ADV384812
ADV384813

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MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD ACID BATTERY, NON-SPILLABLE (US, CN, EU Version for International Trade)

SECTION 1: IDENTIFICATION

Product/Chemical Name: Valve Regulated Lead Acid Battery	**Chemical Family/Classification:** Gel/absorbed electrolyte type lead acid storage battery
Other Product Names: EV Traction Dry Cell, Gel Absorbed Electrolyte Sealed Valve Regulated Battery Non-Spillable 49 CFR 173, 159(d).	**Product Use:** Electrical storage batteries for industrial, commercial and personal use.
Manufacturer's Name and Address: Discover Energy Corp. / Univision Suite 880 – 999 West Broadway Vancouver BC V5Z 1K5 Canada Telephone: 1.604.730.2877	**Emergency Telephone Number:** US: INFOTRAC 1.800.535.5053 CN: CHEMTREC 1.800.424.9300

SECTION 2: HAZARD(S) IDENTIFICATION

GHS CLASSIFICATION		
HEALTH	**ENVIRONMENTAL**	**PHYSICAL**
Acute Toxicity - Not Listed (NL)	Aquatic Toxicity (NL)	NFPA (NL)
Eye Corrosion (NL)		CN (NL)
Skin Corrosion (NL)		EU (NL)
Skin Sensitization (NL)		
Mutagenicity / Carcinogenicity (NL)		
Reproductive / Developmental (NL)		
Target Organ Toxicity [Repeated] (NL)		

Hazard Statements	Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin.	
Precautionary Statements	Keep out of reach of children. Keep containers tightly closed. Avoid heat, sparks, and open flame while charging batteries. Avoid contact with internal acid / gel.	
Emergency Overview	May form explosive air/gas mixture during charging. Contact with internal components may cause irritation of severe burns. Irritating to eyes, respiratory system, and skin. Prolonged inhalation or ingestion may result in serious damage to health. Pregnant women exposed to internal components may experience reproductive/developmental effects.	
Potential Health Effects	Eyes	Direct contact of internal electrolyte gel with eyes may cause severe burns or blindness.
	Skin	Direct contact of internal electrolyte gel with the skin may cause skin irritation or damaging burns.
	Ingestion	Swallowing this product may cause severe burns to the esophagus and digestive tract and harmful or fatal lead poisoning. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints.
	Inhalation	Respiratory tract irritation and possible long term effects.

Acute Health Hazards	Repeated or prolonged contact may cause mild skin irritation.
Chronic Health Hazards	Lead poisoning if persons are exposed to internal components of the batteries. Lead absorption may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints. Other effects may include central nervous system damage, kidney dysfunction, and potential reproductive effects. Chronic inhalation of sulfuric acid mist may increase the risk of lung cancer.
Medical Conditions Generally Aggravated By Exposure	Respiratory and skin diseases may predispose one to acute and chronic effects of sulfuric acid and/or lead. Children and pregnant women must be protected from lead exposure. Persons with kidney disease may be at increased risk of kidney failure.
Additional Information	No health effects are expected related to normal use of this product as sold.

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SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS (chemical/common names)	**CAS NUMBER:**	**% by WEIGHT:**	**EV NUMBER:**
Lead, inorganic	7439-92-1	60 - 80	231-100-4
Sulfuric acid	7664-93-9	5-15	231-639-5
Antimony	7440-36- 0	0-0.1	231-146-5
Arsenic	7440-38-2	<0.1	231-148-6
Tin	7440-31-5	0-0.1	231-141-8
Polypropylene	9003-07-0	2-10	N/A
Acrylonitrile Butadiene Styrene (ABS)	9003-56-0	4-12	N/A
Additional Information	These ingredients reflect components of the finished product related to performance of the product as distributed into commerce.		

SECTION 4: FIRST AID MEASURES

Eye Contact	Flush eyes with large amounts of water for at least 15 minutes. Seek immediate medical attention if eyes have been exposed directly to acid gel.
Skin Contact	Flush affected area(s) with large amounts of water using deluge emergency shower, if available, shower for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.
Ingestion	If swallowed, give large amounts of water. Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death.
Inhalation	If breathing difficulties develop, remove person to fresh air. If symptoms persist, seek medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Suitable/unsuitable extinguishing media	Dry chemical, carbon dioxide, water, foam. Do not use water on live electrical circuits.
Special fire fighting procedures & protective equipment	Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells. Avoid breathing vapours. Use full protective equipment (bunker gear) and self-contained breathing apparatus.
Unusual fire and explosion hazards	Batteries evolve flammable hydrogen gas during charging and may increase fire risk in poorly ventilated areas near sparks excessive heat or open flames.
Specific hazards in case of fire	Thermal shock may cause battery case to crack open. Containers may explode when heated.
Additional Information	Firefighting water runoff and dilution water may be toxic and corrosive. May cause adverse environmental impacts.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions	Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.
Environmental precautions	Prevent spilled material from entering sewers and waterways.
Spill containment & cleanup Methods/materials	Add neutralizer/absorbent to spill area. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.
Additional Information	Lead acid batteries and their plastic cases are recyclable. Contact a Discover representative for recycling info.

SECTION 7: HANDLING & STORAGE

Precautions for safe handling/storage	• Keep containers tightly closed when not in use. • If battery case is broken, avoid contact with internal components. • Do not handle near heat, sparks, or open flames. • Protect containers from physical damage to avoid leaks and spills. • Place cardboard between layers of stacked batteries to avoid damage and short circuits. • Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire. • Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

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SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls/system design	Charge in areas with adequate ventilation.
Ventilation	General dilution ventilation is acceptable.
Respiratory protection	Not required for normal condition use. See special firefighting procedures (Section 5)
Eye protection	Wear protective glasses with side shields or goggles.
Skin protection	Wear chemical resistant gloves as a standard procedure to prevent skin contact.
Other protective clothing or equipment	None required under normal use conditions for EV Traction Dry Cell, and Gel Absorbed Electrolyte Sealed, Valve Regulated Battery. Wash hands after handling.

EXPOSURE GUIDELINES & LIMITS			
OSSA	Permissible Exposure Limit (PEL/TWA)	Lead, inorganic (as Pb)	0.05 mg/m^3
		Sulfuric acid	1 mg/m^3
		Antimony	0.5 mg/m^3
		Arsenic	mg/m^3
		Tin	2 mg/m^3
ACGIH	2007 Threshold Limit Value (TLV)	Lead, inorganic (as Pb)	0.05 mg/m^3
		Sulfuric acid	0.2 mg/m^3
		Antimony	0.5 mg/m^3
		Arsenic	0.01mg/m^3
		Tin	2 mg/m^3
Quebec	Permissible Exposure Value (PEV)	Lead, inorganic (as Pb)	0.15 mg/m^3
		Sulfuric acid	1 mg/m^3 TWA
			3 mg/m^3 STEV
		Antimony	0.5 mg/m^3
		Arsenic	0.1 mg/m^3
		Tin	2 mg/m^3
Ontario	Occupational Exposure Level (OEL)	Lead (designated substance)	0.10 mg/m^3
		Sulfuric acid	1 mg/m^3 TWAEV
			3 mg/m^3 STEV
		Antimony	0.5 mg/m^3
		Arsenic (designated substance)	0.01 mg/m^3
		Tin	2 mg/m^3
Netherlands	Maximaal Aanvaarde Concentratie (MAC)	Lead, inorganic (as Pb)	0.15 mg/m^3
		Sulfuric acid	1 mg/m^3
Germany	Maximale Arbeitsplatzkonzentrationen (MAK)	Lead, inorganic (as Pb)	0.1 mg/m^3
		Sulfuric acid	1 mg/m^3 TWA
			2 mg/m^3 STEL
		Antimony	0.5 mg/m^3
United Kingdom	Occupational Exposure Standard (OES)	Lead	0.15 mg/m^3
		Antimony	0.5 mg/m^3
		Arsenic	0.1 mg/m^3
		Tin	2 mg/m^3
TWA: 8 Hour Time Weighted Average | STE: Short Term Exposure | mg/m^3: milligrams per cubic meter of air | NE: Not Established			
Additional Information	Batteries are housed in cases which are regulated as total dust or respirable dust only when they are ground up during recycling. May be required to meet Domestic Requirements for a Specific Destination(s).		

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Industrial/commercial lead acid gel battery		
Odor	Odorless		
Odor threshold	N/A		
Physical state	Sulfuric Acid, Gelatinous/ Lead, solid		
PH	<1		
Boiling point	235-240° F (as sulfuric acid)		
Melting point	N/A		
Freezing point	N/A		
Vapor pressure	10 mmHg		
Vapor density (air = 1)	> 1		
Specific gravity (h2o = 1)	1.27–1.33		
Evaporation rate (n-buac=1)	< 1		
Solubility in water	100% (as sulfuric acid)		
Flash point	Below room temperature (as hydrogen gas)		
Auto-ignition temperature	N/A		
Lower explosive limit (lel)	4% (as hydrogen gas)		
Upper explosive limit (uel)	74% (as hydrogen gas)		
Partition coefficient	N/A		
Viscosity (poise @ 25° c)	N/A		
Decomposition temperature	N/A		
Flammability/HMIS Hazard Classification (US/CN/EU)	As Sulfuric Acid		
	Health: 3	Flammability: 0	Reactivity: 2

SECTION 10: STABILITY & REACTIVITY

Stability	Industrial/commercial lead acid gel battery.
Incompatibility (Materials to avoid)	Strong bases, combustible organic materials, reducing agents, finely divided metals, strong oxidizers, and water.
Hazardous decomposition / by-products	Thermal decomposition will product sulfur dioxide, sulfur trioxide, carbon monoxide, sulfuric acid mist, and hydrogen.
Hazardous polymerization	Will not occur.
Conditions to avoid	Overcharging, sources of ignition.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (test results basis & comments)	
Sulfuric acid	LD_{50} , Rat: 21409 mg/kg
	LC_{50}, Guinea pig: 510 mg/m^3
Lead	Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report that abnormal conduction velocities in person with blood lead levels of 50 µg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.
Additional information	Very little chronic toxicity data available for elemental lead. Lead is listed by IARC as a 2B carcinogen: possible carcinogen in humans. Arsenic is listed by IARC, ACGIH, and NTP as a carcinogen, based on studies with high doses over long periods of time. The other ingredients in this product, present at equal to or greater than 0.1% of the product, are not listed by OSHA, NTP, or IARC as suspect carcinogens. 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 12: ECOLOGICAL INFORMATION

Persistence & degradability	Lead is very persistent in soils / sediments. No data available on biodegradation.
Bio-accumulative potential (inc. mobility)	Mobility of metallic lead between ecological compartments is low. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants, but very little bioaccumulation occurs through the food chain. Most studies have included lead compounds, not solid inorganic lead.
Aquatic toxicity (test results & comments)	Sulfuric acid: 24-hour LC50, fresh water fish (Brachydanio rerio): 82 mg/l 96-hour LOEC*, fresh water fish (Cyprinus carpio): 22 mg/l
	Lead (metal): No data available
*lowest observable effect concentration	

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SECTION 13: DISPOSAL CONSIDERATIONS

Waste disposal method	Lead acid batteries are recyclable when sent to a secondary lead smelter. Follow local, State / Provincial, and Federal / National regulations applicable to as-used, end-of-life characteristics to be determined by end-user.
Hazardous waste class / code	US - Not applicable to finished product as manufactured for distribution into commerce. CN - Not applicable to finished product as manufactured for distribution into commerce. EWC - Not applicable to finished product as manufactured for distribution into commerce.
Additional information	Not Included. Recycle or dispose as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

GROUND: US-DOT / CAN-TDG / EU-ADR / APEC-ADR Proper Shipping Name	Not regulated as a Hazardous Material
AIRCRAFT: ICAO-IATA Proper Shipping Name	Not regulated as a Hazardous Materials Discover Batteries meet the test requirements for "Non-Spillable and wet electronic storage Batteries" as provided in 49 CFR 173.159 (d) and IATA/ICAO, and are non-regulated when protected against short circuits, kept upright, and securely packaged.
VESSEL: IMO-IMDG Proper Shipping Name	Not regulated as a Hazardous Material
Additional information	Each battery and the outer packaging must be plainly and durably marked "Nonspillable" or "Nonspillable Battery" Non-Spillable Battery complies with the provisions listed in 49 CFR 173.159(d), therefore must not be marked with an identification number or hazardous label and is not subject to hazardous shipping paper requirements. Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS (All components are listed on the TSCA; EINECS / ELINCS; and DSL, unless noted otherwise below)

US FEDERAL REGULATIONS		
TSCA Section 8b - Inventory Status	All chemicals comprising this product are either exempt or listed on the TSCA Inventory.	
TSCA Section 12b - Export Notification	If the finished product contains chemicals subject to TSCA Section 12b export notification, they are listed below:	
	Chemical	CAS#
	None	N/A

CERCLA (Comprehensive Responsive Compensation and Liability Act)		
	Chemicals present in the product which could require reporting under the statute:	
	Chemical	CAS#
	Lead	7439-92-1
	Sulfuric acid	7664-93-9

SARA TITLE III (Superfund Amendments and Reauthorization Act)			
	The finished product contains chemicals subject to the reporting requirements of Section 313 of SARA TITLE III.		
	Chemical	CAS#	%wt
	Lead	7439-92-1	67
	Sulfuric acid	7664-93-9	10

CERCLA Section 311/312 Hazard Categories		
	The finished product is exempt from these regulations, but lead and sulfuric acid above the thresholds are reportable on Tier II reports.	
	Fire Hazard	No
	Pressure Hazard	No
	Reactivity Hazard	No
	Immediate Hazard	No (internal acid gel is corrosive)
	Delayed Hazard	No
	Sulfuric acid is regulated as an EHS (Extremely Hazardous Substance)	

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US STATE REGULATIONS			
California Proposition 65	The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects or other reproductive harm:		
	Chemical	CAS#	%wt
	Arsenic (as arsenic oxides)	7440-38-2	<0.1
	Strong inorganic acid mists (including sulfuric acid)	N/A	10
	Lead	7439-92-1	67
California Consumer Product Volatile Organic Compound Emissions	This product is not regulated as a Consumer Product for purposes of CARB / OTC VOC Regulations, as sold for the intended purpose and into the industrial / commercial supply chain.		

INTERNATIONAL REGULATIONS (Non-US)			
Canadian Domestic Substance List (DSL)	All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.		
WHMIS Classifications	Class E: Corrosive materials present at greater than 1%. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Controlled Products Regulations.		
NPRI and Ontario Regulation 127/01	This product contains the following chemicals subject to the reporting requirements of Canada NPRI +/or Ont. Reg.127/01:		
	Chemical	CAS#	%wt
	Lead	7439-92-1	67
	Sulfuric acid	7664-93-9	10
European Inventory of Existing Commercial Chemical Substances (EINECS)	All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.		
European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC	R-PHRASES	S-PHRASES	
	35, 36, 38	1/2, 26, 30, 45	

ADDITIONAL INFORMATION	This product may be subject to Restriction of Hazardous Substances (RoHS) regulations in Europe and China, or may be regulated under additional regulations and laws not identified above, such as for uses other than described or as designed / as-intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION

Other information	Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2). Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.
Sources of information	International Agency for Research on Cancer (1987), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France. Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents.
RTECS - Registry of Toxic Effects of Chemical Substances, National institute for Occupational Safety and Health.	Enersys Manufacturing, Deutsche Exide GmbH, C&D Technologies, Exide Technologies, East Penn Manufacturing, Governments and regulatory publications available from the Government of the USA, Canada and EU.

MSDS/SDS PREPARATION INFORMATION	
Date of issue:	October 2, 2012 / Supersedes all previous versions
Disclaimer:	This Material Safety Data Sheet is based upon information and sources available at the time of preparation or revision date. The information in the MSDS was obtained from sources which we believe are reliable, but are beyond our direct supervision or control. We make no Warranty of Merchantability, Fitness for any particular purpose, or any other Warranty, Expressed or Implied, with respect to such information, and we assume no liability resulting from its use. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use of, or disposal of the product. It is the obligation of each user of the product to determine the suitability of this product and comply with the requirements of all applicable laws regarding use and disposal of this product. For additional information concerning Discover Energy Corp. products or questions concerning the content of this MSDS, please contact your Discover Representative.