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MATERIAL SAFETY DATA SHEET

Air Exposure Limits (ug/m³)

I. PRODUCT IDENTIFICATION

Chemical Trade Name (as used on label):

Lead-Acid Battery

Manufacturer's Name/Address: Hawker

P.O. Box 808

9404 Ooltewah Industrial Drive

Ooltewah, TN 37363

II. HAZARDOUS INGREDIENTS/IDENTIFY INFORMATION

Chemical Family/Classification:

- Electric Storage Battery Telephone:

For information and emergencies, contact Hawker's Environmental, Health & Safety Dept. at 423-238-5700 ATTN: Craig Allison

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24-Hour Emergency Response Contact:

CHEMTREC DOMESTIC: 800-424-9300 CHEMTREC INTL: 703-527-3887

					Air Exposure Limit	s (ug/m [*])
Component	S	CAS Number	Approximate % by Wt. Or	OSHA	ACGIH	NIOSH
-			Vol.			
Inorganic I	Lead Compound:					
mor game 1	Lead	7439-92-1	60	50	150	100
	* Antimony	7440-36-0	2	500	500	
	* Arsenic	7440-38-2	0.2	10	200	
	* Calcium	7440-38-2	0.2			
	* Tin	7440-31-5	0.2	2000	2000	
,	(Sulfuric Acid)	7664-93-9	10-30	1000	1000	1000
Case Mater			5-10	N/A	N/A	N/A
	Polypropylene	9003-07-0				
	Polystyrene	9003-53-6				
	Styrene Acrylonitrile	9003-54-7				
	Acrylonitrile Butadiene Styrene	9003-56-9				
	Styrene Butadiene	9003-55-8				
	Polyvinylchloride	9002-86-2				
	Polycarbonate, Hard Rubber, Polyethylene					
Other:						
	Silicon Dioxide (Gel batteries only)	7631-86-9	20-40	N/A	N/A	N/A
1	Sheet Molding Compound		2010	N/A	N/A	N/A
	(Glass reinforced polyester)			11/17	11/17	11/17
	Inorganic lead and electrolyte (sulfuric acid) are the p	rimary components of avary bette	ary manufactured by Hawker		1	
				tion		
III DINIO	Other ingredients may be present dependent upon bat	tery type. Contact your Hawker r	epresentative for additional information	uon.		
	ICAL DATA					
Electrolyte						
	Boiling Point:	203 - 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	
1	Evaporation Rate: (Butyl Acetate = 1)	Less than 1	% Volatile by Weight:		N/A	
	Appearance and Odor:	Manufactured article; no	o apparent odor. Electrolyte is a cle	ar liquid with a	a sharp, penetrating, pu	ingent odor.
IN EIDE	AND EXPLOSION HAZARD DATA					
IV. FIKE A	: N/A	Flammable Limits: LE	L = 4.1% (Hydrogen Gas)		UEL = 74.2%	
IV. FIKE A						
Flash Point	g Media: CO2; foam; dry chemical					
Flash Point Extiguishin						
Flash Point Extiguishin	e Fighting Procedures:	ve pressure self-contained breath	ing apparatus. Water applied to ele	ctrolyte genera	ites	
Flash Point Extiguishin	Fighting Procedures: If batteries are on charge, shut off power. Use positi		ing apparatus. Water applied to ele	ctrolyte genera	ıtes	
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C H	AWKER MATERIAL SAFETY DATA SHEET	Form # 853020H Revised: 09/30/11 Supersedes: 07/26/11
Effects of O	verexposure - Acute:	ECO # 1001061
	Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation. <u>Lead Compounds:</u> Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetitie, muscular aches and weakness, sleep disturbances and irritability.	
Effects of O	verexposure - Chronic: <u>Sulfuric Acid</u> : Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes. <u>Lead Compounds</u> : Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females.	
Carcinogeni	city: Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. 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 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 Cor	idtions Generally Aggravated by Exposure:	
	Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmunary 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.	
	EMERGENCY AND FIRST AID PROCEDURES:	
Inhalation:		
Ingostion	<u>Sulfuric Acid:</u> Remove to fresh air immediately. If breathing is difficult, give oxygen. <u>Lead:</u> Remove from exposure, gargle, wash nose and lips; consult physician.	
Ingestion:	<u>Sulfuric Acid:</u> Give large quanitities of water; do not induce vomiting; consult physician. <u>Lead:</u> Consult physician immediately.	
<u>Skin:</u>	Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes. Lead: Wash immediately with soap and water.	
Eyes:	Sulfuric Acid and Lead: Flush immediately with large amounts of water for a least 15 minutes; consult physician.	
Proposition	<u>Warning:</u> 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. AUTIONS FOR SAFE HANDLING AND USE	
Spill or Leal	<u>x Procedures:</u> 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 unneutralized acid to sewer.	
Waste Dispo	sal Methods: <u>Spent batteries</u> : Send to secondary lead smelter for recycling. 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.	
VII. PRECA	AUTIONS FOR SAFE HANDLING AND USE (Cont.)	
Handling an	d 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. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat. Precautionary Labeling:	
	POISON - CAUSES SEVERE BURNS DANGER - CONTAINS SULFURIC ACID	
VIII. CON Engineering	Controls: Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.	
Work Pract	ces: Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing when filling or handling batteries.	
Respiratory		
Protective G	loves: Rubber or plastic acid-resistant gloves with elbow-length gauntlet.	
Eye Protecti	Chemical goggles or face shield.	
Other Prote Emergency	Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots.	
gency	In areas where sulfuric acid is handled in concentrations greater then 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.	

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	AWKER	MATE	CRIAL SAFETY DAT	A SHEET	Form # 853020H Revised: 09/30/11 Supersedes: 07/26/11 ECO # 1001061		
	R REGULATORY INFORMA	TION					
FPA Haza	rd Rating for Sulfuric Acid:						
	Flammability (Red) = 0 Health (Plue) = 2			Reactivity (Yellow) $= 2$			
S. DOT:	Health (Blue) $= 3$			Sulfuric acid is water-reactive if concentrated.			
<u></u>	through the Code of Federal H	5	These regulations classify the	United States is regulated by the U.S. DOT se types of batteries as a hazardous material. t batteries.			
	Haz	<u>as follows:</u> pper Shipping Name: Batteries, v zardous Class: 8 I Indentification: UN2794	wet, filled with acid	Packing Group Label/Placard F	: III Required: Corrosive		
	Contact your Hawker represe	ntative for additional informatio	n regarding the classification	of batteries.			
<u>TA:</u>		lso classify these types of batterie		ted by the International Air Transport Association the batteries must be packed according to	ion		
	Haz	<u>us follows:</u> oper Shipping Name: Batteries, v zardous Class: 8 I Indentification: UN2794	wet, filled with acid	Packing Group Label/Placard F	: III Required: Corrosive		
	Contact your Hawker represe	ntative for additional informatio	n regarding the classification	of batteries.			
<u>IDG:</u>	Goods code (IMDG). These I IMDG Packing instructions P The shipping information is a Pro	regulations also classify these types the set of the se	pes of batteries as hazardous	ed by the International Maritime Dangerous material. The batteries must be packed accord Packing Group Label/Placard F			
		Indentification: UN2794			conside		
		ntative for additional informatio	n regarding the classification	of batteries.			
	R REGULATORY INFORMA	TION (Cont.)					
CRA:	Spant lead acid batteries are a	not regulated as hazardous waste	by the EPA when recycled	nowever state and international regulations may	7 V9 F V		
<u>ERCLA (</u>	Right to Know Act) is <u>1,0001</u> (b) Sulfuric acid is a listed "F (c) EPCRA Section 302 notif	bs. State and local reportable question of the state of t	uantities for spilled sulfuric a ' under EPCRA, with a Thres or more of sulfuric acid is pre	and EPCRA (Energency Planning Community cid may vary. hold Planning Quantity (TPQ) of <u>1.000 lbs</u> . sent at one site. The quantity of sulfuric acid			
	(d) EPCRA Section 312 Tier present in quantities of 10,000	type. Contact your Hawker representative for additional information. n 312 Tier 2 reporting is required for batteries if sulfuric acid is present in quantities of 500 lbs. or more and/or if lead is s of 10,000 lbs. or more.					
	 (e) <u>Supplier Notification</u>: 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:						
		Toxic Chemical	CAS Number	Approximate % by Wt.			
		Lead	7439-92-1	60			
		Sulfuric Acid	7664-93-9	10 - 30			
		* Antimony	7440-36-0	2			
		* Arsenic	7440-38-2	0.2			
	If you distribute this product of each calendar year.			mation must be provided with the first shipmer	nt		
C.A.		ification requirement does not ap ypes. Contact your Hawker repre		•			
<u>CA:</u>	Ingredients in Hawker's batter	ries are listed in the TSCA Regis	stry as follows:				
	Electrolyte:	<u>Components</u> Sulfuric Acid (H ₂ SO ₄)	<u>CAS Number</u> 7664-93-9	TSCA Status Listed			
	Inorganic Lead Compound:	Lead (Pb)	7439-92-1	Listed			
		Lead Oxide (PbO)	1317-36-8	Listed			
		Land Calfete (DECO)	7446-14-2	Listed			
		Lead Sulfate (PbSO ₄)		Listed			
		Antimony Sb)	7440-36-0				
		Antimony Sb) Arsenic (As)	7440-38-2	Listed			
		Antimony Sb) Arsenic (As) Calcium (Ca)	7440-38-2 7440-70-2	Listed Listed			
<u>A:</u>		Antimony Sb) Arsenic (As)	7440-38-2	Listed			
<u>AA:</u>		Antimony Sb) Arsenic (As) Calcium (Ca) Tin (Sn) e actions concerning ozone deple	7440-38-2 7440-70-2 7440-31-5 etion in the atmosphere due to	Listed Listed			