

## an EnerSys company

# Safety Data Sheet NorthStar Batteries

Section I: Chemical Product and Comp	any Identification		
Chemical Trade Name (as used on battery)	Lead-Acid Battery, Non-Spillable, Wet		
Product Use	Electric Storage Battery	Electric Storage Battery	
Manufacturer's Name	NorthStar Battery Co., LLC		
Synonyms	Industrial Battery, Traction Battery, Stationary Battery, Deep Cycle Battery		
Address and Telephone	4000 E. Continental Way, Springfield, MO 65803		
Emergency Telephone: CHEMTREC DOMESTIC: 8	800-424-9300 CHEMTREC INT'L: 703-527-3877		

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	Explosive Chemical,
Carcinogenicity (lead)	Category 1B	Aquatic Acute 1	Division 1.3
Carcinogenicity (arsenic)	Category 1A		
Carcinogenicity (acid mist)	Category 1A		
Specific Target Organ Toxicity (repeated exposure)	Category 2		

## **Hazard Statements**

## **DANGER**

- Causes severe skin burns and eye damage.
- May damage fertility or the unborn child if ingested or inhaled
- May cause cancer if ingested or inhaled.
- Causes damage to central nervous system, blood, and kidneys through prolonged or repeated exposure.
- May form explosive air/gas mixture during charging.
- Extremely flammable gas (hydrogen).
- Explosive, fire, blast, or projection hazard.

## **Precautionary Statements**

- Wash thoroughly after handling.
- Do not eat, drink, or smoke when using this product.
- Wear protective gloves/protective clothing, eye protection/ face protection.
- Avoid breathing dust / fume / gas / mist / vapors / spray.
- Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid.
- Irritating to eyes, respiratory system, and skin.
- Use only outdoors or in a well-ventilated area.

Section III: Composition / Information on Ingredients			
Material	CAS Number	% By Weight	
Lead and Lead Compounds (inorganic)	7439-92-1	50	
Electrolyte (H <sub>2</sub> SO <sub>4</sub> / H <sub>2</sub> O)	7664-93-9	17	
Lead Oxide	1309-60-0	20	
Tin	7440-31-5	0.2	

**NOTE:** 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.

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Section IV:	First Aid Me	asures	
Inhalation	Sulfuric Acid	Remove to fresh air immediately. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult 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**

Lower Explosion Limit (LEL): 4.1% (Hydrogen gas) Upper E

Upper Explosion Limit (UEL): 74.2% (Hydrogen gas) Flash Point: N/A

#### **Extinguishing Media**

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

#### **Special Firefighting Procedures**

Use positive pressure, self-contained breathing apparatus. Water applied to electrolyte generates heat and causes it to spatter. 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, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. 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

- Always follow warning information and instructions provided with the batteries and any device connected to them.
- 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. 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.
- 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						
		Expo	osure limits are	measured in r	ng/m³	
INGREDIENTS (Chemical/Common Names)	OSHA PEL	ACGIH	US NIOSH	Quebec PEV	Ontario OEL	EU OEL
Lead and Lead Compounds (inorganic)	0.05	0.05	0.05	0.05	0.05	0.15 (b)
Electrolyte (H <sub>2</sub> SO <sub>4</sub> / H <sub>2</sub> O)	1	0.2	1	1	0.2	0.05 (c)
Tin	2	2	2			
ABBREVIATIONS N.E.= Not Established OEL = Occupational Exposure Limit	NOTES (b) As inhalable ae (c) Thoracic fraction					

#### **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. Avoid 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 (Permissible Exposure Limit), 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.
- Under severe exposure conditions, wear acid-resistant clothing and boots.

Section IX: Physical an	d Chemical Pro	perties	
Properties Listed Below are	e for Electrolyte:		
Specific Gravity (H <sub>2</sub> O = 1):			
Silver Product	1.320 +/- 0.01		
BLUE® Product	1.280 +/- 0.01	Annearones and Oderi	Manufactured article; no apparent odor.
RED® Product	1.320 +/- 0.01	Appearance and Odor:	Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.
BLUE+® Product	1.320 +/- 0.01		ponetialing, pangoni odon
Boiling Point:	203 to 240 °F		
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)

Section X: Stability and Reactivity				
	<b>Stability</b> Thi	Stable X Unstables product is stable under normal conditions at ambient temperature.		
Conditions To Av	void: Prolonged	I overcharge at high current; sources of ignition		
Incompatibility (Materials to	Sulfuric Acid	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	void contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, eroxides, nascent hydrogen, and reducing agents.		
Hazardous	Electrolyte	Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.		
Decomposition Products	Lead Compounds	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.		
Hazardous Polyn	nerization: Wi	Il not occur.		

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Section XI: To	Section XI: Toxicological Information		
Non-human Toxic	cological Data: Not a	vailable	
	Sulfuric Acid	Harmful by all routes of entry.	
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 irritation of upper respiratory and lungs.	
innaiation	Lead Compounds	Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.	
	Sulfuric Acid	May cause severe irritation of mouth, throat, esophagus, and stomach.	
Ingestion	Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and sever cramping. This may lead rapidly to systemic toxicity and must be treated by a ph		
Skin Contact	Sulfuric Acid	Severe irritation, burns and ulceration.	
Skin Contact	Lead Compounds	Not absorbed through the skin.	
Eva Cantact	Sulfuric Acid	Severe irritation, burns, cornea damage, and blindness.	
Eye Contact	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.	
	Sulfuric Acid	Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.	
Effects of 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 50mcg / 100 m 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 2A carcinogen, likely in animals at extreme doses. Per the guidance found in OSHA 29 CFR 1910.1200 Appendix F, this is approximately equivalent to GHS Category 1B. Proof of carcinogenicity in humans is lacking at present.	

#### **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 <sup>3</sup>	Electrolyte	Rat: 2140 mg/kg
		LC50 guinea pig: 510 mg/m³		
	Elemental Lead	Acute Toxicity Point Estimate = 4500 ppmV	Elemental Lead	Acute Toxicity Estimate =
		(based on lead bullion)		500 mg/kg body weight
				(based on lead bullion)

## **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 19<sup>th</sup> 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: E	cological Infor	mation	
Environmental Fate	Lead is very persistent in soil and sediments. No data on environmental degradation. Mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds and not elemental lead.		
Environmental	Aquatic Toxicity		
Toxicity	Sulfuric Acid	Sulfuric Acid 24 hr LC50, freshwater fish (Brachydanio rerio): 82 mg/L	
- Controlley		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		
	Additional • No known effects on stratospheric ozone depletion		
	information:	Volatile organic compounds: 0% (by Volume)	
		Water Endangering Class (WGK): NA	

Section XIII:	Disposal Considerations (United States)
Spent batteries	Send to secondary lead smelter for recycling. Spent lead-acid batteries are not regulated as hazardous waste when the requirements of 40 CFR Section 266.80 are met. This should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.
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.

Section XIV: Transport Information				
U.S. DOT	•	<ul> <li>Excepted from the hazardous materials regulations (HMR) because the batteries meet the requirements of 49 CFR 173.159(f) and 49 CFR 173.159a of the U.S. Department of Transportation's HMR.</li> </ul>		
	•	Battery and outer package must be marked "NONSPILLABLE" or "NONSPILLABLE BATTERY"		
	•	Battery terminals must be protected against short circuits.		
IATA Dangerous Goods	•	Excepted from the dangerous goods regulations because the batteries meet the requirements of		
Regulations DGR	Packing Instruction 872 and Special Provisions A67 of the International Air Transportation Association (IATA) Dangerous Goods Regulations and International Civil Aviation Organiz (ICAO) Technical Instructions.			
	•	Battery terminals must be protected against short circuits.		
	•	The words "NOT RESTRICTED, SPECIAL PROVISION A67" must be provided on an air waybill when the air waybill is issued.		
IMDG	•	<ul> <li>Excepted from the dangerous goods regulations for transport by sea because the batteries meet the requirements of Special Provision 238 of the International Maritime Dangerous Goods (IMDG CODE).</li> </ul>		
	•	Battery terminals must be protected against short circuits.		

Section XV: Regulatory Information					
United States EPA SARA Title III	Section 302 EPCRA Extremely Hazardous Substances (EHS)	Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of 1,000 lbs. EPCRA Section 302 notification is required if 1,000 lbs. or more of sulfuric acid is present at one site (40 CFR 370.10). For more information consult 40 CFR Part 355. The quantity of sulfuric acid will vary by battery type. Contact your OutBack representative for additional information.			
	Section 304 CERCLA Hazardous Substances	Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is 1,000 lbs. State and local reportable quantities for spilled sulfuric acid may vary.			
	Section 311/312 Hazard Categorization	EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of 500 lbs. or more and/or if lead is present in quantities of 10,000 lbs. or more. For more information consult 40 CFR 370.10 and 40 CFR 370.40.			
	Section 313 EPCRA Toxic Substances	40 CFR section 372.38 (b) states: If a toxic chemical is present in an article at a covered facility, a person is not required to consider the quantity of the toxic chemical present in such article when determining whether an applicable threshold has been met under § 372.25, § 372.27, or § 372.28 or determining the amount of release to be reported under § 372.30. This exemption applies whether the person received the article from another person or the person produced the article. However, this exemption applies only to the quantity of the toxic chemical present in the article.			

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Section XV: Reg	Section XV: Regulatory Information (continued)							
United States EPA SARA	Supplier Notification: This product contains toxic chemicals, which may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. If you are a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:							
Title III	Toxic Che	mical	CAS Number	Approximate % by Weight				
(continued)	Lead		7439-92-1	50				
	Electrolyte (Sulfurio	Acid / Water)	7664-93-9	17				
	Lead Ox	kide	1360-60-0	20				
	Tin		7440-31-5	0.2				
	See 40 CFR Part 370 for more details.							
TSCA	Section 8b Inventory Status	All chemicals compr Inventory.	ising this product are either e	xempt or listed on the TSCA				
	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	<ul> <li>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.</li> <li>Waste sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).</li> </ul>							
CAA	EnerSys supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFCs and other ozone depleting chemicals (ODCs), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, EnerSys established a policy to eliminate the use of Class I ODCs prior to the May 15, 1993 deadline.							
STATE REGULATIONS (U.S.)	Proposition 65**	Warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.						
INTERNATIONAL REGULATIONS	<ul> <li>Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).</li> <li>Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as sold.</li> </ul>							

<sup>\*</sup>The reporting threshold for sulfuric acid is ≥ the designated TPQ or 500 lbs., whichever is less
\*\*Battery companies not party to the 1999 consent judgment with Mateel Environmental Justice Foundation should include a Proposition 65 Warning that complies with the current version of Proposition 65

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

## **OutBack Power**

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## **Part Number, Revision and Date**

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