated by a physician. |
| Signs and symptoms of overexposure | |
| Acute Effects | Sulphuric acid: Severe skin irritation, damage to cornea, upper respiratory irritation. Lead compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability. |
| Chronic Effects | Sulfuric acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes. Lead compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. |

| XII. ENVIRONMENTAL INFORMATION | |
|---------------------------------------|---|
| Environmental Protection | Do not dispose of in sewer, ground water or open water course. May not be disposed of in a diluted or neutralised substance in an open water course or sewer. Danger for contaminating drinking water, even in very low amounts when disposed of. |

| XIII. WASTE DISPOSAL METHODS: | |
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| Storage | Place spent batteries in a sealed container. Always place the batteries upright to prevent spillage and short circuiting. Don't stack the batteries too high and use the container solely for spent batteries and not for other waste. |
| Removal | Spent batteries: Send to secondary lead smelter for recycling. Place neutralized slurry into sealed containers and handle as applicable with state and federal regulations. Large water-diluted spills, after neutralization and testing, should be managed in accordance with approved local, state and federal requirements. |

XIV. INFORMATION FOR TRANSPORTATION

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| Road Transport (ADR/RID) (International) ADR/GGVS/E Class Number Kemler number UN - number | 8 Corrosives C11 80 2794 |
| Label | 8 |
| Description | 2794 Batteries, wet, filled with acid |
| Naval Transport (IMDG): IMDG class Page UN – number Packaging group EMS – number MFAG Marine pollutant Description | 8 8147 2794 II 8-15 760 No Batteries, wet, filled with acid |
| Air Transport (ICAO – TI and IATA – DGR): ICAO/IATA class UN/ID – number Packaging group Description | 8 2794 II Batteries, wet, filled with acid |

XV. LEGALLY REQUIRED INFORMATION

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|--|---|
| Classification according EEC-guidelines | |
| Electrolyte Lead (powder) Lead compounds | EC-nr: 016-020-00-8 EC-nr: 231-100-4 --- |
| Symbol(s) | C – Corrosive |
| R – Sentence | R35 – causes severe burns. |
| S – Sentences | S2 – keep away from children. S26 – In case of eye contact immediately rinse with plenty of water and consult physician. S 30 – Never dilute by adding water to the acid. |

XV. ADDITIONAL INFORMATION

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| Legislation | This MSDS is according to guideline EEC 91/155/EEG. |
| Disclaimer | The information to compose this document has been gathered with great care from existing data. Nederlandse Accumulatoren Productie B.V. will not accept any damage or injury, whatever kind or size, which may result of using this document. |
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