

<b>MATERIAL SAFETY DATA SHEET</b>	<b>No: MSDS 05 TRACTION</b> Date Issued : 15-02-2008 Pages : 1 of 9
<b>COMPANY DETAILS</b>	
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## MATERIAL SAFETY DATA SHEET

### TRACTION

#### 1. PRODUCTION IDENTIFICATION

TRADE NAME : Battery, wet, contains acid  
: Traction  
PRODUCT FAMILY : Electric Storage Battery  
UN NO. : 2794

#### 2. COMPOSITION

<u>CHEMICAL</u>	<u>TRADE NAME</u>	<u>HAZARDOUS</u>	<u>CAS NO.</u>	<u>% WT</u>	<u>AIR EXP OSHA</u>	<u>LIMITS ACGIH</u>	<u>MG/M<sup>3</sup> NIOSH</u>
<b>Inorganic compounds of the negative grid:</b>							
Pb	Lead	Yes	7439-92-1	95%	0.05	0.15	0.1
Sb	Antimony	No	7440-36-0	5%	0.5	0.5	-
<b>Inorganic compounds of the positive grid:</b>							
Pb	Lead	Yes	7439-92-1	95%	0.05	0.15	0.1
Sb	Antimony	Yes	7440-36-0	3.2%	0.5	0.5	-
<b><u>Electrolyte:</u></b>							
H <sub>2</sub> SO <sub>4</sub>	Sulphuric Acid	Yes	7664-93-9	*29%	1	1	1
<b><u>Case Material:</u></b>							
PP	Polypropylene	No	9003-07-0	100%	None listed		
<b><u>Lid Material:</u></b>							
PP	Polypropylene	No	9003-07-0	100%	None listed		

### 3. HAZARD IDENTIFICATION

**MAIN HAZARD** : Explosion / Corrosion  
**EXPLOSION HAZARDS** : Hydrogen gas is liberated during the operation of batteries. Keep other sources of ignition away from batteries. Do not allow metallic contact between terminals of opposite polarity. Follow manufacturer's instruction on installation and service.

**ROUTES OF ENTRY** : **Sulphuric Acid:** Harmful by all routes of entry  
**Lead compounds:** Hazardous exposure can only occur only when product is heated, oxidised or otherwise processed or damaged to create dust, vapour or fume.

#### HEALTH EFFECTS

**EYES** : **Sulphuric Acid:** severe irritation, burns, Cornea damage and blindness.  
**Lead Compounds:** May cause eye irritation.

**SKIN** : **Sulphuric Acid:** Severe irritation, burns and ulceration.  
**Lead compounds:** Not absorbed through the skin.

**INGESTION** : **Sulphuric Acid:** May cause severe irritation of mouth, throat, oesophagus and stomach.  
**Lead Compounds:** Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhoea and severe cramping. This may lead to rapidly systematic toxicity and must be treated by a physician.

**INHALATION** : **Sulphuric Acid:** Breathing of Sulphuric acid vapours or mists may cause severe respiratory irritation.  
**Lead Compounds:** Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

**CARCINOGENICITY** : **Sulphuric Acid:** The International Agency of Research on Cancer (IARC) has classified "strong inorganic acid mist containing Sulphuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of Sulphuric acid solution contained within a battery. Inorganic acid mist (Sulphuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of Sulphuric acid mist.  
**Lead Compounds:** Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof carcinogenicity in humans is lacking at present.

**EFFECTS OF OVEREXPOSURE – ACUTE**

**Sulphuric Acid:** Severe skin irritation, damage to cornea upper respiratory function.

**Lead Compounds:** Symptoms of toxicity include headaches, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

**EFFECTS OF OVEREXPOSURE – CHRONIC**

**Sulphuric Acid:** Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.

**Lead Compounds:** Anaemia neuropathy, particularly of the motor nerves, with wrist drop, kidney damage, reproductive changes in males and females.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**

Overexposure to Sulphuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of Sulphuric acid with skin may aggravate skin diseases such as eczema and contact dermatitis. Lead and its compound and aggravate some forms of kidney, liver and neurological diseases.

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**4. FIRST AID MEASURES**

<b>PRODUCT IN EYES</b>	:	<b>Sulphuric Acid and Lead:</b> Flush immediately with large amounts of water for at least 15 minutes, consult a physician.
<b>PRODUCT ON SKIN</b>	:	<b>Sulphuric Acid:</b> Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely including shoes. <b>Lead:</b> Wash immediately with soap and water.
<b>PRODUCT INGESTED</b>	:	<b>Sulphuric Acid:</b> Give large quantities of water; do not induce vomiting, consult a physician. <b>Lead:</b> Consult a physician immediately.
<b>PRODUCT INHALED</b>	:	<b>Sulphuric Acid:</b> Remove to fresh air. If breathing is difficult give oxygen. <b>Lead:</b> Remove from exposure, gargle, wash nose and lips, consult physician.

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**5. FIRE FIGHTING MEASURES**

<b>EXTINGUISHING MEDIA</b>	:	CO <sub>2</sub> , foam or dry chemical. Flammable limits: LEL = 4.1% (hydrogen gas) UEL = 74.2%.
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**SPECIAL HAZARDS** : If batteries are in charge, shut off power. Use positive pressure, self contained breathing water apparatus. Water applied to electrolyte generates heat and causes it to splatter. High flammable hydrogen gas is generated during charging and operation of batteries. To avoid risk fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic materials to simultaneously contact negative and positive terminals of cells and batteries. Follow manufacturer's instruction for installation and service.

<b>PROTECTIVE CLOTHING</b>	:	<b><u>APPARATUS</u></b>	<b><u>EXTINGUISHING</u></b>	<b>ACTION</b>
		Self contained Breathing apparatus	<b><u>MEDIA</u></b> CO <sub>2</sub> foam, dry chemical	

Check if batteries are on charge. Switch off Power (in case batteries are on charge).

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## 6. **ACCIDENTAL RELEASE MEASURES**

**PERSONAL PRECAUTIONS** : Wear acid resistant clothing, boots, face-shield, gloves. Do not allow discharge of un-neutralised acid to sewer.

**ENVIRONMENTAL PRECAUTIONS** : **Spent batteries:** Send to supplier (secondary lead smelter) for recycling. Place neutralised slurry into sealed containers and handle as applicable with state and federal regulations. Large water-diluted spills, after neutralisation and testing should be managed in accordance with approved local, state and federal requirements.  
**Large and small spills:** Stop flow of material contain/absorb small spills with dry sand, earth and vermiculite. Do not use combustible materials. If possible, carefully neutralise electrolyte with soda, ash, sodium bicarbonate, lime etc.

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## 7. **HANDLING AND STORAGE**

**SUITABLE MATERIAL HANDLING/ STORAGE PRECAUTIONS** : Store batteries in cool, dry well-ventilated areas with impervious surfaces and adequate containment in the event of spills. Batteries should also be stored under roof for protection against adverse weather conditions. Separate from incompatible materials. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat.

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

<b>ENGINEERING CONTROL</b>	:	Store and handle in well-ventilated areas. If mechanical ventilation is used, components must be acid resistant.
<b>RESPIRTORY PROTECTION</b>	:	None required under normal handling and conditions. When concentrations of sulphuric acid mist are to known to exceed PEL, use NIOSH or MSHA – approved respiratory protection.
<b>PERSONAL PROTECTION – HAND</b>	:	Rubber or plastic acid-resistance gloves with elbow-length gauntlet.
<b>PERSONAL PROTECTION – EYE</b>	:	Chemical goggles or face shield.
<b>PERSONAL PROTECTION - SKIN</b>	:	Acid resistant apron. Under severe exposure or emergency conditions, wear acid-resistant clothing] and boots.
<b>OTHER PROTECTION</b>	:	In areas where sulphuric acid is handled in concentrations greater than 1%, emergency eyewash stations should be provided, with unlimited water supply. Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid Contact with internal components. Wear protective clothing when filling or handling batteries.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<u>COMPONENT</u>	<u>BP</u>	<u>SOLUBILITY IN H<sub>2</sub>O</u>	<u>APPEARANCE &amp; ODOUR</u>	<u>SG</u>	<u>VAPOUR PRESSURE MmHg</u>	<u>FLAMMABLE LIMITS</u>
H <sub>2</sub>	-253°C		None			LEL=4.1% UEL=76%
Sulphuric Acid	95-96°C	100%	Clear liquid with Sharp pungent Odour.	1.245-1.255	10	

## Reactivity:

Product	:	Stable
Storage	:	Cool, dry place (temp. approx 20°C)
Testing	:	Do not exceed charge temperature of 45°C in service. Normal operational temperature range for PB acid batteries is 10-30°C.

**10. STABILITY AND REACTIVITY**

<b>CONDITIONS TO AVOID</b>	:	Prolonged overcharge; sources of ignition.
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**INCOMPATIBLE MATERIALS**

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**Sulphuric Acid:** Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulphur trioxide gas, strong oxidisers and water. Contact with metals may produce toxic sulphur dioxide fumes and may release flammable hydrogen gas.

**Lead Compounds:** Avoid contact with strong acids bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**

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**Sulphuric Acid:** Sulphur trioxide, carbon monoxide, sulphuric acid mist, sulphur dioxide and hydrogen.

**Lead Compounds:** High temperatures likely to produce toxic metal fume, vapour or dust, contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

**CHEMICAL****CHEMICAL DECOMPOSITION****HAZARDOUS CHEMICAL****BIOLOGICAL**H<sub>2</sub>SO<sub>4</sub>  
(Sulphuric Acid)Sulphur Trioxide }  
SO<sub>2</sub> (Sulphuric Dioxide) }  
Hydrogen (H<sub>2</sub>) }  
Sulphur Mist }

Combustible toxic fumes

Toxic

Flammable

Toxic

Flammable

Toxic

Stibine

Toxic odourless gas which might contain Arsine. (AsH<sub>3</sub>). Arsine is highly toxic and also odourless. Both gases are not easily detected.

Hydrogen

Highly flammable gas. Fire/explosion hazard.

Sulphur Mist

Biologically highly toxic gas.

Metal and vapour May produce other chemical side reactions. Toxic.

Sulphur dioxide Combustible toxic fumes – biological hazard.

**11. TOXICOLOGICAL INFORMATION****ACUTE TOXICITY**

:

Acute effects of overexposure to lead compounds are GI (gastrointestinal) upset, loss of appetite, constipation with cramping, difficulty in sleeping and fatigue. Exposure and/or contact with battery electrolyte (acid) may lead to acute irritation of the skin, corneal damage of the eyes, and irritation of the mucous membranes of the eyes and upper respiratory system including the lungs.

**SKIN AND EYE CONTACT**

:

Battery electrolyte (acid) may cause contact dermatitis. Battery electrolyte (acid) will irritate the eyes upon contact.

<b>CHRONIC TOXICITY</b>	:	Lead and its compounds may cause chronic anaemia, damage to the kidneys and nervous system. Lead may also cause reproductive system damage and can affect developing foetuses in pregnant women. Battery electrolyte (acid) may lead to scarring of the cornea, chronic bronchitis as well as erosion of tooth enamel in mouth breathers in repeated exposures.
<b>CARCINOGENICITY</b>	:	The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulphuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. The ACGIH has classified "strong inorganic acid mist containing sulphuric acid" as an A2 carcinogen (suspected human carcinogen). These classifications do not apply to liquid forms of sulphuric acid or sulphuric acid solutions contained within a battery. Inorganic acid mist (Sulphuric acid mist is not generated under normal use of this product. Misuse of the product, such as overcharging, may however, result in the generation of sulphuric acid mist. The IARC study classified lead as an A3 carcinogen (animal carcinogen). While the agent is carcinogenic in experiment animals at relatively high doses, the agent is unlikely to cause cancer in humans except under uncommonly high levels of exposure. For further information, see the ACGIH's pamphlet, 1996. Threshold Limit Values and Biological Exposure Indices.
<b>MUTAGENICITY</b>	:	Not known.
<b>REPRODUCTIVE HAZARDS</b>	:	Not known

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## 12. ECOLOGICAL INFORMATION

<b>AQUATIC TOXICITY</b>	:	
Sulphuric Acid:		Toxic to fish and algae Concentrations of 100% sulphuric acid greater than 1.2 mg/L may be lethal to fish. Lower pH below about 4 would induce fatalities in aquatic life.
Lead Compounds:		No specific data.

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## 13. DISPOSAL INFORMATION

Undamaged and damaged batteries	:	Store in impervious inert container and return to supplier for recycling.
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**14. TRANSPORT INFORMATION****NFPA HAZARD RATING FOR SULPHURIC ACID:**

Flammability (red) = 0

Health (blue) = 3

Reactivity (yellow) = 2

Sulphuric acid is water reactive if concentrated.

**U.S. DOT**

The transportation of wet and moist charged (moist active) batteries within the continental United States is regulated by the U.S. Dot through the Code of Federal Regulations, Title 49 (CFR 49). These regulations classify these types of batteries as a hazardous material refer to CFR 49, 173.159 For more details pertaining to the transportation of wet and moist batteries.

The shipping information is as follows:

<b>PROPER SHIPPING NAME</b>	:	Batteries wet, filled with acid.
<b>HAZARDOUS CLASS</b>	:	8
<b>UN IDENTIFICATION</b>	:	UN 2794
<b>PACKAGING GROUP</b>	:	III
<b>LABEL/PLACARD REQUIRED</b>	:	Corrosive

**IATA**

The international transportation of wet and moist charged (moist active) batteries is regulated by the International Air Transportation Association (ASATA). These regulations also classify these types of Batteries as a hazardous material. The batteries must be packed according to IATA Packaging Instruction 800. The shipping information is as follows:

<b>PROPER SHIPPING NAME</b>	:	Batteries wet, filled with acid.
<b>HAZARDOUS CLASS</b>	:	8
<b>UN IDENTIFICATION</b>	:	UN 2794
<b>PACKAGING GROUP</b>	:	III
<b>LABEL / PLACARD REQUIRED</b>	:	Corrosive

**IMDG**

The international transportation of wet and moist charged (moist active) batteries is regulated by the International Maritime Goods code (IMDG). These regulations also classify these types of batteries as a hazardous material. The batteries must be packed according to IMDG code pages 8120 and 8121. The shipping information is as follows :

<b>PROPER SHIPPING NAME</b>	:	Batteries wet, filled with acid.
<b>HAZARDOUS CLASS</b>	:	8
<b>UN IDENTIFICATION</b>	:	UN 2794
<b>PACKAGING GROUP</b>	:	III
<b>LABEL / PLACARD REQUIRED</b>	:	Corrosive

Contact your FNB representative for additional information regarding the classification of batteries. Spent lead-acid batteries are not regulated as hazardous waste by the EPA when recycled, however, state and international regulations may vary.

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**15. REGULATORY INFORMATION**

EEC HAZARD CLASSIFICATION  
RISK PHRASES  
SAFETY PHRASES  
NATIONAL LEGISLATION

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**16. OTHER INFORMATION**

First National Battery provides the information in this MSDS in good faith. However, First National Battery makes no representations as to its comprehensiveness or accuracy. This MSDS is intended, as a guide, for the appropriate precautionary handling of the material by a properly trained person using it.

Individuals receiving this information must exercise their independent judgement in determining its appropriateness for a particular process. First National Battery will not accept responsibility for damages resulting from use of or reliance upon this information.

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