



## MATERIAL SAFETY DATA SHEET

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### SECTION I: PRODUCT IDENTIFICATION

**Product Identity:**

Sealed Microcell Foam Lead Acid Battery

**Trade Name:**

Microcell Foam VRLA Rechargeable Battery

**Manufacturer:**Firefly International Energy  
6533 N. Galena Rd.  
Peoria, IL 61614**Telephone Number for Information:**

1-309-402-0701

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### SECTION II: HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Component	Chemical Name	Approx. %	OSHA PEL	ACGIH TLV	CAS#
Pb	Lead	35% by wt	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	7439-92-1
PbO <sub>2</sub>	Lead Dioxide	18% by wt.	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	1309-60-0
H <sub>2</sub> SO <sub>4</sub>	Sulfuric Acid	18% by wt.	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	7664-93-9
C (Carbon)	Carbon	3% by wt.	--	10 mg/m <sup>3</sup>	7440-44-0

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### SECTION III: PHYSICAL / CHEMICAL CHARACTERISTICS

**Boiling Point:**

Electrolyte 110°C – 112°C

**Vapor Pressure:**

Electrolyte 11.7 mm Hg at 20°C

**Vapor Density (Air = 1):**

Electrolyte 3.4

**Solubility in Water:**Lead, Lead Oxide and Lead Sulfate are insoluble in water.  
Sulfuric Acid is 100% soluble in water.**Appearance and Odor:**

The battery is a solid article with no apparent odor.

The electrolyte is a clear liquid.

**Specific Gravity (H<sub>2</sub>O = 1):**

Electrolyte 1.300

## SECTION IV: EMERGENCY AND FIRST AID PROCEDURES

### Battery Electrolyte

- Eye Contact:** Immediately remove any contact lenses if present. Flush eyes with water for at least 15 minutes. Seek medical attention immediately.
- Skin Contact:** Remove contaminated clothing. Flush with water for at least 15 minutes. Seek medical attention immediately.
- Inhalation:** Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen. Seek medical attention immediately.
- Ingestion:** Do not induce vomiting. If conscious dilute by drinking water or milk. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.
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## SECTION V: FIRE AND EXPLOSION HAZARD DATA

- Flash Point:** Not Applicable
- Flammable Limits:** Hydrogen Gas - Lower 4.10%, Upper 74.20%
- Extinguishing Media:** CO<sub>2</sub>, Dry Chemical, or Foam

### Special Fire Fighting Procedures:

If batteries are on charge, turn off power. Use positive pressure, self-contained breathing apparatus in fighting fire. Water applied to electrolyte generates heat and causes it to splatter. Wear acid resistant clothing.

### Unusual Fire and Explosion Hazards:

Hydrogen and oxygen gas are generated in batteries during normal battery operations or when on charge. Oxygen is combustible and hydrogen is flammable. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic objects to simultaneously come in contact with both the positive and negative terminals of the batteries.

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## SECTION VI: REACTIVITY DATA

- Stability:** Stable under normal conditions.
- Conditions to Avoid:** Sparks and other sources of ignition. Prolonged overcharge.

**Incompatibility:** Combination of sulfuric acid with combustibles and organic materials may cause fire and explosion. Avoid contact with strong reducing agents and metals.

**Hazardous Decomposition Products:** Sulfur oxides, carbon monoxide, carbon dioxide, and hydrogen gas.

**Hazardous Polymerization:** Will not occur.

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## SECTION VII: HEALTH HAZARD DATA

### Inhalation:

Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Sulfuric Acid: Inhalation of liquid or mist may produce severe respiratory tract irritation particularly of the mucous membranes. Severe over exposure can be fatal.

### Ingestion:

Lead Compounds: Acute ingestion may cause severe cramping, abdominal pain, nausea, vomiting, and diarrhea.

Sulfuric Acid: Ingestion of liquid or mist may produce tissue damage particularly of the mucous membranes. Severe over exposure can be fatal.

### Skin Contact:

Lead Compounds: Not absorbed through the skin.

Sulfuric Acid: Severe irritation and burns.

### Eye Contact:

Lead Compounds: May cause irritation.

Sulfuric Acid: Severe irritation, permanent eye damage, and burns. Liquids or mists may produce tissue damage particularly of the mucous membranes.

### Effects of Overexposure – Acute:

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

Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.  
Severe overexposure can be fatal.

**Effects of Overexposure – Chronic:**

Lead Compounds: Anemia, wrist drop, foot drop, kidney damage, reproductive problems in males and females.

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat, and bronchial tubes. Severe over exposure can be fatal.

**Carcinogenicity:**

Lead Compounds: Not a known human carcinogen.

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified “strong inorganic acid mist containing sulfuric acid” as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Sulfuric acid mist is not generated under normal use of this product.

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**SECTION VIII: PRECAUTIONS FOR SAFE HANDELING AND USE**

**Steps to be Taken in Case of Broken Battery Case or Electrolyte Leakage:**

Neutralize spilled electrolyte and exposed battery parts with soda ash, sodium bicarbonate, lime, etc. Do not use organic or combustible material. Wear acid resistant clothing, boots, gloves, face shield, and proper respiratory protection.

**Waste Disposal Information:**

Please observe all federal, local, and state regulations regarding the disposal of lead/acid batteries.

**Precautions to be Taken in Handling, Storing, and Transportation:**

Store in cool, dry area away from combustible materials. Store in well ventilated areas.

**Other Precautions:**

Do not charge in unventilated areas.

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**SECTION IX: CONTROL MEASURES / PERSONAL PROTECTIVE EQUIPMENT**

**Ventilation:** Under normal conditions store and handle in well ventilated areas.

**Personal Protective Equipment:**

Respiratory Protection: None required under normal conditions.

Eye Protection: Wear safety glasses with side shields, goggles, or full face shields.

Hand Protection: Wear acid resistant gloves.

Protective Clothing: Under severe exposure or emergency conditions wear acid resistant clothing, aprons, and boots.

**Work / Hygienic Practices:** Do not eat, drink, smoke, or apply cosmetics while handling batteries. Thoroughly wash hands after handling.

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**SECTION X: REGULATORY INFORMATION**

**NFPA Hazard Rating For Sulfuric Acid (Estimated):**

Health (Blue) = 3

Flammability (Red) = 0

Reactivity (Yellow) = 2

Special Hazard = -W-

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**SECTION XI: TRANSPORTATION INFORMATION**

**DOT:**

Firefly's Group 31 battery meets the non-spillable criteria listed in CFR 49, 173.159 (d) (3)(i) and (ii).

Non-spillable batteries are excepted from CFR 49, Subchapter C requirements, provided that the following criteria are met:

1. The batteries must be protected against short circuits and securely packaged.
2. The batteries and their outer packaging must be plainly and durable marked "NON-SPILLABLE" or "NON-SPILLABLE BATTERY".

The exception from CFR 49, Subchapter C translates to no proper shipping name, no hazardous class, no UN number, no packaging group and no hazardous labels when transporting a non-spillable battery.

For other “wet” batteries not determined to be non-spillable, the shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid  
Hazard Class: 8  
UN Identification: UN 2794  
Packing Group: III  
Label / Placard Required: Corrosive

**IATA:**

Firefly’s Group 31 battery meets the non-spillable criteria listed in IATA Packaging Instruction 806, as well as meeting IATA special provision A67. These batteries are excepted from all IATA regulations provided that the battery terminals are protected against short circuits. The exception from IATA regulations translates to no proper shipping name, no hazardous class, no UN number, no packaging group and no hazardous labels when transporting a non-spillable battery.

For other “wet” batteries not determined to be non-spillable, the shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid  
Hazard Class: 8  
UN Identification: UN 2794  
Packing Group: none specified  
Label / Placard Required: Corrosive

\*Batteries must be securely packed to prevent short circuiting.

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**SECTION XII: OTHER INFORMATION – NOTICE TO READERS**

**Notice to Readers – Disclaimer:**

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, Firefly Energy does not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Users should make their own investigations to determine the suitability of the information for their particular purposes. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Firefly Energy does not assume liability as a result of the battery’s use or application. This product is provided “AS IS” and without warranty of any kind, express or implied, including but not limited to implied warranties of merchantability and fitness and statutory warranty of non-infringement.

MSDS Preparation Date: 7/17/2006

MSDS Revision Date: 6/26/2012