

Extremely flammable gas (hydrogen).

Explosive, fire, blast, or projection hazard.

Safety Data Sheet

Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid.

EnergyCell FLA Batteries

Section I: Chemical Product and Company Identification		
Chemical Trade Name (as used on battery)	Lead Acid Batteries: Deep Cycle & Industrial	
Chemical Formula/Product Use	Batteries, wet, filled with acid PbO ₂ + Pb + 2H ₂ SO ₄ = 2PbSO ₄ + 2H ₂ O	
UN Identification:	UN2794	
Manufacturer's Name:	Crown Battery Manufacturing Company	
Address and Telephone:	P.O. Box 990 1445 Majestic Drive, Fremont, Ohio 43420	Telephone: +1.419.334.7181 Web site: www.crownbattery.com
North America 24-Hour Emergency (CHEMTREC Domestic): International 24-Hour Emergency (CHEMTREC International):	+1.800.424.9300 +1.703.527.3887	

Section II: Hazard Identification			
HEALTH		ENVIRONMENTAL	PHYSICAL

Acute Toxicity (Oral/Dermal/Inhalation)	Category 4		
Skin Corrosion/Irritation	Category 1A		
Eye Damage	Category 1		
Reproductive	Category 1A	Aquatic Chronic 1	
Carcinogenicity (lead compounds)	Category 1B		Explosive Chemical, Division 1.3
Carcinogenicity (arsenic)	Category 1A	Aquatic Acute 1	
Carcinogenicity (acid mist) Category 1.			
Specific Target Organ Toxicity (repeated exposure)	Category 2		
Hazard Statements		Precautionary Statem	ents
DANGER		Wash thoroughly aft	er handling.
Causes severe skin burns and eye damage	Э.	Do not eat, drink, or	smoke when using this product.
Causes serious eye damage.		Avoid breathing dust/fume/gas/mist/vapors/spray.	
May damage fertility or the unborn child if ingested or inhaled.		Use only outdoors or in a well-ventilated area.	
Causes damage to central nervous system, blood, and kidneys through prolonged or repeated exposure.		Wear protective glov face protection.	res/protective clothing, eye protection/
May cause cancer if ingested or inhaled.		Irritating to eyes, respiratory system, and skin.	
May form explosive air/gas mixture during of	charging.	Causes skin irritation	n, serious eye damage.

Section III: Composition / Information on Ingredients			
Material	CAS Number	% By Weight	
Lead and Lead Compounds (inorganic)	7439-92-1	50 to 70	
Antimony	7440-36-0	0.1 to .99	
Sulfuric Acid	7664-93-9	3 to 5	
Inert Components (Separator Material)	N.A.	1 to 2	
Water	7732-18-5	23 to 25	
NOTE: Inorganic lead and electrolyte (sulfuric acid) are the primary dependent upon battery type. Contact your OutBack representative		her ingredients may be present	

908-0006-01-00 Rev A

Section IV:	First Aid Me	asures	
Inhalation	Sulfuric Acid	Remove to fresh air immediately. If breathing is difficult, give oxygen. Consult a physician.	
	Lead	Remove from exposure, gargle, wash nose and lips; consult physician.	
Ingestion	Sulfuric Acid	Give large quantities of water; do not induce vomiting, or aspiration into the lungs may occur and can cause permanent injury or death; consult physician.	
	Lead	Consult physician immediately.	
Skin Exposure	Sulfuric Acid	Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes. If symptoms persist, seek medical attention. Wash contaminated clothing before reuse. Discard contaminated shoes.	
	Lead	Wash immediately with soap and water.	
Eye Exposure	Sulfuric Acid and Lead	Flush immediately with large amounts of water for at least 15 minutes while lifting lids. Seek immediate medical attention if eyes have been exposed directly to acid.	

Section V: Firefighting Measures

Hydrogen Flammable Limits (% by Volume):

Lower Explosion Limit (LEL): 4.1% (Hydrogen Gas in Air) Upper Explosion Limit (UEL): 74.2%

Flash Point: N/A

Extinguishing Media

CO₂; foam; dry chemical. Do not use carbon dioxide directly on cells. Avoid breathing vapors. Use appropriate media for surrounding fire.

Firefighting Procedures

Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Hazardous Combustion Products

Highly flammable hydrogen gas is generated during charging and operation of batteries. If ignited by burning cigarette, naked flame or spark, this may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. To avoid risk of 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 instructions for installation and service.

Section VI: Accidental Release Measures

Spill or Leak Procedures

Stop flow of material. Contain/absorb small spills with dry sand, earth, and vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of non-neutralized acid to sewer. Acid must be managed in accordance with local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

Section VII: Handling and Storage

Handling

- Unless involved in recycling operations, do not breach the casing or empty the contents of the battery.
- Handle carefully and avoid tipping, which may allow electrolyte leakage.
- There may be increased risk of electric shock from strings of connected batteries.
- Keep containers tightly closed when not in use. If battery case is broken, avoid contact with internal components.
- Keep vent caps on and cover terminals to prevent short circuits. Do not stack batteries.
- Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers, and water. 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.
- Separate from incompatible materials. Avoid damage to containers.
- Store and handle only in areas with adequate water supply and spill control.
- Keep away from fire, sparks, and heat.
- Keep away from metallic objects which could bridge the terminals on a battery and create a dangerous short-circuit.

Charging

- Shut off power to chargers whenever not in use and before detachment of any circuit connections.
- There is a possible risk of electric shock from charging equipment and from strings of series-connected batteries, whether or not being charged.
- Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby.
- Wear face and eye protection when near batteries being charged.

Section VIII: Exposure Controls / Personal Protection						
INGREDIENTS	Exposure limits are measured in mg/m ³					
(Chemical/Common Names)	OSHA PEL ACGIH US NIOSH Quebec PEV Ontario OEL EU OE					EU OEL
Lead and Lead Compounds (inorganic)	0.05	0.05	0.05	0.05	0.05	0.15 (b)
Electrolyte (H ₂ SO ₄ /H ₂ 0)	1	0.2	1	1	0.2	0.05 (c)
Antimony	0.5	0.5	0.5	0.5	0.5	0.5 (b,e)
ABBREVIATIONS N.E.= Not Established OEL = Occupational Exposure Limit PEL = Permissible Exposure Limit	NOTES (a) As inhalable aerosol (b) Thoracic fraction (c) Based on OFLs of Austria, Belgium, Denmark, France, Netherlands, Switzerland, & U.K.					

Engineering Controls (ventilation)

- Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.
- Handle batteries cautiously to avoid spills.
- Make certain vent caps are on securely.
- If battery case is damaged, avoid bodily contact with internal components.
- Wear protective clothing, eye, and face protection when filling, charging, or handling batteries.
- Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries.
- Charge the batteries in areas with adequate ventilation. General dilution ventilation is acceptable.

Respiratory Protection (NIOSH/MSHA approved)

 None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection.

Skin Protection

 If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing, and boots.

Eye Protection

If battery case is damaged, use chemical goggles or face shield.

Other Protection

- In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.
- Chemically impervious apron and face shield recommended when adding water or electrolyte to batteries. Wash hands after handling.

Section IX: Physical and Chemical Properties			
Properties Listed Below are for Electrolyte:			
Boiling Point:	203° to 240° F	Specific Gravity (H₂O = 1):	1.215 to 1.350
Melting Point:	N/A	Vapor Pressure (mm Hg):	10
Solubility in Water:	100%	Vapor Density (AIR = 1):	Greater than 1
Evaporation Rate: (Butyl Acetate = 1)	Less than 1	% Volatile by Weight:	N/A
pH:	~1 to 2	Flash Point:	Below room temperature (as hydrogen gas)
LEL (Lower Explosive Limit):	4.1% (Hydrogen)	UEL (Upper Explosive Limit):	74.2% (Hydrogen)
Appearance and Odor:	 Battery is a manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor. 		

Section X: Sta	bility and Re	eactivity
Stability:	Stable X	Unstable
This product is stable	e under normal c	onditions at ambient temperature.
Conditions To Av	oid: Prolonged	overcharge at high current; sources of ignition
Incompatibility (Materials to Avoid)	Electrolyte	Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Avoid)	Lead Compounds	Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.
	Arsenic Compounds	Strong oxidizers; bromine azide. NOTE : Hydrogen gas can react with inorganic arsenic to form highly toxic arsine gas.
Hazardous	Electrolyte	Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.
Decomposition Products	O	Temperatures above the melting point are 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.
Floudels	1 -	

908-0006-01-00 Rev A 3

Hazardous Polymerization: Will not occur.

Section XI: To	xicological Inforn	nation
Routes of Entry	Sulfuric Acid	Harmful by all routes of entry.
,	Lead Compounds	Hazardous exposure can occur only when product is heated, oxidized, or otherwise processed or damaged to create dust, vapor, or fume. The presence of nascent hydrogen may generate highly toxic arsine gas.
Inhalation	Sulfuric Acid	Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.
	Lead Compounds	Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.
Ingestion	Sulfuric Acid	May cause severe irritation of mouth, throat, esophagus, 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.
Skin Contact	Sulfuric Acid	Severe irritation, burns, and ulceration.
	Lead Compounds	Not absorbed through the skin.
	Arsenic Compounds	Contact may cause dermatitis and skin hyper-pigmentation.
Eye Contact	Sulfuric Acid	Severe irritation, burns, cornea damage, and blindness.
	Lead Compounds	May cause eye irritation.
Effects of	Sulfuric Acid	Severe skin irritation, damage to cornea, upper respiratory irritation.
Overexposure (Acute)	Lead Compounds	Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances, and irritability.
Effects of	Sulfuric Acid	Possible erosion of tooth enamel; inflammation of nose, throat, and bronchial tubes.
Overexposure (Chronic)	Lead Compounds	Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50 mcg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy, and damage to the blood-forming (hematopoietic) tissues.
Carcinogenicity	Sulfuric Acid	The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Group 1 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. 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.
	Lead Compounds	Lead is listed as a Group 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.
	Arsenic	Listed by National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

Medical Conditions Generally Aggravated by Exposure:

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

Acute	Inhalation	LD50	Oral	LD50
Toxicity	Electrolyte	LC50 rat: 375 mg/m ³	Electrolyte	Rat: 2140 mg/kg
102110110	-	LC50 guinea pig: 510 mg/m ³		
	Elemental Lead	Acute Toxicity Point Estimate =	Elemental Lead	Acute Toxicity Estimate = 500 mg/kg
		4500 ppmV (based on lead bullion)		body weight (based on lead bullion)
	Elemental Arsenic	No data	Elemental Arsenic	LD50 mouse: 145 mg/kg
			Elemental Antimony	LD50 rat: 100 mg/kg

Additional Health Data:

All heavy metals, including the hazardous ingredients in this product, are taken into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by adequate precautions such as the ventilation and respiratory protection covered in Section 8. Follow good personal hygiene to avoid inhalation and ingestion: wash hands, face, neck, and arms thoroughly before eating, smoking, or leaving the worksite. Keep contaminated clothing out of non-contaminated areas or wear cover clothing when in such areas. Restrict the use and presence of food, tobacco, and cosmetics to non-contaminated areas. Work clothes and work equipment used in contaminated areas must remain in designated areas and never be taken home or laundered with personal non-contaminated clothing. This product is intended for industrial use only and should be isolated from children and their environment.

The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction.

Risk phrase 61: May cause harm to the unborn child; applies to lead compounds, especially soluble forms.

Section XII: Ed	cological Infor	mation	
Environmental Fa	ate: Lead is very p	ersistent in soil and sediments. No data on environmental degradation. Mobility of metallic	
		s slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little I chain. Most studies include lead compounds and not elemental lead.	
Environmental	Sulfuric Acid	24 hr LC50, freshwater fish (Brachydanio rerio): 82 mg/L	
Toxicity		96 hr LOEC, freshwater fish (Cyprinus carpio): 22 mg/L	
	Lead	48 hr LC50 (modeled for aquatic invertebrates): <1 mg/L, based on lead bullion	
	Arsenic	24 hr LC50, freshwater fish (Carrassisus auratus): >5000 g/L	

Additional Information:

• No known effects on stratospheric ozone depletion

- Volatile organic compounds: 0% (by Volume)
- Water Endangering Class (WGK): NA

Section XIII:	Disposal Considerations (United States)
Spent	Send to secondary lead smelter for recycling. Spent lead-acid batteries are not regulated as hazardous waste
batteries	when the requirements of 40 CFR Section 266.80 are met. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).
Electrolyte	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. Consult state environmental agency and/or federal EPA.
NOTE: Following loca	al State/Provincial and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end user

Section XIV: Transport Information

United States

The U.S. Department of Transportation (DOT) hazardous materials regulations (49 CFR) applicable to lead acid batteries are specified in 49 CFR 173.159.

Proper Shipping Name: Batteries, wet, filled with acid

Hazard Class: 8 ID Number: UN2794 Packing Group: N/A Labels: Corrosive

49 CFR 173.159(e) specifies that when transported by highway or rail, electric storage batteries containing electrolyte or corrosive battery fluid are not subject to any other requirements of this subchapter, if all of the following are met:

- 1) No other hazardous materials may be transported in the same vehicle;
- 2) The batteries must be loaded or braced so as to prevent damage and short circuits in transit;
- Any other material loaded in the same vehicle must be blocked, braced, or otherwise secured to prevent contact with or damage to the batteries; and
- 4) The Transport vehicle may not carry material shipped by any person other than the shipper of the batteries.

If any of the above-referenced requirements are not met, the batteries must be shipped as fully-regulated Class 8 Corrosive hazardous materials.

IATA Dangerous Goods Regulations	The shipping information is as follows: Proper Shipping Name: Batteries, wet, filled with acid Packing Group: N/A Hazardous Class: 8 Label/Placard Required: Corrosive UN Identification: UN2794
	Reference: IATA Packing Instruction 870 (IATA DGR 56 th Edition)
IMDG Code	The shipping information is as follows: Proper Shipping Name: Batteries, wet, filled with acid Packing Group: N/A Hazardous Class: 8 Label/Placard Required: Corrosive UN Identification: UN2794 Reference: IMDG Code Packing Instruction P801

Section XV: Regulatory Information EPCRA Sections 302, 304, 311 & 312 United States Lead-acid batteries do NOT meet the OSHA definition of an "article" (US EPA, OCT. 1998). The lead and acid **EPA** that compose these batteries must be included when determining the various thresholds for these EPCRA section **SARA Title III** regulations. The acid in lead-acid batteries is sulfuric acid, which is an Extremely Hazardous Substance (EHS). The following table outlines the applicable EPCRA Sections and their respective thresholds for sulfuric acid: **EPCRA Sections — Sulfuric Acid** Thresholds 302 — Emergency Planning Notification TPQ ≥ 1,000 lbs 304 — Emergency Release Notification RQ ≥ 1,000 lbs *TPQ ≥ 500 lbs. 311 — MSDS Reporting 312 - Chemical Inventory Reporting (i.e. Tier II) *TPQ ≥ 500 lbs. The lead used in lead-acid batteries does not qualify for any OSHA or EPCRA exemptions. Lead is NOT an EHS, and the following table outlines the applicable EPCRA Sections and their respective thresholds for lead: **EPCRA Sections — LEAD** Thresholds 311 — MSDS Reporting ≥ 10,000 lbs. 312 - Chemical Inventory Reporting (i.e. Tier II) ≥ 10,000 lbs.

908-0006-01-00 Rev A 5

^{*}The reporting threshold for sulfuric acid is ≥ the designated TPQ or 500 lbs., whichever is less

United States	EPCRA Section 313				
EPA SARA Title III (continued)	The reporting of lead and sulfuric acid (and their releases) in lead-acid batteries used in cars, trucks, most cranes, forklifts, locomotive engines, and aircraft for the purposes of EPCRA Section 313 is not required. Lead-acid batteries used for these purposes are exempt for Section 313 reporting per the "Motor Vehicle Exemption." See page B-22 of the U.S. EPA Guidance Document for <i>Lead and Lead Compound Reporting</i> under EPCRA Section 313 for additional information of this exemption. Supplier Notification: This product contains toxic chemicals that may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. For a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:				
	Lead	7439-92-1		?	
	Sulfuric Acid/Water Solution	7664-93-9		?	
	Antimony	7440-36-0		?	
	Arsenic	7440-38-2		?	
	Tin	7440-31-5		?	
	TSCA	Section 8b Inventory Status		All chemicals comprising this product are either exempt or listed on the TSCA Inventory.	
Section 12b (40 CFR Part 707.60[b])		No notice of export will be required for articles, except PCB articles, unless the Agency so requires in the context of individual section 5, 6, or 7 actions.			
Section 13 (40 CFR Part 707.20)		No import certification required (EPA 305-B-99-001, June 1999, Introduction to the Chemical Import Requirements of the Toxic Substances Control Act, Section IV.A).			
RCRA	Spent lead-acid batteries are subject to streamlined handling requirements when managed in compliance with 40 CFR section 266.80 or 40 CFR part 273. Waste sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).				
STATE	Proposition 65				
REGULATIONS	Warning:				
(U.S.)	Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.				
INTERNATIONAL	Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).				
REGULATIONS	Distribution into the EU to follow applicable Directives to the use, import, and export of the product as				

Section XVI: Other Information		
NFPA Hazard Rating for Sulfuric Acid	Flammability (Red) = 0 Health (Blue) = 3	Reactivity (Yellow) = 2 X= Acid
	Sulfuric acid is water-reactive if concentrated.	

OutBack Power Technologies

Corporate Headquarters

European Office

17825 – 59th Avenue N.E.

Suite B

Arlington, WA 98223 USA

European Office

Hansastrasse 8
D-91126
Schwabach, Germany

Website: http://www.outbackpower.com

Notice of Copyright

Safety Data Sheet EnergyCell FLA Batteries © 2017 by OutBack Power Technologies. All Rights Reserved.

Part Number, Revision and Date

908-0006-01-00 Rev A, May 2017