



an EnerSys® company

# Safety Data Sheet

## EnergyCell TT Batteries

| Section I: Chemical Product and Company Identification                            |   |                     |
|---|---|---------------------|
| Chemical Trade Name (as used on battery)  | Valve Regulated Lead-Acid Battery, Non-Spillable                            |                     |
| Product Use   | Rechargeable Storage Battery  |                     |
| Manufacturer's Name   | CSB Battery Co., Ltd.   |                     |
| Address and Website   | 11F, No. 150, Sec. 4, Chengde Rd.,<br>Shilin Dist, Taipei City 11167 Taiwan | www.csb-battery.com |
| Emergency Telephone: CHEMTREC DOMESTIC: 800-424-9300 CHEMTREC INT'L: 703-527-3877 |   |                     |

| Section II: Hazard Identification  |   |   |
|--|---|---|
| <b>Classification of the Substance or Mixture</b>  |   |   |
| Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]   |   |   |
| Material is an article. No health effects are expected during normal use of this product as sold. Hazardous exposure may occur when the product is heated, oxidized or otherwise processed, damaged or subjected to misuse. Follow manufacturer's instructions for installation, service and use.  |   |   |
| No hazards occur during the normal operation of a Lead Acid Battery as it is described in the instructions for use that are provided with the Battery. Lead Acid Batteries have three significant characteristics:   |   |   |
| <ul style="list-style-type: none"> <li>They contain an electrolyte which contains diluted sulfuric acid. Sulfuric acid may cause severe chemical burns.</li> <li>During the charging process or during operation they might develop hydrogen gas and oxygen, which under certain circumstances may result in an explosive mixture.</li> <li>They can contain a considerable amount of energy, which may be a source of high electrical current and a severe electrical shock in the event of a short circuit.</li> </ul> |   |   |
| <b>NOTE:</b> The batteries must be marked with the symbols listed under Section 15.  |   |   |
| <b>Other Hazards</b>   |   |   |
| Adverse human health effects and symptoms:   |   |   |
|  | <b>Acute</b>  | <b>Chronic</b>  |
| Inhalation   | Under normal conditions of use, no health effects are expected. Contents of an open battery can cause respiratory irritation.                             | Repeated and prolonged exposure may cause irritation. |
| Skin   | Under normal conditions of use, no health effects are expected.   | No data available.                                    |
| Eye  | Under normal conditions of use, no health effects are expected. Exposure to dust may cause irritation.  | No data available.                                    |
| Ingestion  | Under normal conditions of use, no health effects are expected. Lead ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. | No data available.                                    |
| HMIS Rating for Sulfuric Acid  | Health: 3 Flammability: 0 Reactivity: 2 Other: 0  | Rating codes: 0 = Insignificant 1 = Slight            |
| NFPA Rating for Sulfuric Acid  | Health: 3 Flammability: 0 Reactivity: 2 Other: 0  | 2 = Moderate 3 = High 4 = Extreme                     |

| Section III: Composition / Information on Ingredients <sup>1</sup>   |            |           |                      |                       |                          |  |
|--|------------|-----------|----------------------|-----------------------|--------------------------|--|
| Material   | CAS Number | EC Number | OSHA PEL             | ACGIH TLV             | % By Weight <sup>2</sup> | Classification according to CLP (1272/2008)                  |
| <b>Specific Chemical Identity:</b> Lead  | 74939-92-1 | 231-100-4 | 50 µg/m <sup>3</sup> | 150 µg/m <sup>3</sup> | ~57%                     | T, R60, R61, S1, S2, S13, S35, S45, S53 <sup>3</sup>         |
| <b>Common Name:</b> Grid   |            |           |                      |                       |                          |  |
| <b>Specific Chemical Identity:</b> Lead Dioxide  | 1309-60-0  | 215-174-5 | 50 µg/m <sup>3</sup> | 150 µg/m <sup>3</sup> | ~22%                     | T, R20/22, R33, R50/53, R61, S53, S45, S60, S61 <sup>3</sup> |
| <b>Common Name:</b> Lead Oxide   |            |           |                      |                       |                          |  |
| <b>Specific Chemical Identity:</b> Sulfuric Acid   | 7664-93-90 | 231-639-5 | 1 mg/m <sup>3</sup>  | 1 mg/m <sup>3</sup>   | ~14%                     | C; R35; S1/2, S26, S30, S45                                  |
| <b>Common Name:</b> Battery Electrolyte (Acid) <sup>4</sup>  |            |           |                      |                       |                          |  |
| Plastic Container / Plastic Parts <sup>5</sup>   | —          |           |                      | ~7%                   | —                        |  |
| <b>NOTE:</b> Inorganic lead and electrolyte (sulfuric acid) are the primary components of every lead-acid battery sold by OutBack. Other ingredients may be present dependent upon battery type. Contact your OutBack representative for additional information. |            |           |                      |                       |                          |  |

<sup>1</sup> See Section 12, Ecological Information.

<sup>2</sup> Contents may vary due to performance data of the battery.

<sup>3</sup> As result of the harm to unborn children, lead and lead compounds are classified as toxic, Category 1. As this category is not described with a specific hazard symbol, lead compounds have to be labeled with the "skull & crossbones" symbol. Lead and lead compounds are not classified "toxic".

<sup>4</sup> Density of the electrolyte varies in accordance to the state of charge.

<sup>5</sup> Composition of the plastic may vary due to different customer requirements.

# Safety Data Sheet

## Section IV: First Aid Measures

### Electrolyte (Sulfuric Acid)

|                               |   |
|-------------------------------|---|
| After Skin Contact            | Rinse with water, remove and wash wetted clothing.  |
| After Inhalation of Acid Mist | Inhale fresh air, seek advice of a medical doctor   |
| After Contact with Eyes       | Rinse under running water for several minutes, seek advice of a medical doctor.                                     |
| After Swallowing              | Drink lots of water immediately, swallow activated carbon, do not induce vomiting, seek advice of a medical doctor. |

### Lead Compounds

|                         |   |
|-------------------------|---|
| After Skin Contact      | Clean with water and soap.  |
| After Contact with Eyes | Rinse under running water for several minutes, seek advice of a medical doctor. |
| After Swallowing        | Wash mouth with water, seek advice of a medical doctor.                         |

## Section V: Firefighting Measures

|  |   |                  |
|--|---|------------------|
| <b>Hydrogen Flammable Limits in Air (% by Volume):</b> |   | Flash Point: N/A |
| Lower Explosion Limit (LEL): 4.1% (Hydrogen gas)       | Upper Explosion Limit (UEL): 74.2% (Hydrogen gas)   |                  |
| Hydrogen Auto-Ignition Point: 580°C                    |   |                  |
| <b>Unusual Fire and Explosion Hazards</b>              | Hydrogen and oxygen gases are produced in cells during normal battery operation and expel into air through vent caps.   |                  |
| <b>Suitable Fire Extinguishing Agents</b>              | CO <sub>2</sub> or dry powder extinguishing agents.   |                  |
| <b>Unsuitable Fire Extinguishing Agents</b>            | Water, if the battery voltage is above 120 Vdc.   |                  |
| <b>Special Protective Equipment</b>                    | Protective goggles, respiratory protective equipment, acid protective equipment, acid proof clothing in case of larger stationary battery plants or where larger quantities are stored. |                  |
| <b>Special Firefighter Procedures</b>                  | Use positive pressure, self-contained breathing apparatus.  |                  |

## Section VI: Accidental Release Measures

### Personal Precautions, Protective Equipment and Emergency Procedures<sup>6</sup>

|                                   |  |
|-----------------------------------|--|
| <b>Eye Protection</b>             | Chemical goggles, safety glasses with side shields and or a full-face shield |
| <b>Protective Gloves</b>          | Rubber, PVC or neoprene  |
| <b>Respiratory Protection</b>     | NIOSH approved acid mist / organic vapor respirator, if OSHA PEL is exceeded |
| <b>Other Protective Equipment</b> | Acid resistant apron or clothes  |

### Environmental Precautions

Prevent entry into waterways, sewers, basements or confined areas.  
Runoff from fire control and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

### Methods and Materials for Containment and Cleanup

|                        |   |
|------------------------|---|
| <b>For Containment</b> | In the event of a battery rupturing, stop the leak if it can be done without risk. Absorb with dirt, sand, or other non-combustible material. Cautiously neutralize spilled liquid. |
| <b>For Cleanup</b>     | Dispose of substances in accordance with local, state, and national regulations.  |

## Section VII: Handling and Storage

### Handling

- Keep away from heat and sources of ignition.
- Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers, and water.
- Avoid sparks.
- There may be increased risk of electric shock from strings of connected batteries.
- Do not remove vent caps.
- Cover terminals to prevent short circuits.
- Do not stack batteries.
- Use banding or stretch wrap to secure items for shipping.

### Storage

- 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.
- Protect batteries from coming into contact with conductive materials to prevent fire or battery failures. Keep away from metallic objects which could bridge the terminals on a battery and create a dangerous short circuit.
- Do not store or charge batteries in temperatures under -40°F (-40°C).
- Keep away from fire, sparks, and heat.
- Protect from damage to prevent possible leaks or spills.

<sup>6</sup> See Section 8 for Personal Protective Equipment information.

**Section VIII: Exposure Controls / Personal Protection**

**Appropriate Engineering Controls**

Store batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.

| Substance Name | EC Number | CAS Number | Description   |
|----------------|-----------|------------|---|
| Lead           | 231-100-4 | 7439-92-1  | No exposure to lead and lead-containing battery paste during normal conditions of use.  |
| Sulfuric Acid  | 231-639-5 | 7664-93-9  | <p><b>R-phrases</b><br/>R35: Causes severe chemical burns.</p> <p><b>S-phrases</b><br/>S2: Keep out of reach of children.<br/>S16: Keep away from sparks or open flame. Do not smoke when using this product.<br/>S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br/>S45: In case of accident or if feeling unwell, seek medical advice immediately. (Show the label where possible.)</p> |

**Individual Protection Measures**

**Personal Protective Equipment:**

During installation under normal conditions there is no exposure to lead or sulfuric acid. In the event of battery breakage, exposure to sulfuric acid and lead may occur. During high rate charges or overcharging, acid mist may occur.

|                                   |   |
|-----------------------------------|---|
| <b>Eye / Face Protection</b>      | Chemical goggles, safety glasses with side shields and or a full-face shield. |
| <b>Protective Gloves</b>          | Rubber, PVC or neoprene.  |
| <b>Respiratory Protection</b>     | NIOSH approved acid mist / organic vapor respirator, if OSHA PEL is exceeded. |
| <b>Other Protective Equipment</b> | Acid resistant apron or clothes.  |

**Work Practices:**

Use standard lead-acid battery practices. Do not wear metallic jewelry when working with batteries. Use non-conductive tools only. Discharge static electricity prior to working on a battery. Ensure that there is eyewash, a fire extinguisher and an emergency communication device in the work area.

**Section IX: Physical and Chemical Properties**

| Item                                     | Lead and Lead Compounds | Electrolyte                  |
|--|-------------------------|------------------------------|
| Appearance                               | Form                    | Liquid                       |
|  | Color                   | Colorless                    |
|  | Odor                    | Odorless                     |
| pH                                       | N/A                     |                              |
| Melting Point / Freezing Point           | 327.4°C (Melting Point) | -35 to -60°C                 |
| Initial Boiling Point and Boiling Range  | 1740°C (lit.)           | ~ 108 to 114°C               |
| Flash Point, Evaporation Rate            | N/A                     |                              |
| Vapor Pressure (mm Hg @ 20°C)            | N/A                     | < 0.3 mm Hg                  |
| Vapor Density (Air = 1)                  | 7.1                     | 3.4                          |
| Density (20°C)                           | 11.35 g/cm <sup>3</sup> | 1.2 to 1.3 g/cm <sup>3</sup> |
| Solubility In Water                      | Very Low (0.15 mg/l)    | Very Low (0.15 mg/l)         |
| Partition Coefficient: N-Octanol / Water | N/A                     |                              |
| Decomposition Temperature                | N/A                     |                              |

**NOTE:** Lead and lead compounds used in lead acid batteries are poorly soluble in water. Lead can be dissolved in an acidic or alkaline environment only.

**Section X: Stability and Reactivity**

|   |  |
|---|--|
| <b>Reactivity</b>                         | Broken batteries may result in small amounts of spilled electrolyte. Electrolyte is a corrosive, nonflammable liquid. Electrolyte can destroy organic materials such as cardboard, wood and textiles. Electrolyte may produce hydrogen as a reaction with some metals. |
| <b>Chemical Stability</b>                 | The battery and contents are stable under normal conditions.   |
| <b>Possibility of Hazardous Reactions</b> | Hazardous polymerization will not occur.   |
| <b>Conditions to Avoid</b>                | Overheating or overcharging the battery may result in acid mist and hydrogen generation.   |
| <b>Materials to Avoid</b>                 | Strong alkaline materials, conductive metals, organic solvents, spark or open flame.   |
| <b>Hazardous Byproduct</b>                | Hydrogen gas may be generated in an overcharge condition, in fire or at very high temperatures. In a fire, it may emit CO, CO <sub>2</sub> and sulfur oxides.  |

# Safety Data Sheet

## Section XI: Toxicological Information

### Information on Toxicological Effects

EnergyCell TT batteries are a sealed, recombinant design that require no water replacement throughout their service life, thus no contact is made with the battery's internal components or chemical hazards. Under normal use and handling, these batteries do not emit regulated or hazardous substances.

Sulfuric Acid (7664-93-9)

| Administration Route              | Method | Dose                  | Test Animal |
|-----------------------------------|--------|-----------------------|-------------|
| Acute Oral Toxicity               | LD50   | 2140 mg/kg            | Rat         |
| Acute Inhalative Toxicity (Vapor) | LC50   | 510 mg/m <sup>3</sup> | Rat         |

### Route of Exposure

|            |  |   |
|------------|--|---|
| Inhalation | Under normal conditions of use, no health effects are expected. Contents of an open battery can cause respiratory irritation.                            | Repeated and prolonged exposure may cause irritation. |
| Skin       | Under normal conditions of use, no health effects are expected.  | No data available.                                    |
| Eye        | Under normal conditions of use, no health effects are expected. Exposure to dust may cause irritation.   | No data available.                                    |
| Ingestion  | Under normal conditions of use, no health effects are expected. Lead ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. | No data available.                                    |

The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Group 1 carcinogen (inhalation), 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. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.

## Section XII: Ecological Information

This information is of relevance if the battery is broken and the ingredients are released to the environment.

### Electrolyte (diluted sulfuric acid)

In order to avoid damage to the sewage system, the acid must be neutralized by means of time or sodium carbonate before disposal. Ecological damage is possible by change of pH. The electrolyte solution reacts with water and organic substances, causing damage to flora and fauna. The electrolyte may also contain soluble components of lead that can be toxic to aquatic environments.

### Lead and Lead compounds

Chemical and physical treatment is required for the elimination from water. Waste water containing lead must not be disposed of in an untreated condition. The former classification of lead compounds as toxic for the aquatic environment R50/53 had been triggered from test results generated in the 1980s for soluble lead compounds (lead acetate). The hardly soluble lead compounds such as battery lead oxide were not tested at this time. Tests on battery lead oxide were carried out in 2001 and 2005. The respective test results conclude that battery lead oxide is not toxic for the environment, neither R50 nor R50/53 nor R51/53. From this it follows that the general classification for lead compounds (R50/53) does not apply to battery lead oxide. As the result of this the Risk Phrase R52/53 (Harmful to aquatic organisms, may cause long term adverse effects in the aquatic environment) applies to battery lead oxide.

### Effects of battery lead oxide in the aquatic environment:

**Toxicity for fish:** 96 h LC 50 > 100 mg/l

**Toxicity for daphnia:** 48 h EC 50 > 100 mg/l

**Toxicity for algae:** 72 h IC 50 > 10 mg/l

The results demonstrate these battery lead oxide compounds in a concentration of 100 mg/l have no adverse effect on fish and daphnia. A concentration of these battery lead oxide of 10 mg/l has no adverse effect on the rate of growth and the biomass. For the classification according to Directive 67/548/EEC the most sensitive adverse effect has to be considered. As a result of the toxicity for algae at > 10 mg/l battery lead oxide has to be classified according to the R-Phrases 52/53 (Harmful to aquatic organisms, may cause long term adverse effects in the aquatic environment).

## Section XIII: Disposal Considerations

Spent lead acid batteries (EWC 160601) are subject to regulation of the EU Battery Directive and its adoptions into national legislation on the composition and end of life management of batteries.

Spent lead-acid batteries are recycled in lead refineries (secondary lead smelters). The components of a spent lead-acid battery are recycled or reprocessed.

At the points of sale, the manufacturers and importers of batteries, respectively the metal dealers take back spent batteries, and render them to the secondary lead smelters for processing.

To simplify the collection and recycling or reprocessing process, spent lead-acid batteries must not be mixed with other batteries. The electrolyte (diluted sulfuric acid) may not be emptied in an inexperienced manner. This process is to be carried out by the processing companies only.

**Section XIV: Transport Information**

All EnergyCell TT batteries are identified as “Battery, Electric Storage, Nonspillable” when transported by air, sea or by land transportation. The battery(s) must be identified as above on the Bill of Lading and properly packaged with the battery terminals protected from short circuit. NA or UN numbers do not apply. The EnergyCell TT battery(s) warning label identifies each battery as NONSPILLABLE.

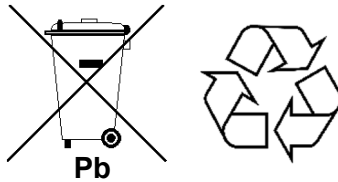
EnergyCell TT sealed lead-acid batteries are classified as “Nonspillable” for the purpose of transportation by DOT, and IATA/ICAO as result of passing the Vibration and Pressure Differential Test described in DOT [49 CFR 173.159(f)] and IATA/ICAO [Special Provision A67]. EnergyCell TT sealed lead-acid batteries can be safely transported on deck, or under deck stored on either a passenger or cargo vessel as result of passing the Vibration and Pressure Differential Tests as described in the IMDG regulations (Special Article 238).

To transport these batteries as “Nonspillable” they must be shipped in a condition that would protect them from short-circuits and be securely packaged so as to withstand conditions normal to transportation by a consumer, in or out of a device, they are unregulated thus requiring no additional special handling or packaging.

For all modes of transportation, each battery and outer package is labeled “NON-SPILLABLE” per 49 CFR 173.159(f). If you repackage our batteries either as batteries or as a component of another product you must label the outer package “NON-SPILLABLE” per 49 CFR 173.159(f).

**Section XV: Regulatory Information**

In accordance with EU Battery Directive and the respective national legislation, lead-acid batteries must be marked by a crossed-out dust bin with the chemical symbol for lead shown below, together with the ISO return/recycling symbol.



In addition, some of the following hazard symbols described below may apply:



**Corrosive**



**Explosive Gas Mixture**



**Read Instructions**



**Keep Out of Reach of Children**



**No Smoking, Open Flames, or Sparks**



**Wear Safety Goggles**

**STATE REGULATIONS (U.S.)**

|                       |  |
|-----------------------|--|
| <b>Proposition 65</b> | Warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer. Batteries also contain other chemicals known to the state of California to cause cancer. Wash hands after handling. |
|-----------------------|--|

**International Regulations (non-U.S.)**

|                                      |   |
|--------------------------------------|---|
| <b>National Regulations (Canada)</b> | Canadian Domestic Substance List (DSL): <ul style="list-style-type: none"> <li>All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.</li> </ul> Canada NDSL: <ul style="list-style-type: none"> <li>None of the components on this SDS are listed on the Canadian NDSL.</li> </ul> |
| <b>WHMIS Classifications</b>         | Class E: Corrosive materials present at greater than 1% <ul style="list-style-type: none"> <li>This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR). This SDS contains all the information required by the CPR.</li> </ul>  |

# Safety Data Sheet

## Section XVI: Other Information

Products such as batteries are not in the scope of regulation which requires the publication of an EU Safety Data Sheet (91/155/EEC).

The information given above is provided in good faith based on existing knowledge and does not constitute an assurance of safety under all conditions. It is the user's responsibility to observe all laws and regulations applicable for storage, use, maintenance or disposal of the product. If there are any queries, the supplier should be consulted. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

The contents and format of this SDS are in accordance with EEC Commission Directive 1999/45/EC, 67/548/EC, 1272/2008/EC and EEC Commission Regulation 1907/2006/EC (REACH) Annex II.

## OutBack Power

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