

Potential Commodities And Material Safety Data Sheets

- The commodity list is comprised of materials that may be shipped thru the facility.
- The Material Safety Data Sheet outlines the safety precautions and the applicable federal regulations governing the handling and shipment of each material.

	Commodity	Health Rating	Fire Rating	Reactivity Rating	Special Hazard Rating
1	Animal Feed (BIOFOS Additive)	2	0	0	-
2	Basic Chemicals (Melamine)	2	1	0	
3	Bauxite*	1	0	0	-
4	Bituminous Coal	1	1	0	-
5	Borax	1	0	0	-
6	Cereal Grains (Ground Corn)	1	1	0	-
7	Copper Concentrate	1	2	0	-
8	Dried Distillers Grain	1	1	0	-
9	Fertilizer (Mosaic MicroEssentials SZ)	2	0	0	-
10	Fuel Oils	2	2	0	-
11	Gasoline	1	3	0	-
12	Iron Ore	1	0	0	-
13	Logs (Douglas Fir)	1	0	0	-
14	Metallic Ores (Zinc Ore)	1	1	0	Water Reactive
15	Muriate of Potash	1	0	0	-
16	Portland Cement*	1	0	0	-
17	Soda Ash	2	0	0	-
18	Sodium Sulfate	2	0	0	-
19	Soybean (Meal)	0	0	0	-
20	Waste/Scrap (Aluminum)	1	0	0	-

**Information culled from different sources*



SECTION 1		PRODUCT AND COMPANY INFORMATION				
TRADE NAME:	BIOFOS [®]					
CHEMICAL NAME:	Monocalcium Phosphate					
CAS NUMBER:	CAS No. 7758-23-8					
CHEMICAL FAMILY:	Inorganic Salt					
SYNONYMS:	MCP, Calcium Phosphate Monobasic, Monocalcium Phosphate, Monocalcium Diphosphate, Monocalcium Phosphate, Calcium bis(dihydrogen phosphate)					
PRIMARY USE:	Animal Feed ingredient.					
COMPANY INFORMATION:	<p style="text-align: center;">The Mosaic Company Atria Corporate Center 3033 Campus Drive, Suite E490 Plymouth, MN 55441USA www.mosaicco.com</p> <p style="text-align: center;">For non-emergency questions, phone hours are 8 AM to 5 PM Central Time US 800.918.8270 (toll free) 763.577.2700 (phone)</p>					
EMERGENCY TELEPHONE:	<p style="text-align: center;">EMERGENCY OVERVIEW 24 Hour Emergency Telephone Number: For Chemical Emergencies: Spill, Leak, Fire or Accident Call CHEMTREC North America: (800) 424-9300 (reference CCN201871) Others: (703) 527-3887 (collect)</p>					
SECTION 2		HAZARD IDENTIFICATION				
EMERGENCY OVERVIEW :	Health Hazards:	Severe irritant. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Monocalcium phosphate and dicalcium phosphate are generally recognized as safe (GRAS) when used in accordance with good manufacturing practice and when used as intended.				
	Physical Hazards:	Slippery when wet.				
	Physical Form:	Solid granules.				
	Appearance:	Light gray granules.				
	Odor:	Slight.				
	Toxicity:	None expected under normal use.				
	NFPA HAZARD CLASS		HMIS HAZARD CLASS		WHMIS HAZARD CLASS	
	Health:	2	Health:	2	Symbol	N/A
	Flammability:	0	Flammability:	0	Classification	Not WHMIS controlled
	Instability:	0	Physical Hazard:	0	Sub Class (N/A)	
Special Hazard:	None	PPE:	Section 8			

POTENTIAL HEALTH EFFECTS:	Eye:	Continuous contact may cause severe eye irritation, eye burns, and permanent eye damage.
	Skin:	Contact may cause mild irritation including redness and a burning sensation. Studies by other exposure routes suggest a low degree of hazard by skin absorption.
	Inhalation (Breathing):	No information available. Studies by other exposure routes suggest a low degree of hazard by inhalation.
	Ingestion (Swallowing)	Low degree of toxicity by ingestion.
	Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, and diarrhea.
	Cancer:	No data available.
	Target Organs:	No data available.
	Developmental:	No data available.
	Other Comments:	<p>This material contains iron compound(s). Chronic exposure to high concentrations of iron has been associated with hemosiderosis, hemochromatosis and in severe cases, liver cirrhosis. Typical occupational exposures to iron compounds are not expected to cause these effects. Chronic inhalation can produce "mottling" of the lungs (siderosis). This is considered a benign pneumoconiosis and does not normally lead to fibrosis or cause significant physiologic impairment.</p> <p>Inorganic phosphates have been studied extensively due to their use as food additives. The JECFA (Joint FAO/WHO expert committee on food additives) determined that the acceptable dietary intake for humans would be 0 to 70 mg/kg. These doses and route of exposure are not considered relevant to occupational settings.</p>
	Pre-Existing Medical Conditions:	None known.
POTENTIAL ENVIRONMENTAL EFFECTS:	May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen (This comment directed primarily to fresh and coastal water systems).	
SECTION 3		COMPOSITION INFORMATION ON INGREDIENTS
FORMULA:	Ca(H ₂ PO ₄) ₂ ·H ₂ O + CaHPO ₄ ·2H ₂ O	
COMPOSITION:	Monocalcium Phosphate (MCP) CAS No. 7758-23-8	53-60% (80.5% of P derived from MCP)
	Dicalcium Phosphate (DCP) CAS No. 7757-93-9	11-19% (<19.5% of P derived from DCP)



	Calcium Carbonate and other Carbonates CAS No. (NA)	6-8%
	Iron, Aluminum, Magnesium, Sodium, and Potassium Compounds CAS No. (NA)	8-13%
	Calcium Sulfate and other Sulfates CAS No. (NA)	2-3%
SECTION 4	FIRST AID MEASURES	
FIRST AID PROCEDURES:	Eyes:	Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 30 minutes. Seek immediate medical attention.
	Skin:	Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.
	Inhaled:	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
	Ingestion:	If large amounts are swallowed, seek emergency medical attention. If possible, do not leave victim unattended and observe closely for adequacy of breathing.
NOTE TO PHYSICIAN:	None known.	
SECTION 5	FIRE FIGHTING MEASURES	
FLAMMABLE PROPERTIES:	Flash Point:	Not applicable – BIOFOS® is non-flammable
	OSHA Flammability Class:	Not applicable
	LEL/UEL:	LEL: / UEL: Not applicable
	Auto-Ignition Temperature:	Not applicable
EXTINGUISHING MEDIA:	Use extinguishing agent suitable for type of surrounding fire. Avoid excessive water to minimize runoff.	



PROTECTION OF FIREFIGHTERS:	Positive pressure, self-contained breathing apparatus is required for all fire fighting activities involving hazardous materials. Full structural fire fighting (bunker) gear is the minimum acceptable attire. The need for proximity, entry, flashover and/or special chemical protective clothing (see Section 8) needs to be determined for each incident by a competent fire fighting safety professional. Water used for fire suppression and cooling may become contaminated. Discharge to sewer system(s) or the environment may be restricted, requiring containment and proper disposal of water.	
SECTION 6	ACCIDENTAL RELEASE MEASURES	
RESPONSE TECHNIQUES:	<ul style="list-style-type: none"> BIOFOS® is a feed ingredient that is similar to crop nutrients and plant foods; however, large spills can harm or kill vegetation. Stay upwind and away from spill (dust hazard). Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Notify appropriate federal, state/provincial, and local agencies as may be required (see Section 15). Minimize dust generation. Sweep up and package appropriately for disposal. 	
RELEASE NOTES :	If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US COAST GUARD NATIONAL RESPONSE CENTER toll free number 800-424-8802. In case of accident or land transportation-related spill notify: CHEMTREC IN North America at 800-424-9300 and from other countries at (International code) +0-703-527-3887 (collect).	
SECTION 7	HANDLING AND STORAGE	
HANDLING:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.	
STORAGE:	Keep container(s) tightly closed. Use and store this material in cool, dry, well ventilated areas. Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage.	
SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION	
ENGINEERING CONTROLS:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Exposure Guidelines, below), additional ventilation or exhaust systems may be required.	
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended.
	Skin:	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption (see glove manufacturing literature for information on permeability).



	Respiratory:	Use a dust mask or other appropriate respiratory protection where engineering controls are not feasible or during operations that generate airborne concentrations exceeding the relevant standards.
	Other:	A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.
GENERAL HYGIENE CONSIDERATIONS:	Wash thoroughly after handling Wash contaminated clothing Use adequate ventilation Use good personal hygiene practice	
EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	Particulates Not Otherwise Regulated-PNOR: 5 mg/m ³ TWA (respirable) Calcium Sulfate/other Sulfates: 15 mg/m ³ TWA (total dust)
	ACGIH Threshold Limit Value (TLV):	Particulates Not Otherwise Specified – PNOS: 10 mg/m ³ TWA (total dust) Iron, Aluminum, Magnesium, Sodium and Potassium Phosphates: 1 mg/m ³ TWA
SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES	
Note: Unless otherwise stated, values in this section are determined at 20 °C (68 °F) and 760 mm Hg (1 atm).		
Flash Point:	Not applicable	
Flammability/ Explosive Limits (%):	LEL:/ UEL: Not applicable	
Auto-Ignition Temperature:	Not applicable	
Appearance:	Light gray granules	
Physical State:	Solid granules	
Odor:	Slight	
pH:	3.6 (in a 1% solution)	
Vapor Pressure (mm Hg):	Not applicable	
Vapor Density (air=1):	Not applicable	
Boiling Point:	Not applicable	
Freezing/Melting Point:	Not applicable	
Solubility in Water:	Moderately soluble; Cold water 1.8 g/100 cc @ 30 °C; decomposes in hot water.	
Specific Gravity:	2.22 @ 18 °C/4 °C	
Volatility:	Not applicable	
Bulk Density:	Loose 57 – 59 lbs/ft ³ (913– 945 kg/m ³)	



SECTION 10	STABILITY AND REACTIVITY
Chemical Stability:	Stable under normal conditions of storage and handling; decomposes at approx. 200 °C.
Conditions to Avoid:	None known.
Incompatible Materials:	None known.
Hazardous Decomposition Products:	Combustion can yield oxides of sulfur when heated above 1000 °F (538 °C).
Corrosiveness:	No data.
Hazardous Polymerization:	Will not occur.
SECTION 11	TOXICOLOGICAL INFORMATION
Acute Oral Toxicity	See Section 15 under Food and Drug Administration (FDA) notes
Acute Inhalation Toxicity	No definitive information available for this product
Acute Dermal Toxicity	No definitive information available for this product
Mutagenesis	No definitive information available for this product
Target Organ	No definitive information available for this product
Developmental Toxicity	No definitive information available for this product
Carcinogenicity	At the time of the IARC Working Group on the Evaluation of Carcinogenic Risks to Humans, 2006, no data were available to assess the carcinogenic potential of this agent.
SECTION 12	ECOLOGICAL INFORMATION
ECOTOXICOLOGY:	May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen (primarily fresh and coastal water systems). At extremely high concentrations, this may be hazardous to fish or other marine organisms. Release to watercourses may cause effects downstream.
SECTION 13	DISPOSAL CONSIDERATIONS
	This material, if discarded as produced, is not a RCRA “listed” or “characteristic” hazardous waste (U.S. EPA). Contamination may change the characterization and subject it to hazardous waste regulations. Properly characterize all waste materials to plan for proper disposal. Consult federal provincial/state and local regulations regarding the proper disposal of this material.
SECTION 14	TRANSPORTATION INFORMATION
Regulatory Status	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) Regulations Canada.



Proper Shipping Name	Not applicable
Hazard Class	Not applicable
Packing Group	Not applicable
Identification Number	Not applicable
Guide Number	Not applicable
MARPOL Annex II	Not applicable
MARPOL Annex V	<p>Based on the United Nations Globally Harmonized System for Classification and Labeling of Chemicals (UN GHS) this product is not harmful to the marine environment (non-HME) based on not exceeding the parameters or criteria below¹:</p> <ul style="list-style-type: none"> Acute Aquatic Toxicity Category 1; and/or Chronic Aquatic Toxicity Category 1 or 2; and/or Carcinogenicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or Mutagenicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or Reproductive Toxicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or Specific Target Organ Toxicity Repeated Exposure² Category 1 combined with not being rapidly degradable and having high bioaccumulation; and/or Solid bulk cargoes containing or consisting of synthetic polymers, rubber, plastics, or plastic feedstock pellets (this includes materials that are shredded, milled, chopped or macerated or similar materials). <p>Notes: 1) The criteria are based on UN GHS, fourth revised edition (2011). For specific products (e.g. metals and inorganic metal compounds) guidance available in UN GHS, annexes 9 and 10 are essential for proper interpretation of the criteria and classification and should be followed. 2) Products that are classified for Carcinogenicity, Mutagenicity, reproductive toxicity or Specific Target Organ Toxicity Repeated Exposure for oral and dermal hazards or without specification of the exposure route in the hazard statement.</p>
SECTION 15	REGULATORY INFORMATION
FDA:	Phosphate compounds are Generally Recognized As Safe (GRAS) by the U.S. Food and Drug Administration (21 CFR 582.1141; Bhat and Ramaswamy 1993) which allows them to be used as food and color additives. Monobasic calcium phosphate used as a sequestrant in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice. [21 CFR 582.6215 (4/1/90)]. Calcium phosphate (mono-, di-, and tribasic) used as a general purpose food additive in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice.[21 CFR 582.1217 (4/1/90)]
CERCLA:	Product is not listed with an RQ (reportable quantity)

RCRA 261.33:	Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof are not listed as hazardous waste
SARA TITLE III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	<p>SARA – 311/312: Acute: Yes; Chronic: No; Fire: No; Pressure: No; Reactivity: No</p> <p>SARA – 313: Not Listed</p> <p>SARA – 302/304: Not Listed</p>
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL and NDSL:	This product is registered in Canada under the Feeds Act and is thus exempt from the New Substances Notification Requirements in the Canadian Environmental Protection Act (CEPA) per subsection 26(3).
TSCA:	All ingredients are listed in the TSCA Inventory or are exempt from listing.
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.
CBSA:	This product does not contain any bovine, ruminant or other animal by-products
CA Proposition 65: (Health & Safety Code Section 25249.5)	Warning: This product contains a chemical(s) known to the State of California to cause: cancer; and/or birth defects or other reproductive harm.
SECTION 16	OTHER INFORMATION
Disclaimer:	<p>The information in this document is believed to be correct as of the date issued. Nothing herein contained shall be deemed to be a representation or warranty with respect to the product described herein. NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE, AND ALL SUCH REPRESENTATIONS AND WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED BY MOSAIC. This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions and use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.</p>
Preparation:	The preparation of this MSDS was generally in accordance with ANSI Z400.1-2010.
Revision Date:	07/08/2013
Sections Revised:	1,2,3,6,7,8,15 and 16
MSDS Number:	MOS100068.02
References:	MARPOL Annex V; TOXNET, Merck Index, CRC Handbook 72 nd Edition



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An Axel Johnson, Inc. Company

MATERIAL SAFETY DATA SHEET

**BITUMINOUS
COAL**

Content Last Revised 1/94; 10/12/00;
07/26/02; 06/05
4 pages.

SECTION 1 - MATERIAL IDENTIFICATION		24 HOUR EMERGENCY INFORMATION	
PRODUCT / CHEMICAL NAME:	BITUMINOUS COAL	Sprague: 603-431-1000 Chemtrec: 800-424-9300	<p>HEALTH</p>
PRODUCT / CHEMICAL SYNONYMS:	WASHED COAL, CLEAN COAL, SOFT COAL	HMIS / NFPA HAZARD RATING	
CHEMICAL FAMILY / FORMULA:	ALIPHATIC AND AROMATIC HYDROCARBONS / VARIABLE	4=EXTREME 3=SERIOUS 2=MODERATE 1=SLIGHT 0=MINIMAL	
MATERIAL USE OR OCCURRENCE:	-		

SECTION 2 - INGREDIENTS & RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS			
COMPOSITION	% WEIGHT AS RECEIVED	OSHA PEL	ACGIH TLV
MOISTURE	(Typical) 1.0 - 10.0	None established.	None established.
ASH	4.0-20.0	15 mg/M ³ as nuisance dust less than 1% quartz	10 mg/M ³ as nuisance dust less than 1% quartz
TOTAL SULFUR	0.5-2.2	5.0 ppm as SO ₂	2.00 ppm as SO ₂
FIXED CARBON	50.0-72.0	None established	None established
VOLATILE MATTER* INCLUDING ELEMENTAL AND COMPOUNDS OF:	17.0-37.0		
HYDROGEN	4.8-5.3	None established	None established
NITROGEN	1.2-1.6	None established	None established
CHLORINE	.08-.19	1.0 ppm	1.0 ppm
COAL DUST		2.4 mg/ M ³ respirable fraction, < 5% SiO ₂ 10 mg/ M ³ > 5% SiO ₂ % SiO ₂₊₂	2 mg/M ³ respirable fraction, < 5% SiO ₂ 10 mg/ M ³ > 5% SiO ₂ % SiO ₂₊₂

SECTION 3 - PHYSICAL DATA			
IGNITION TEMPERATURE:	260°-365°F	% VOLATILITY BY VOLUME:	Negligible
MELTING POINT:	750° F	VAPOR DENSITY (AIR = 1):	N/A
AVERAGE SPECIFIC GRAVITY (H ₂ O = 1):	1.43	SOLUBILITY IN WATER:	Non-soluble
HETEROGENOUS - CARBONACEOUS			
APPEARANCE & ODOR: Irregular, rectangular-shaped chunks or particles, dense, grayish-black to black color with slight, minimal dank odor.			



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SECTION 4 - FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: When exposed to flame of temperatures in excess of 260° F.
EXTINGUISHING MEDIUM: Foam, carbon dioxide, dry chemical, halon, and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Use washdown and spread out method.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Susceptible to spontaneous combustion. Highly combustible and/or explosive when in dust or powder form.

SECTION 5 - HEALTH DATA		
TOXICOLOGICAL TEST DATA: Coal may liberate various polycyclic aromatic hydrocarbons (PAH's) upon thermal decomposition. There is no clear evidence that coal is carcinogenic to man or experimental animals because of their polycyclic aromatic hydrocarbon content. However, there is evidence that these PAH's may play an active role in the generation of lung cancer seen in cigarette smokers or tar-roofing workers.		
Coal may release small quantities of methane gas over a period of time. Progression of tuberculosis is greatly increased in pneumoconiosis but susceptibility is apparently not increased.		
	ACUTE HEALTH EFFECTS	CHRONIC HEALTH EFFECTS
INHALATION	The principal health hazard associated with coal occurs during its mining and transport. Coal workers' pneumoconiosis (CWP) can occur in miners after as little as 15 years of excessive inhalation of respirable coalmine dust. Respirable quartz particles and free silica may be co-implicated. Coal dust is deposited in the lungs where its site of action is the lung parenchyma, lymph nodes and hila. The severity of the disease is directly related to the amount of coal dust in the lungs. In the simple stages, the disease is detectable by x-ray as round, irregular "macules" of 1-5 mm. This stage typically does not change lung function or shorten life.	The chronic stage of CWP, however, involves massive pulmonary fibrosis that does impair pulmonary function and shorten life. Chronic Bronchitis (lung inflammation, coughing attacks, difficult breathing, etc.) and emphysema can result from excessive coal dust inhalation. Rheumatoid arthritis can be exacerbated by pneumonias leading to rapidly developing lung damage (Caplan's Syndrome).
INGESTION	May cause irritation.	No data available
SKIN CONTACT	May cause irritation.	No data available.
EYE CONTACT	Irritation of the eye.	No data available

FIRST AID



PROCEDURES

First aid procedures generally don't apply to this product. Maintain exposure to coal dust according to applicable regulatory standards.



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SECTION 6 - REACTIVITY DATA

STABILITY:	Stable if properly stored to inhibit oxidation.
HAZARDOUS POLYMERIZATION:	Hazardous polymerization has not been known to occur under normal temperatures and pressures. However, coal dust may react slowly with oxygen at room temperature. Heat accelerates the process, which could lead to spontaneous ignition in piles of coal dust.
CONDITIONS TO AVOID:	<ol style="list-style-type: none"> 1. Allowing coal to stand in water. 2. Storing coal on loose or porous ground. 3. Piling coal around upright steel or wooden posts, crane supports, underground drains, steam or hot water lines or areas where there is refuse such as wood, straw, growing vegetation or other organic material. 4. Storage in closed hampers, bins, receptacles, etc. without positive ventilation.
INCOMPATIBLES:	
TYPICAL DECOMPOSITION PRODUCTS:	May liberate hydrogen, methane, carbon monoxide, oxides of sulfur and hydrogen, coal tar pitch volatiles upon thermal decomposition.

SECTION 7 - SPECIAL PROTECTION

RESPIRATORY PROTECTION:	Use with adequate ventilation.	
VENTILATION	LOCAL EXHAUST:	MSHA/NIOSH approved dust respirator. Appropriate respirator depends upon type and magnitude of exposure.
	MECHANICAL (General):	Recommended for use in enclosed or semi-enclosed work areas.
EYE PROTECTION:	Splash goggles or shields with safety glasses	
PROTECTIVE GLOVES:	Neoprene, PVC	
OTHER PROTECTIVE CLOTHING OR EQUIPMENT:	Employee must wear appropriate impervious clothing and equipment to prevent repeated or prolonged skin contact with this substance.	

SECTION 8 - SPECIAL PRECAUTIONS

PRECAUTIONS FOR SAFE HANDLING & STORAGE:	Do not permit accumulation of dust or spillage. See also conditions to avoid, above.
SPILL AND LEAK PROCEDURES:	Cleanup by excavation, vacuum collection or washdown.
WASTE DISPOSAL METHOD:	<ol style="list-style-type: none"> 1. Incinerate in combustion device or system. 2. Dispose in approved, regulated landfill.

SECTION 9 - DOT HAZARDOUS MATERIAL INFORMATION

PROPER SHIPPING NAME: BITUMINOUS COAL	REQUIRED PLACARDING: NONE	
HAZARD CLASS: Non-Hazardous	PACKING GROUP (P.G.): III	N.A./U.N. NUMBER: NONE



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SECTION 10 - EPA SARA TITLE III INFORMATION

SECTION 311/312	ACUTE: N/A	CHRONIC: N/A	
HAZARD CLASSIFICATION: Non-Hazardous	FIRE: N/A	PRESSURE: N/A	REACTIVE: N/A

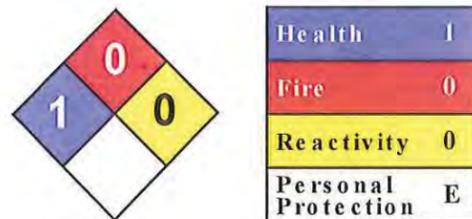
SECTION 11 - REMARKS

This material contains fused polycyclic hydrocarbons. The OSHA interpretation of coal tar pitch volatiles (Section 1910, 1002) is as follows: "Coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum, wood, and other organic matter." The OSHA PEL and ACGIH TLV for coal tar pitch volatiles is 0.2 mg/M³ (basis one soluble fraction).

SECTION 12 - ADDITIONAL REGULATORY DATA

REPORTABLE COMPONENTS: FEDERAL EPA	%	SARA RQ	CERCLA RQ	RCRA NO.
BITUMINOUS COAL	100	----	----	----

NOTE: OSHA Regulations 29 CFR 1910.1200 (Hazard Communication) do not consider coal as a "hazardous material" and a Material Safety Data Sheet (MSDS) is not required. The information contained herein is based on data available at this time and is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Since information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar, no responsibility is assumed for the results of its use. The person receiving this information shall make his own determination of the suitability of the material for his particular purpose.



Material Safety Data Sheet

Sodium Borate (Borax, fused) MSDS

Section 1: Chemical Product and Company Identification

<p>Product Name: Sodium Borate (Borax, fused)</p> <p>Catalog Codes: SLS1144</p> <p>CAS#: 1330-43-4</p> <p>RTECS: ED4588000</p> <p>TSCA: TSCA 8(b) inventory: Sodium Borate (Borax, fused)</p> <p>Cl#: Not available.</p> <p>Synonym: Sodium Biborate; Fused Borax; Sodium Boron oxide; Sodium Tetraborate; Anhydrous Borax</p> <p>Chemical Name: Boric Acid Disodium Salt</p> <p>Chemical Formula: B4-O7.2Na or Na2-B4-O7</p>	<p>Contact Information:</p> <p>Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396</p> <p>US Sales: 1-800-901-7247 International Sales: 1-281-441-4400</p> <p>Order Online: ScienceLab.com</p> <p>CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300</p> <p>International CHEMTREC, call: 1-703-527-3887</p> <p>For non-emergency assistance, call: 1-281-441-4400</p>
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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium Borate (Borax, fused)	1330-43-4	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
 CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.
 DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
 Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact:

Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions: No specific safety phrase has been found applicable for this product.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 1 (mg/m³) from ACGIH (TLV) [United States] [1998] TWA: 1 (mg/m³) [United Kingdom (UK)] TWA: 1 (mg/m³) from NIOSH [United States] TWA: 1 (mg/m³) [Mexico] TWA: 1 (mg/m³) [Canada] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Odorless.

Taste: Not available.

Molecular Weight: 201.22 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: 741°C (1365.8°F)

Critical Temperature: Not available.

Specific Gravity: 2.367 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Partially soluble in cold water, hot water. Solubility in water: 1.06 g/100 ml water @ 0 deg. C Solubility in water: 8.79 g/100 ml water at 40 deg. C Solubility in water: 2.56 g/100 ml water @ 20 deg. C. Insoluble in alcohol

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, moisture

Incompatibility with various substances: Reactive with reducing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Hygroscopic; keep container tightly closed. Incompatible with alkaloid salts, mercuric chloride, zinc sulfate, and other metallic salts. Incompatible with moisture. Forms partial hydrate in moist air.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:

Acute oral toxicity (LD50): 2400 mg/kg [Rat]. Acute dermal toxicity (LD50): >2000 mg/kg [Rabbit].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Dust causes skin irritation. Poorly absorbed through intact skin. Eyes: Dust causes eye irritation. Inhalation: Causes respiratory tract irritation. Ingestion: Acute toxic effects of borates in general are nausea, vomiting, diarrhea, and delayed skin redness, rash, and dizziness. Chronic Potential Health Effects: Chronic exposures can produce eye irritation, coughing, and skin rash (the latter following ingestion).

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: Sodium Borate (Borax, fused) Minnesota: Sodium Borate (Borax, fused) TSCA 8(b) inventory: Sodium Borate (Borax, fused)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

This product is not classified according to the EU regulations. Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 06:29 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet

Copper, powder or dust

ACC# 05430

Section 1 - Chemical Product and Company Identification

MSDS Name: Copper, powder or dust

Catalog Numbers: S72895, S72896, S79977, S79977-1, S79977-2, S79977-3, S79978, S79978-1, S79979, S79979-1, C431-500, C434-500, S4821A, S4821B, S4821C, S4821D, S4821E, S72895ND, S799771, S799772, S799773, S799781, S79978ND, S799791

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-50-8	COPPER	100	231-159-6

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red to brown. **Warning!** Can be explosive when exposed to heat or flames. Causes eye and skin irritation. Inhalation of fumes may cause metal-fume fever. May cause lung damage. May cause liver and kidney damage. Causes respiratory tract irritation.

Target Organs: Kidneys, liver, lungs.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin discoloration.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage.

Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dust can be an explosion hazard when exposed to heat or flame. Non-combustible solid in bulk form, but powdered form may ignite.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
COPPER	0.2 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dusts and	as Cu: 1 mg/m ³ TWA (dusts and mists); 0.1 mg/m ³ TWA (fume) dusts	0.1 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dusts and

mists)	as mists as Cu: 100 mg/m3 IDLH	mists)
--------	--------------------------------	--------

OSHA Vacated PELs: COPPER: 0.1 mg/m3 TWA (fume, dusts, mists as Cu)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: red to brown

Odor: none reported

pH: Not available.

Vapor Pressure: 1 mm Hg @1628C

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: 2595 deg C

Freezing/Melting Point:1083 deg C

Autoignition Temperature: Not applicable.

Flash Point: Not applicable.

Decomposition Temperature:Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Reactivity: 0

Explosion Limits, Lower:Not available.

Upper: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 8.92

Molecular Formula:Cu

Molecular Weight:63.54

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, moisture, exposure to air.

Incompatibilities with Other Materials: Liquid copper explodes on contact with water. Reacts violently with ammonium nitrate, bromates, iodates, chlorates, ethylene oxide, hydrazoic acid, potassium oxide, dimethyl sulfoxide + trichloroacetic acid, hydrogen peroxide, sodium peroxide, sodium azide, sulfuric acid, hydrogen sulfide + air, and lead azide. Ignites on contact with chlorine, fluorine (above 121C), chlorine trifluoride, and hydrazinium nitrate (above 70C). Incompatible with 1-bromo-2-propyne, potassium dioxide, and acetylenic compounds.

Hazardous Decomposition Products: Copper fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-50-8: GL5325000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-50-8: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: Experimental studies show teratogenic effects in laboratory animals.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: Experimental studies show tumorigenic effects in laboratory animals.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-50-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**Section 302 (RQ)**

CAS# 7440-50-8: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-50-8: acute, chronic, flammable.

Section 313

This material contains COPPER (CAS# 7440-50-8, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-50-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-50-8 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-50-8 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 7440-50-8: 0

Canada

CAS# 7440-50-8 is listed on Canada's DSL List. CAS# 7440-50-8 is listed on Canada's DSL List.

This product has a WHMIS classification of D2B, B4.

CAS# 7440-50-8 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7440-50-8: OEL-ARAB Republic of Egypt:TWA 0.1 mg/m³ (fume) OEL-AUSTRALIA:TWA 0.2 mg/m³ (fume) OEL-AUSTRALIA:TWA 1 mg/m³ (dust) OEL-BELGIUM:TWA 0.2 mg/m³ (fume) OEL-BELGIUM:TWA 1 mg/m³ (dust) OEL-DENMARK:TWA 0.1 mg/m³ (fume) OEL-DENMARK:TWA 1 mg/m³ (dust) OEL-FINLAND:TWA 0.2 mg/m³ (fume) OEL-FINLAND:TWA 1 mg/m³ OEL-FINLAND:TWA 1 mg/m³ (dust) OEL-FRANCE:TWA 0.2 mg/m³ (fume) OEL-FRANCE:TWA 1 mg/m³;STEL 2 mg/m³ (dust) OEL-GERMANY:TWA 0.1 mg/m³ (fume) OEL-GERMANY:TWA 1 mg/m³ OEL-GERMANY:TWA 1 mg/m³ (dust) OEL-HUNGARY:TWA 0.2 mg/m³;STEL 0.4 mg/m³ (dust) OEL-INDIA:TWA 0.2 mg/m³ (fume) OEL-THE NETHERLANDS:TWA 0.2 mg/m³ (fume) OEL-THE NETHERLANDS:TWA 1 mg/m³ (dust) OEL-THE PHILIPPINES:TWA 1.0 mg/m³ (fume) OEL-POLAND:TWA 0.1 mg/m³ (fume) OEL-RUSSIA:STEL 0.5 ppm (1 mg/m³) (dust) OEL-SWEDEN:TWA 0.2 mg/m³ (resp. d

ust) OEL-SWEDEN:TWA 0.2 mg/m³ (fume) OEL-SWEDEN:TWA 1 mg/m³ (total dust) OEL-SWITZERLAND:TWA 0.1 mg/m³;STEL 0.2 mg/m³ (fume) OEL-SWITZERLAND:TWA 1 mg/m³;STEL 1 mg/m³ OEL-THAILAND:TWA 0.1 mg/m³ (fume) OEL-THAILAND:TWA 1 mg/m³ OEL-UNITED KINGDOM:TWA 0.2 mg/m³ (fume) OEL-UNITED KINGDOM:TWA 1 mg/m³ OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEAL

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #2 Date: 5/02/2001

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.



P.O. Box 1088 • Roseburg, OR 97470
Ph: 541-679-3311 • Fax: 541-679-2543
Website: www.rfpco.com

MATERIAL SAFETY DATASHEET

Complies with ANSI Z400.1 format

	HMIS Label
Health (potential chronic effects)	1*
Fire Hazard	0
Reactivity	0
Personal Protection – depends on usage	See Section 8

PRODUCTS: Plywood and Composite Wood Panels Produced with Phenol Formaldehyde, Melamine and or PVA Resin systems. Includes Laminated Panels and Panels with a Cured Water Based Pre-Finished Coating. (Note – these products are made with No Added Urea Formaldehyde Resin (NAUF)).

Roseburg Forest Products

Date of Preparation: rev. 08/01/11

Section 1: GENERAL INFORMATION

Chemical Name, Synonyms and Description: : Roseburg plywood and composite panels bonded with phenol formaldehyde, melamine and or PVA resin systems. Includes laminated panels and panels with a cured water based pre-finished coating. This MSDS applies to all Roseburg panels included in the family of products listed below.

(Note – these products are made with No Added Urea Formaldehyde Resin (NAUF)).

- Softwood Plywood
- Hardwood Plywood
- Pre-Finished Plywood (Cured Water Based)
- Composite Panel (Particleboard)
- Decorative Surface Panel
- Thermally Fused Melamine Panel
- Shelving

Chemical Family: Wood
Manufacturer Information:
Roseburg Forest Products
P.O. Box 1088
Roseburg, Oregon 97470
Telephone (541) 679-3311

Formula: Mixture

Prepared by: Roseburg Forest Products and
DeEtta Burrows, MSPH, CIH Wise Steps, Inc.

Section 2: HAZARD IDENTIFICATION

2.1 Emergency Overview: Under normal use this product does not present any type of emergency conditions. If the product is in contact with strong oxidizers or exposure to temperatures greater than 400 degrees F a fire may be caused. Fire smoke contains hazard chemicals such as carbon monoxide, aldehydes and other toxic materials. Airborne wood and resin dust may explode if in high concentrations and combined with an ignition source.

2.2 OSHA regulatory status: This product is generally an article but is regulated under OSHA for the release of wood dust and total dust cured resins during mechanical operations releasing dust. The free formaldehyde levels are below OSHA reporting requirements.

2.3 Potential health effects (See section 11 Toxicology Information for further details)

Routes of Entry: Inhalation and skin contact

Roseburg PF-MF-PVA Bonded Plywood and Composite Panel MSDS 08/01/11 page 2

Target Organs: Eyes, skin, mucous membranes, upper respiratory tract.

Acute: Wood dust may cause dryness, irritation, coughing and sinusitis. Dust may irritate the eyes. Some wood species may cause skin and respiratory irritation. The irritation is generally caused by mechanical action on the skin or mucous membranes.

Chronic: Wood dust, depending on the species, may cause allergic contact dermatitis and respiratory sensitization with prolonged, repetitive contact or exposure to elevated dust levels. Prolonged exposure to dust from some wood species has been reported to be associated with nasal cancer.

Cancer Listing: Wood dust: NTP known to be a Human Carcinogen (10th Report), IARC Monographs Group 1: Carcinogenic to humans; sufficient evidence of carcinogenicity.

Formaldehyde: NTP and OSHA – Probable Human Carcinogen, IARC Group 1 for sufficient evidence that formaldehyde causes nasopharyngeal, a rare cancer in humans, and “limited evidence” for cancer of nasal cavity and sinuses, and a “strong but not sufficient evidence” for leukemia.

Medical Conditions That May Be Aggravated by Exposure: Wood dust may aggravate preexisting respiratory conditions or allergies.

2.4 Potential Environmental Effects: These wood products are not expected or known to pose an ecological hazard as the result of their intended uses.

Section 3 COMPOSITION/INFORMATION ON INGREDIENTS

These wood products are composed of wood and cured resins (phenol and/or melamine formaldehyde resins / veneer laminated panels may include PVA). SEE Section 8 for exposure limits discussion.

Section 4 FIRST AID MEASURES

4.1: First aid procedures

Inhalation: Remove from area to fresh air. Seek medical attention if persistent irritation, severe coughing or breathing difficulty occurs.

Eye Contact: Immediately flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing of the eyes by separating the eyelids with fingers. Seek medical care if irritation persists.

Skin Contact: Wood dust of certain species may elicit allergic contact dermatitis in sensitized individuals and can cause mechanical irritation. Wash affected areas with soap and water. Seek medical attention if rash, irritation or dermatitis persists.

Ingestion: Not applicable under normal use.

4.2 Note to Physicians: None

Section 5 FIRE FIGHTING MEASURES

5.1 Flammable Properties

Flash point: Not Applicable

Flammable limits: LEL Not Applicable, UEL Not Applicable, **Wood and Wood Dusts are combustible**

Autoignition Temperature: Variable typically 400 to 500 degrees F (204 to 260 C)

Building Code & Flame Spread Ratings: ASTM E-84 standard fire test flame spread places the products in a Class C or Class III category. Class C are generally approved for rooms and other areas within all but a few special service-type buildings.

5.2 Extinguishing Media: Water, carbon dioxide, sand, and chemical extinguisher.

5.3 Protection of Firefighters: Self-contained breathing apparatus (SCBA) recommended when fighting fire.

5.4. Hazardous Combustion Products: FIRE can result in carbon dioxide, carbon monoxide, oxides of nitrogen, aldehydes, cyanides and other hazardous gases and particles.

5.5. Unusual Fire & Explosion: Wood dust from sawing, sanding, or machining can be explosive in the presence of an ignition source depending on particle size and moisture content. Airborne concentrations of 40 grams per cubic meter are often used as the lower explosive limit (LEL) for wood dusts. OSHA interprets the explosive level as having no visibility within five feet or less. **NFPA Rating** Scale 0 – 4 Health = 1; Fire = 1, Reactivity = 0

Section 6 ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled: Not applicable for products in purchased form. Wood dust generated from sawing, sanding, or machining may be vacuumed or shoveled for recovery or disposal. Avoid dusty conditions and provide good ventilation. Use NIOSH/MSHA-approved respiratory protection and goggles where exposure limits may be exceeded.

Section 7 HANDLING AND STORAGE

7.1 Handling Precautions: Avoid repeated or prolonged inhalation of wood dust. No special handling precautions are warranted for products in purchased form.

7.2 Storage Precautions: Store in a well-ventilated, cool, dry place, away from ignition sources. Store flat, supported and protected from direct contact with the ground.

Section 8 EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Exposure Guidelines

Component	Percentage	Exposure Limits			
		OSHA PEL	OSHA STEL	ACGIH TLV-TWA	ACGIH TLV-STEL
Wood Solids*	80 - 95%	10 mg/m ³	None	1 mg/m ³ (I)	None
Cured Resin Solids	5 - 20%	PNOS - 10 mg/m ³	None	5 mg/m ³ (I)	None
Formaldehyde**	<0.1%	0.75 ppm	2 ppm	0.3 ppm C	None
Cured Finish (Coatings) or Melamine Surface Materials	<1%	10 mg/m ³	None	10 mg/m ³ (I)	None

* except for Western Red Cedar: 2.5 mg/m³ (OSHA) and 0.5 mg/m³ inhalable (TLV)
 Note: OSHA = Occupational Safety & Health Administration PEL for wood is 15 mg/m³ but many state plans regulated wood dust at 10 mg/m³
 ACGIH = American Conference of Governmental Industrial Hygienists
 PEL = Permissible Exposure Limit
 TWA = Time Weighted Average
 TLV = Threshold Limit Value – recommended levels
 STEL = Short Term Exposure Limit (15-minutes)
 PNOS = Particles not otherwise specified
 I = inhalable
 C = Ceiling Limit, never to be exceeded

** These products are specially processed to meet the CARB Phase II requirements. Formaldehyde at these levels is not regulated by OSHA as formaldehyde containing.

8.2 Engineering Controls

Required Ventilation: Not applicable for the product in purchased form. If dust is generated provide local exhaust ventilation as needed so that exposures are below exposure limits.

8.3 Personal Protective Equipment (PPE)

Eye Protection: Goggles or safety glasses are recommended when manufacturing, sanding, sawing or machining product.

Skin Protection: Protective Gloves: Cloth, canvas or leather gloves are recommended for protection against mechanical irritation or wood splinters.

Respiratory Protection: Not applicable for products in purchased form. Use a NIOSH/MSHA approved respirator when the allowable exposure limits may be exceeded during mechanical processing.

General Hygiene Considerations: None required for product in purchased form. Other protective equipment, such as gloves and outer garments, may be needed depending on dust conditions.

Section 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (F⁰): Not applicable
Vapor Pressure (mm Hg): Not applicable
% Volatiles by Volume (@70°F(21°C)): 0
Vapor Density (air =1): Not applicable

Solubility in Water: <0.1%
pH: Not applicable
Evaporation Rate: Not applicable
Spec Gravity (H₂O=1): 0.40-0.80, variable depends on wood species and moisture

Section 10 STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: Avoid open flame. Product may ignite at temperatures in excess of 400⁰F (204⁰C).

Incompatible Materials: Concentrated acids or bases will alter the product. Avoid contact with magnesium, aluminum, zinc (galvanized), tin, chromium, brass and bronze. Contact with these materials may generate hydrogen which is explosive. Exposure to elevated temperatures or strong acids or bases will cause polymerization with evolution of formaldehyde, phenol and/or water.

Hazardous Decomposition Products: Thermal and/or thermal-oxidative decomposition can produce irritating toxic fumes and gases, including carbon monoxide, carbon dioxide, phenol, formaldehyde, sulfur oxides, nitrogen oxides, and hazardous particles.

Hazardous Polymerization: Will not occur

Section 11 TOXICOLOGICAL INFORMATION

Toxicity Data: None available for products in purchased form. Individual component information is provided below if available.

Wood Dust:

The wood in this product is a potential mixture of soft and hardwoods. Overexposures to wood dusts may cause respiratory ailments including bronchitis, impairment of breathing functions, and asthma. Certain exotic woods contain alkaloids that can cause headache, anorexia, nausea, and difficulty with breathing.

Wood Dust Carcinogenicity Listing: Wood dust is listed by NTP known to be a Human Carcinogen (10th Report), IARC Monographs: Wood dust, Group 1 - IARC Group 1: Carcinogenic to humans; sufficient evidence of carcinogenicity. This classification is primarily based on studies showing an association between occupational exposure to wood dust and adenocarcinoma of the nasal cavities and paranasal sinuses. IARC did not find sufficient evidence of an association between occupational exposure to wood dust and cancers of the hypopharynx, oropharynx, lymphatic and hematopoietic systems, lungs, stomach, colon or rectum.

Section 12 ECOLOGICAL INFORMATION

No information available at this time. As with all foreign substances do not allow to enter the storm drainage systems. These wood products are not expected to pose an ecological hazard as a result of their intended use.

Section 13 DISPOSAL CONSIDERATIONS

Follow safe solid waste disposal guidelines in accordance with federal, state and local regulations. If disposed of or discarded in its purchased form, incineration is the preferred method. Dry land disposal is acceptable in most states. It is however, the user's responsibility to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste.

Section 14 TRANSPORT INFORMATION

Not regulated as a hazardous material by the U.S. Department of Transportation.

Section 15 REGULATORY INFORMATION

It is the user's responsibility to determine what regulatory information is relevant dependant upon the usage of this product.

EPA – TSCA: The resin components are listed in TSCA inventory
EPA – CERCLA: The following ingredient is on the SARA Section 302 EHS, 304 EHS and CERCLA lists: Formaldehyde CAS #50-00-0
EPA SARA 313: No chemicals subject to Section 313 in the product (contains less than 0.1% formaldehyde – de minimis concentration)
EPA SARA 311/312 Hazard Category: Under Section 311 and 312 considered: an immediate acute health hazard, a delayed chronic health hazard but not a fire or reactivity or sudden release hazard.
Canadian Domestic Substance List (DSL) inventory includes Formaldehyde CAS# 50-00-0
WHMIS Ingredient Disclosure List: Formaldehyde CAS#50-00-0, Controlled Product D2A

California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Initiative Measure, Proposition 65): Title 22 California Code of Regulations requires that a clear and reasonable warning be given before exposure to chemicals listed by the State as causing cancer or reproductive toxicity. Formaldehyde and Wood Dust are on California's list of chemicals known to the State to cause cancer. Solvents found in the uncured resin coating contain n-methyl pyrrolidone (developmental) and ethylbenzene as a cancer agent. The warning required to be posted in the work areas where these products are used is:

Prop 65 WARNING: *Drilling, sawing, sanding or machining wood products generates wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection.*

Minnesota Statutes 1984 Section 144.495 and 325 F.18 required that all particleboard and medium-density fiberboard sold or used in Minnesota meet the HUD Formaldehyde Emissions Standard, 24 CFR Sections 3280.308 and 3280.406.

New Jersey: Under certain conditions, this product may release free formaldehyde vapors. Formaldehyde is a substance listed on New Jersey's *Environmental Hazardous Substance List*.

Pennsylvania: Under certain conditions, this product may release free formaldehyde vapors. Sawing, sanding or machining this product may generate wood dust. Formaldehyde and certain hardwoods as oak and softwoods are substances that appear on Pennsylvania's *Appendix A – Hazardous Substance List*.

Independent third-party testing done in accordance with ASTM E1333 Large Chamber Test, confirms that the emissions are less than 0.2 ppm. Thus these panels meet Department of Housing and Urban Development (HUD) Manufacturing Home Construction and Safety Standards, 24 CFR Part 3280, which does not permit the emission rates to exceed 0.2 ppm.

SECTION 16 OTHER INFORMATION

HMIS Hazard Rating (0- Insignificant, 1- Slight, 2- Moderate, 3- High, 4- Extreme, * = chronic effects) Health – 1* Flammability - 0 Reactivity - 0 Personal Protective Equipment – Depends on use conditions – see Section 8

Definition of Common Terms:

ACGIH = American Conference of Governmental Industrial Hygienists
C = Ceiling Limit
CAS# = Chemical Abstracts System Number
CARB = Consortium for Advanced Residential Buildings
DOT = U. S. Department of Transportation
DSL = Domestic Substance List
EC50 = Effective concentration that inhibits the endpoint to 50% of control population
EPA = U.S. Environmental Protection Agency
HMIS = Hazardous Materials Identification System
IARC = International Agency for Research on Cancer
LC50 = Concentration in air resulting in death to 50% of experimental animals
LCLo = Lowest concentration in air resulting in death
LD50 = Administered dose resulting in death to 50% of experimental animals
LDLo = Lowest dose resulting in death
LEL = Lower Explosive Limit
NAP = Not Applicable
NAV = Not Available
NIOSH = National Institute for Occupational Safety and Health
NFPA = National Fire Protection Association
NPRI = Canadian National Pollution Release Inventory
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
PEL = Permissible Exposure Limit
RCRA = Resource Conservation and Recovery Act
STEL = Short-Term Exposure Limit (15 minutes)
STP = Standard Temperature and Pressure
TCLo = Lowest concentration in air resulting in a toxic effect
TDG = Canadian Transportation of Dangerous Goods
TDLo = Lowest dose resulting in a toxic effect
TLV = Threshold Limit Value
TSCA = Toxic Substance Control Act
TWA = Time-Weighted Average (8 hours)
UEL = Upper Explosive Limit
WHMIS Workplace Hazardous Materials Information System

Disclaimer

Roseburg Forest Products believes the information contained in this MSDS to be accurate at the time of preparation and has been compiled using sources believed to be reliable. However, Roseburg Forest Products makes no warranty, either expressed or implied, concerning the accuracy or completeness of the information presented. It is the responsibility of the user to comply with local, state, and federal regulations concerning use of this product. It is the further

responsibility of the buyer to research and understand safe methods of storing, handling and disposal of this product.

Safety Data Sheet

Section 1 – PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER: Cardinal Ethanol, LLC
ADDRESS: 1554 N. 600 East
 Union City, IN 47390
PHONE NUMBER: 765-964-3137

PRODUCT NAME: Dried Distillers Grains
COMMON NAME: DDG
CHEMICAL NAME: Not Applicable

CHEMICAL FORMULA: Not Applicable
CHEMICAL FAMILY: Grains, Fibers

Section 2 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Tan granular product with roasted corn aroma

OSHA HAZARD CLASS

Dust from this product may be considered an eye irritant

WHMIS CLASSIFICATION

Dust from this product may be considered an eye irritant

SYNERGISTIC MATERIALS

Not available

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Inhalation, Dermal, Ingestion.

ACUTE EFFECTS OF OVER EXPOSURE:

Eyes – Dust is eye irritant.

Skin – Not applicable

Inhalation - Solid

Ingestion – It is unlikely that an acute hazard would be posed from ingestion of this product.

CHRONIC EFFECTS OF OVER EXPOSURE: Not available

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Not available

CARCINOGENICITY: Not available

Section 3 – COMPOSITION AND INFORMATION ON INGREDIENTS

INGREDIENTS	PERCENTAGES (by weight)	CAS #	TLV (ppm)
Major components			
Ground Corn	88 – 90%	Not Applicable	Not Applicable
Water (remainder)	10 – 12%	Not Applicable	Not Applicable
Exposure Limits			
Nuisance Particles	PEL (TWA) 10 mg/m ³	PEL (STEL) N/A	TLV (TWA) 4 mg/m ³

Section 4 – FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact - If material comes in contact with the eyes, flush with water

Skin Contact – Wash with soap and water

Inhalation - Not available

Ingestion - It is unlikely that an acute hazard would be posed from ingestion of this product.

NOTES TO PHYSICIAN -Dried Distillers Grain is an animal feed product.
-Health effects upon exposure or ingestion are expected to be minimal.

Section 5 – FIRE FIGHTING MEASURES

FLASH POINT: Not applicable

AUTO IGNITION TEMP: Not applicable

**FLAMMABLE LIMITS IN AIR
% BY VOLUME**

LOWER
55 gm/m³

UPPER
Unknown

EXTINGUISHING MEDIA:

Large Fires: Apply water fog or all-purpose-type foams by manufacturers' recommended techniques

Small Fires: Use carbon dioxide or dry chemical media

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not allow dust to accumulate, spark may cause explosion.

HAZARD RATINGS: NFPA 704: Health- 1 Fire- 1 Reactivity- 0

Section 6 – ACCIDENTAL RELEASE MEASURES

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED: Not applicable.

Section 7 – HANDLING AND STORAGE

HANDLING AND STORING: Handle and/or store as you would any other grain product—below 14%moisture.

Section 8 – EXPOSURE CONTROL – PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate ventilation to keep dust levels below permissible concentrations.

RESPIRATORY EQUIPMENT: Dust mask generally not required. Use appropriate NIOSH-approved respiratory protection where atmospheric concentrations may exceed acceptable exposure limits. User should consult a respirator guide, such as NIOSH or the Canadian Standards Association's guide.

VENTILATION: Local ventilation is recommended where practical.

EYE PROTECTION: Safety glasses or goggles where contact with material may occur

PROTECTIVE CLOTHING: Neoprene gloves or natural rubber gloves may be used.

OTHER (SAFETY SHOWERS, EYE WASH STATIONS, ETC.): Eyewash, safety shower generally not needed, but this and other protective equipment as required.

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Tan granular product
BOILING POINT °C at 760mm/Hg: N/A
VAPOR PRESSURE: Not applicable
SOLUBLE IN WATER: Insoluble

FLASH POINT: Not applicable
FREEZING POINT °C: N/A
pH: Not Applicable
MISCIBILITY IN WATER: Not Applicable

EVAPORATION RATE (butyl acetate=1): Negligible
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not Applicable

ODOR: Roasted corn aroma
SPECIFIC GRAVITY (water=1): Not applicable
VAPOR DENSITY (air=1): Not applicable
DENSITY, kg/L @20°C: approximately 1

AUTO IGNITION TEMP: Not applicable
% VOLATILES BY VOLUME: Not Applicable
DISTILLATION RANGE, °C: Not Applicable

Section 10 – STABILITY AND REACTIVITY

STABILITY
 STABLE X
 UNSTABLE _____

INCOMPATIBILITY -
CONDITIONS TO AVOID: Avoid dust accumulation in air.

MATERIALS TO AVOID: Not applicable

INCOMPATIBILITY: Not applicable

HAZARDOUS DECOMPOSITION PRODUCTS: Not applicable

HAZARDOUS POLYMERIZATION: Will not occur.

Section 11 – TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE: Inhalation, ingestion, skin and eye contact.

TOXICOLOGICAL DATA:

LC50, ppm/4h	LD50, mg/kg Rat, Inhale	LD50, mg/kg Rat, Oral	Rabbit, Skin
Corn Germ	Not Applicable	Not Applicable	Not Applicable
Water (remainder)	Not Applicable	Not Applicable	Not Applicable

Section 12 – ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ECOTOXICITY: Not Applicable.

PERSISTANCE/BIODEGRADATION: Readily biodegradable in the environment

BIOACCUMULATION: Not Applicable.

MOBILITY IN ENVIRONMENT: Not Applicable.

Section 13 – DISPOSAL CONSIDERATION

SPILL PROCEDURES: Sweep into container.

WASTE DISPOSAL PROCEDURES: Waste material should be disposed of using conventional methods, in compliance with all federal, provincial and local government regulations.

Section 14 – TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: Not Applicable

DOT HAZARD CLASS: Not Applicable

DOT IDENTIFICATION NUMBER: Not Applicable

DOT EMERGENCY RESPONSE GUIDE NUMBER: Not Applicable

Section 15 – REGULATORY INFORMATION

FEDERAL REGULATIONS: Not Applicable

Section 16 – OTHER INFORMATION

Prepared By: Cardinal Ethanol, LLC

Revision Date: April 29, 2012

DISCLAIMER: THE INFORMATION IN THIS SAFETY DATA SHEET (SDS) IS BELIEVED TO BE CORRECT AS OF THE DATE ISSUED. AS A SERVICE TO OUR RECIPIENTS, CARDINAL ETHANOL, LLC PROVIDES INFORMATION IN ELECTRONIC FORM. DUE TO LIMITED LABORATORY EXPERIENCE WITH SAID MATERIAL AND THE REMOTE POSSIBILITY THAT ELECTRONIC TRANSFER MAY HAVE RESULTED IN ERRORS, ALTERATIONS, OR OMISSIONS IN THIS INFORMATION, CARDINAL ETHANOL, LLC THEREFORE MAKES NO REPRESENTATIONS AS TO ITS COMPLETENESS OR ACCURACY. IN ADDITION, DATA ACQUIRED FROM DATABASES MAY NOT BE AS CURRENT AS THE DATA IN THE MSDS AVAILABLE DIRECTLY FROM CARDINAL ETHANOL, LLC. A PRINT COPY OF THIS SDS IS AVAILABLE UPON REQUEST FROM CARDINAL ETHANOL, LLC.



SECTION 1		PRODUCT AND COMPANY INFORMATION				
TRADE NAME:	MicroEssentials SZ					
CHEMICAL NAME:	Monoammonium Phosphate with Sulfur and Zinc					
CAS NUMBER:	MAP: 7722-76-1 Sulfur: various Zinc: various					
CHEMICAL FAMILY:	Ammonium Phosphates- Inorganic Salts					
SYNONYMS:	Monoammonium Phosphate + Sulfur and Zinc Monobasic Ammonium Phosphate + Sulfur and Zinc Ammonium Dihydrogen Phosphate + Sulfur and Zinc MESZ MAP + S + Z Ammonium dihydrogen orthophosphate					
PRIMARY USE:	Crop nutrient to be applied as intact granule					
COMPANY INFORMATION:	<p style="text-align: center;">The Mosaic Company Atria Corporate Center 3033 Campus Drive, Suite E490 Plymouth, MN 55441USA www.mosaicco.com</p> <p>For non-emergency questions, phone hours are 8 AM to 5 PM Central Time US 800.918.8270 (toll free) 763.577.2700 (phone)</p>					
EMERGENCY TELEPHONE:	<p style="text-align: center;">EMERGENCY OVERVIEW 24 Hour Emergency Telephone Number For Chemical Emergencies: Spill, Leak, Fire or Accident Call CHEMTREC North America: (800) 424-9300 Others: (703) 527-3887 (collect)</p>					
SECTION 2		HAZARD IDENTIFICATION				
EMERGENCY OVERVIEW :	Health Hazards:	Avoid contact with eyes, skin and clothing. Avoid ingestion. Wash thoroughly after handling. Also refer to Sections 11, and 15.				
	Physical Hazards:	Slippery when wet.				
	Physical Form:	Solid				
	Appearance:	Grey, tan, brown, or black granules				
	Odor:	Slight ammonia odor				
	Toxicity:	Non-toxic				
	NFPA HAZARD CLASS		HMIS HAZARD CLASS		WHMIS HAZARD CLASS	
	Health:	2	Health:	2	Symbol	N/A
	Flammability:	0	Flammability:	0	Classification	Not WHMIS controlled
	Instability:	0	Physical Hazard:	0	Sub Class (N/A)	
Special Hazard:	None	PPE:	Section VIII			

Status: Revised
Section(s) Revised: All
Revision Date: 12/21/2012

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MSDS #: MOS-100038.01

POTENTIAL HEALTH EFFECTS:	Eye:	Contact may cause eye irritation including stinging, watering and redness.
	Skin:	Contact may cause mild irritation including redness and a burning sensation. No harmful effects from skin absorption have been reported.
	Inhalation (Breathing):	Effects of overexposure to dusts can include irritation of the eyes and respiratory tract, pneumoconiosis (dust congested lungs) pneumonitis (lung inflammation), coughing, vomiting, diarrhea, abdominal pain. Contact with particulate matter may cause irritation of the nose and throat, coughing and shortness of breath including a burning sensation.
	Ingestion (Swallowing)	Moderate degree of toxicity by ingestion, however ingestion is NOT an intended use.
	Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, headache, runny nose, coughing, shortness of breath, abdominal cramping and chest pain.
	Cancer:	Data not available.
	Target Organs:	Data not available.
	Developmental:	Inadequate data available.
	Other Comments:	<p>These comments relate to minor ingredients or impurities that are present and bound within finished product granules. Overexposure to these minor components during proper handling and use are not expected.</p> <p>Allergic skin responses after repeated contact with sulfur, a component, have been reported but are not common.</p> <p>Prolonged or repeated overexposure to fluoride compounds may cause fluorosis. Fluorosis is characterized by skeletal changes, consisting of osteosclerosis (hardening or abnormal density of bone) and osteomalacia (softening of bones) and by mottled discoloration of the enamel of teeth (if exposure occurs during enamel formation). Symptoms may include bone and joint pain and limited range of motion.</p>
	Pre-Existing Medical Conditions:	Skin and Respiratory (asthma-like) disorders.
POTENTIAL ENVIRONMENTAL EFFECTS:	MicroEssentials SZ is considered biodegradable and is taken up as a nutrient by vegetation. Large spills can harm or kill vegetation. May release ammonium ions that are toxic to fish in water systems. May release phosphates which will result in algae growth, increased turbidity and depleted oxygen in water systems.	

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SECTION 3		COMPOSITION INFORMATION ON INGREDIENTS	
COMPOSITION:	Phosphate as P ₂ O ₅	Primary nutrient ingredient	40%
	Nitrogen as N	Primary nutrient ingredient	12%
	Water	Trace as moisture	0.5 – 2%
	Sulfur as S	Secondary nutrient ingredient	5%
	Sulfate as S	Secondary nutrient ingredient	5%
	Zinc as Zn	Micro nutrient	1%
	Fluorides as F	Impurity	2-4%
SECTION 4		FIRST AID MEASURES	
FIRST AID PROCEDURES:	Eyes:	Move victim away from exposure and into fresh air. Flush eyes with plenty of clean water for at least 15 minutes. If symptoms persist, seek medical attention.	
	Skin:	Wash contaminated area thoroughly with mild soap and water. If chemical or solution soaks through clothing, remove clothing and wash contaminated skin. If irritation develops and persists after washing, seek medical attention.	
	Inhaled:	If respiratory symptoms develop (see Signs and Symptoms, Section 2), move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.	
	Ingestion:	If exposed individual is conscious, immediately give water or milk. Do not induce vomiting. Seek medical attention. If person is unconscious, do not give anything by mouth.	
NOTE TO PHYSICIAN:	If individual has been exposed to concentrated decomposition products (see Section 10), treat symptomatically and watch for delayed symptoms of pulmonary edema.		
SECTION 5		FIRE FIGHTING MEASURES	
FLAMMABLE PROPERTIES:	Flash Point:	Not applicable	
	OSHA Flammability Class:	Not applicable	
	LEL/UEL:	LEL: Not explosible (at product concentration) UEL: Not explosible (at product concentration)	
	Auto-Ignition Temperature:	Not applicable	
EXTINGUISHING MEDIA:	Use extinguishing agent suitable for type of surrounding fire. Avoid use of excessive quantities of water to minimize runoff to environment (see Section 2). Small fires: water spray, foam, dry chemical or CO ₂ – collect or direct water to containment Large fires: water spray, fog or foam – collect or direct water to containment		
PROTECTION OF FIREFIGHTERS:	Positive pressure, Self-Contained Breathing Apparatus (SCBA) is required for all fire-fighting activities involving hazardous materials. Section 10 notes decomposition products that may evolve.		

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SECTION 6		ACCIDENTAL RELEASE MEASURES	
RESPONSE TECHNIQUES:	Stay upwind and away from product spill that may generate a dust hazard. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other drainage systems, and natural waterways. Notify appropriate federal, state/provincial and local agencies as may be required (see Section 15.) Sweep up and package appropriately for use as intended or disposal; minimize dust generation during cleanup.		
RELEASE NOTES :	If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the United States, contact the US COAST GUARD NATIONAL RESPONSE CENTER toll-free number 800-424-8802. In case of accident or road/rail spill notify: CHEMTREC in North America at 800-424-9300 and from other countries (collect) at 0-703-527-3887. (See Section 1)		
SECTION 7		HANDLING AND STORAGE	
HANDLING:	This product is intended for use intact - as produced and shipped by Mosaic.		
	The use of appropriate respiratory protection is advised when airborne concentrations exceed any established exposure limits (see Section 8). Avoid contact with eyes, mouth, nose, hands/skin, and clothing. Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.		
STORAGE:	Avoid systems that would tend to segregate dust or any components of this product. Avoid accumulation of fugitive dust, as high concentrations of sulfur dust may present an explosion hazard. Follow standard safe-work practices, including hot-work procedures when working around this product.		
	Use and store this material in cool, dry, well-ventilated areas. Store only in approved containers. Keep container(s) tightly closed. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Material may absorb moisture from the air.		
SECTION 8		EXPOSURE CONTROLS / PERSONAL PROTECTION	
ENGINEERING CONTROLS:	Use process enclosure, general dilution ventilation or local exhaust systems where necessary to maintain airborne dust concentration below the OSHA standards (see Section 8) or in accordance with applicable regulations.		
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face:	Approved eye/face protection to safeguard against potential eye contact, irritation or injury is advised. Eye protection that provides a seal to the skin around the eye is advised.	
	Skin:	The use of cloth or leather work gloves is advised to prevent skin contact and irritation.	
	Respiratory:	Use a dust mask or other appropriate respiratory protection where engineering controls are not feasible or during operations that generate airborne concentrations exceeding the relevant standards.	
	Other:	A source of clean water should be available in the work area for flushing eyes and skin.	
GENERAL HYGIENE CONSIDERATIONS:	Use in adequate ventilation. Wash thoroughly after handling.		

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EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	Particulates Not Otherwise Specified (nos): 5 mg/m ³ TWA (respirable) 15 mg/m ³ TWA (total) Ammonia: 50 ppm (35 mg/m ³) TWA Fluorides, as F : 2.5 mg/m ³ TWA
	ACGIH Threshold Limit Value (TLV):	Particulates Not Otherwise Specified (nos): 3 mg/m ³ TWA (respirable) 10 mg/m ³ TWA (total) Ammonia: 25 ppm (18 mg/m ³) TWA 35 ppm (27 mg/m ³) STEL
SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES	
Note: Unless otherwise stated, values in this section are determined at 20 °C (68 °F) and 760 mm Hg (1 atm).		
Flash Point:	Not applicable	
Flammability/ Explosive Limits (%):	LEL: Not explosive (at product concentration) UEL: Not explosive (at product concentration)	
Auto-Ignition Temperature:	Not applicable	
Appearance:	Grey, tan, brown, or black granules	
Physical State:	Solid	
Odor:	Slight ammonia odor	
pH:	4.2-5.0 in a 1% solution.	
Vapor Pressure (mm Hg):	Not applicable	
Vapor Density (air=1):	Not applicable	
Boiling Point:	Not applicable	
Freezing/Melting Point:	Decomposes at 374 °F (190 °C) before melting.	
Solubility in Water:	80% - 90% 328 g/L at 20 °C	
Specific Gravity:	Not applicable	
Volatility:	Not applicable	
Bulk Density:	57 - 66 lbs./ft ³ (Packed); 54 - 62 lbs./ft ³ (Loose)	
SECTION 10	STABILITY AND REACTIVITY	
Chemical Stability:	Stable under normal conditions of storage and handling. Decomposes at 374 °F (190 °C).	
Conditions to Avoid:	Extreme temperatures	
Incompatible Materials:	Avoid contact with alkaline materials	
Hazardous Decomposition Products:	If heated to the point of decomposition, oxides of phosphorus, nitrogen and/or sulfur (e.g., SO ₂) may be released, as well may ammonia and fluoride vapor.	
Corrosiveness:	May be corrosive to iron and mild steels, aluminum, zinc, and copper.	
Hazardous Polymerization:	Will not occur.	

SECTION 11	TOXICOLOGICAL INFORMATION
Acute Oral Toxicity	Monoammonium Phosphate – LD50(rat) >2000 mg/kg Ammonium Sulfate – LD50(rat) = 2000 to 4250 mg/kg, LD50(mouse) = 640 or 4,280 mg/kg
Acute Inhalation Toxicity	Data not available for mixture or components
Acute Dermal Toxicity	Data not available Monoammonium Phosphate – LD50(rat) >5000 mg/kg Ammonium Sulfate – LD50(rat and mouse) >2000 mg/kg
Mutagenesis	Data not available for mixture or major component
Target Organ	Data not available for mixture or major component
Developmental Toxicity	Data not available for mixture. The available data for components are inadequate.
Carcinogenicity	The ingredient(s) of this product is (are) not classified as carcinogenic by NTP (National Toxicology Program), IARC, or OSHA
SECTION 12	ECOTOXICOLOGY
ECOTOXICOLOGY:	This product is a concentrated source of nutrients that have been indicated (see Section 2) to impact vegetation and aquatic systems. May release ammonium ions that are toxic to fish. Un-ionized ammonia concentrations above 0.02 mg/l are considered toxic (USA) in fresh water. May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen. At extremely high concentrations, this may be hazardous to fish or other marine organisms. Release to watercourses may cause effects downstream.
SECTION 13	DISPOSAL CONSIDERATIONS
	It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. Consult federal state/provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.
SECTION 14	TRANSPORTATION INFO
Regulatory Status	Not regulated
Proper Shipping Name	Not applicable
Hazard Class	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) Regulations Canada.
Packing Group	Not applicable
Identification Number	HTS (Harmonized Tariff Schedule) Code 3105.40.0050
Guide Number	Not applicable

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SECTION 15	REGULATORY INFORMATION
FDA:	Phosphate compounds are Generally Recognized As Safe (GRAS) by the U.S. Food and Drug Administration (21 CFR 582.1141; Bhat and Ramaswamy 1993) which allows them to be used as food and color additives.
CERCLA:	Product is not listed with an RQ (reportable quantity)
RCRA 261.33:	Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof are not listed as hazardous waste
SARA TITLE III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	SARA – 311/312: Solid; Immediate (acute): Yes (MAP); Chronic: No; Fire: No; Pressure: No; Reactivity: No SARA – 313: Listed (Zinc compounds) SARA – 302/304: Zinc 1,000 lb RQ
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL and NDSL:	DSL: Yes NDSL: Not listed
TSCA:	Components are listed or exempt from being listed on the TSCA inventory.
CA Proposition 65: (Health & Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.
WHMIS:	Not controlled
CBSA:	Canadian Border Services Agency- This product does not contain any bovine, ruminant or other animal by-products.
SECTION 16	OTHER INFORMATION
Disclaimer:	The information in this document is believed to be correct as of the date issued. Nothing herein contained shall be deemed to be a representation or warranty with respect to the product described herein. NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE, AND ALL SUCH REPRESENTATIONS AND WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED BY MOSAIC. This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions and use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.
Preparation:	The preparation of this MSDS was in accordance with ANSI Z400.1-2010.
References:	FCI Chemical Engineers Fertilizer Technical Data Book, 1994
Note to _____ (if applicable):	Not applicable



1. CHEMICAL PRODUCT and COMPANY INFORMATION

Global Companies LLC
800 South St. Water Mill Center
Waltham, MA 02454-9161

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC** **(800) 424-9300**
COMPANY CONTACT (business hours): **Corporate Safety** **800-542-0778**

SYNONYMS: **#2 Heating Oil; Heating Oil Plus™; 2 Oil; Off-road Diesel Fuel; High Sulfur Diesel**
See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
#2 Fuel Oil	OSHA PEL-TWA: 5 mg/m as mineral oil mist	100
CAS NUMBER: 68476-30-2	ACGIH TLV-TWA: 1997 NOIC - 100 mg/m ³ , skin, A3	
Naphthalene	OSHA PEL-TWA: 10 ppm	Typically 0.1
CAS NUMBER: 91-20-3	ACGIH TLV-TWA/STEL: 10 / 15 ppm, A4	

A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
CAUTION!

OSHA NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED

OVERVIEW

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation. Long-term, repeated exposure may cause skin cancer.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia fluid in the lungs).

EYES

Contact with eyes may cause mild irritation.

SKIN

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Similar products have produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).



4. FIRST AID MEASURES

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material, which enter the mouth, should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT: 100.4 °F (38 °C) minimum ATSM D-396
AUTOIGNITION POINT: 494 °F (257 °C)
OSHA/NFPA FLAMMABILITY CLASS: 2 (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT (%): 0.6
UPPER EXPLOSIVE LIMIT (%): 7.5

FIRE AND EXPLOSION HAZARDS

OSHA and NFPA Class 2 COMBUSTIBLE LIQUID (see Section 14 for transportation classification). Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPCC, SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.



Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8). Local and / or Federal notification may be required if this material is released to the environment (see Section 15 for additional information).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame!

No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this product is loaded into tanks previously containing low flash point products (such as gasoline) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

STORAGE PRECAUTIONS

Keep containers closed and clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Use approved vented storage containers. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. Protect containers from damage and vehicular traffic. Post "No Smoking" signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse.

Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E. I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI 288.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.



9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

Red or reddish/orange colored (dyed) liquid

ODOR

Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	340 to 700 °F (171 to 371 °C)
VAPOR PRESSURE:	0.009 psia @ 70 °F (21 °C)
VAPOR DENSITY (air = 1):	> 1.0
SPECIFIC GRAVITY (H2O = 1):	AP 0.87
PERCENT VOLATILES:	100
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H2O):	Negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

INCOMPATIBLE MATERIALS

Keep away from strong acids and oxidizers; Viton®; Fluorel

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute Oral LD50 (rat): 14.5 ml/kg

Acute Dermal LD50 (rabbit): > 5 ml/kg

Guinea Pig Sensitization: negative

Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits)

Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenic: IARC: NO NTP: NO OSHA: NO ACGIH: 1997 NOIC: A3

Dermal carcinogenicity: positive - mice

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product is similar to Diesel Fuel. IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MUTAGENICITY (genetic effects)

Material of similar composition has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations (See Section 15 for additional information).

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	FUEL OIL, NO. 2
HAZARD CLASS & PACKING GROUP:	3, PG III
DOT IDENTIFICATION NUMBER:	NA 1993
DOT SHIPPING LABEL:	FLAMMABLE LIQUID
EMERGENCY RESPONSE GUIDEBOOK GUIDE NUMBER:	128

May be reclassified for transportation as a COMBUSTIBLE LIQUID under conditions of DOT 49 CFR 173.120(b)(2).



No. 2 Fuel Oil MATERIAL SAFETY DATA SHEET

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

EPA NOTIFICATION (OIL SPILLS)

If there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

RCRA Information

If disposed, this product would be considered a hazardous waste under RCRA with an EPA waste code of D001 for the characteristic of ignitibility.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause, which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product does not contain toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. However, Polycyclic Aromatic Compounds (PACs) are coincidentally manufactured from the combustion of various fuel oils and other petroleum products. Under SARA Section 313, the de minimis exemption has been eliminated for PACs and other listed persistent bio-accumulative and toxic chemicals (PBTs). Refer to EPA guidance for additional reporting information.

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3(Combustible Liquid); Class D, Division 2, Subdivision B (Toxic by other means)

16. OTHER INFORMATION

NFPA@ HAZARD RATING

HEALTH:	1	Slight
FIRE:	2	Moderate
REACTIVITY:	0	Negligible

HMIS@ HAZARD RATING

HEALTH:	1 *	Slight
FIRE:	2	Moderate
REACTIVITY:	0	Negligible

* Chronic

ABBREVIATIONS:

AP = Approximately <= Less than >= Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million



No. 2 Fuel Oil MATERIAL SAFETY DATA SHEET

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute	PEL	Permissible Exposure Limit (OSHA)
AIHA	American Industrial Hygiene Association	RCRA	Resource Conservation and Recovery Act
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	REL	Recommended Exposure Limit (NIOSH)
ANSI	American National Standards Institute	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
DOT	U.S. Department of Transportation	SCBA	Self-Contained Breathing Apparatus
EPA	U.S. Environmental Protection Agency	SPCC	Spill Prevention, Control, and Countermeasures
HMIS	Hazardous Materials Information System	STEL	Short-Term Exposure Limit (generally 15 minutes)
IARC	International Agency For Research On Cancer	TLV	Threshold Limit Value (ACGIH)
MSHA	Mine Safety and Health Administration	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average (8 hr.)
NIOSH	National Institute of Occupational Safety and Health	WEEL	Workplace Environmental Exposure Level (AIHA)
NOIC	Notice of Intended Change	WHMIS	Canadian Workplace Hazardous Materials Information System
NTP	National Toxicology Program		
OPA	Oil Pollution Act of 1990		

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

Material Safety Data Sheet



1. Product and company identification

Product name	Fuel oil, residual
MSDS #	SMI2111.
Code	SMI2111.
Product use	Fuel for industrial, marine and commercial boilers and furnaces; fuel for low and medium speed diesel engines. For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Synonyms	RMG 380, RMG 380LS, RMG 380XX, RMG 380LSXX RMG 500, RMG 500XX RMG 700, RMG 700XX RMH 380, RMH 380LS, RMH 380XX, RMH 380LSXX RMH 700, RMH 700XX RMK 380, RMK 380LS, RMK 380XX, RMK 380LSXX RMK 500, RMK 500XX RMK 700, RMK 700XX
Supplier	BP Products North America Inc 30 South Wacker Drive Chicago, Illinois 60606
EMERGENCY HEALTH INFORMATION:	Direct Phone +1 630 961 6200 (24/7) Toll Free 1 800 321 8642 (24/7)
E-mail address	bpcares@bp.com

2. Hazards identification

Physical state	Liquid.
Color	Dark Brown. / Black.
Emergency overview	WARNING ! COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED. INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. HARMFUL ON PROLONGED OR REPEATED INHALATION. VAPOR MAY CONTAIN HYDROGEN SULFIDE (H2S) GAS WHICH CAN BE HARMFUL OR FATAL IF INHALED. MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER. HEATED MATERIAL CAN CAUSE THERMAL BURNS. Combustible liquid. Harmful if swallowed. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that can cause target organ damage. Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	Dermal contact. Eye contact. Inhalation.
Potential health effects	
Eyes	May cause eye irritation. Heated material can cause thermal burns.

Skin	May cause skin irritation. Harmful in contact with skin. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Possible cancer hazard based on skin painting studies in laboratory animals. Heated material can cause thermal burns.
Inhalation	Vapors may cause drowsiness and dizziness. Can cause central nervous system (CNS) depression. May cause respiratory tract irritation. Vapor may contain hydrogen sulfide (H2S) gas which can be harmful or fatal if inhaled.
Ingestion	Harmful if swallowed.

See toxicological information (Section 11)

3. Composition/information on ingredients

The liquid product from various refinery streams, usually residues. The composition is complex and varies with the source of the crude oil.

Ingredient name	CAS #	%
Fuel oil, residual	68476-33-5	100
Contains:		
Sulfur	7704-34-9	0 - 4
Naphthalene	91-20-3	0.1 - 3
Ethylbenzene	100-41-4	0.1 - 0.5
Polycyclic aromatic hydrocarbons (PAHs)	mixture	0 - 0.1
Hydrogen Sulfide	7783-06-4	Trace

4. First aid measures

Eye contact	Cold product - Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops or persists. Hot product - Flood with water to dissipate heat. In the event of any product remaining, do not try to remove it other than by continued irrigation with water. Obtain medical attention immediately.
Skin contact	Cold Product - Wash contaminated skin with soap and water. Remove contaminated clothing and wash underlying skin as soon as reasonably practicable. Hot Product - Flood skin with cold water to dissipate heat, cover with clean cotton or gauze, obtain medical advice immediately.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. EXPOSURE TO HYDROGEN SULFIDE: Casualties suffering ill effects as a result of exposure to hydrogen sulfide should be immediately removed to fresh air and medical assistance obtained without delay.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. Inhalation of hydrogen sulfide may cause central respiratory depression leading to coma and death. It is irritant to the respiratory tract causing chemical pneumonitis and pulmonary edema. The onset of pulmonary edema may be delayed for 24 to 48 hours. Treat with oxygen and ventilate as appropriate. Administer broncho-dilators if indicated and consider administration of corticosteroids. Keep casualty under surveillance for 48 hours in case pulmonary edema develops.

5. Fire-fighting measures

Flammability of the product	Combustible liquid.
Auto-ignition temperature	250 to 537°C (482 to 998.6°F)
Flash point	Closed cup: >=60°C (>=140°F) [Pensky-Martens.]
Explosion limits	Lower: 0.5% Upper: 5%

Product name Fuel oil, residual	Product code SMI2111.	Page: 1/11
Version 1	Date of issue 06/27/2011.	Format US-COMP
	(US-COMP)	Language ENGLISH
		(ENGLISH)

Product name Fuel oil, residual	Product code SMI2111.	Page: 2/11
Version 1	Date of issue 06/27/2011.	Format US-COMP
	(US-COMP)	Language ENGLISH
		(ENGLISH)

Fire/explosion hazards In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Vapors can form explosive mixtures with air. Vapors are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Avoid spraying directly into storage containers because of the danger of boil-over. Boil-over is the rapid increase in volume caused by the presence of water in hot product and the subsequent overflow from a tank.

Extinguishing media

Suitable Use dry chemical, CO₂, water spray (fog) or foam.

Not suitable Do not use water jet.

Fire-fighting procedures Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous combustion products Combustion products may include the following:
carbon oxides (CO, CO₂) (carbon monoxide, carbon dioxide)
sulfur oxides (SO₂, SO₃ etc.)
Hydrogen Sulfide (H₂S)

Protective clothing (fire) Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Environmental precautions Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately.

Spillages in water or at sea:
Product less dense than water: In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, before working in the combustion/exhaust spaces of engines/boilers or before handling ash/dust produced by the combustion of product, the work area should be thoroughly dampened with water. This will help to minimize the amount of airborne contamination produced by the work activity. However, because of the risk of explosion, do not allow water to come into contact with hot ash/dust. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal. Product which is denser than water will sink to the bottom, and usually no intervention will be feasible. If possible, collect the product and contaminated materials with mechanical means, and store/dispose of according to relevant regulations. In special situations (to be assessed on case-by-case basis, according to expert judgment and local conditions), excavations of trenches on the bottom to collect the product with sand may be a feasible option.

Personal protection in case of a large spill Chemical splash goggles. Chemical-resistant protective suit. Boots. Chemical-resistant gloves. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Suggested protective clothing might not be adequate. Consult a specialist before handling this product. CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of air-purifying respirator.

This material can contain hydrogen sulfide (H₂S), a very toxic and extremely flammable gas. Entry into a confined space or poorly ventilated area contaminated with vapor, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained positive pressure breathing apparatus (SCBA).

Methods for cleaning up

Product name Fuel oil, residual	Product code SMI2111.	Page: 3/11	
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		(US-COMP)	(ENGLISH)

Large spill Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal. Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately.

Small spill Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling Put on appropriate personal protective equipment (see Section 8). Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

Storage Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10). Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Other information This material can contain hydrogen sulfide (H₂S), a very toxic and extremely flammable gas. Vapors containing hydrogen sulfide may accumulate during storage or transport and may also be vented during filling of tanks. Hydrogen sulfide has a typical "bad egg" smell but at high concentrations the sense of smell is rapidly lost, therefore do not rely on sense of smell for detecting hydrogen sulfide. Use specially designed measuring instruments for determining its concentration.

Light hydrocarbon vapors can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapor in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks.

Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures.

Entry to any tanks or other confined space requires a full risk assessment and appropriate control measures to be put in place in conformance with appropriate regulations and industry practice on confined space entry.

When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapor mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurized fuel pipes, the vapor or mists generated will create a flammability or explosion hazard.

Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name

Fuel oil, residual

Naphthalene

Occupational exposure limits

ACGIH TLV (United States).

TWA: 0.2 mg/m³, (Benzene-soluble)

ACGIH TLV (United States).

STEL: 79 mg/m³ 15 minute(s). Issued/Revised: 5/1996

STEL: 15 ppm 15 minute(s). Issued/Revised: 5/1996

TWA: 52 mg/m³ 8 hour(s). Issued/Revised: 5/1996

TWA: 10 ppm 8 hour(s). Issued/Revised: 5/1996

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Hydrogen Sulfide	<p>OSHA PEL (United States). TWA: 50 mg/m³ 8 hour(s). Issued/Revised: 6/1993 TWA: 10 ppm 8 hour(s). Issued/Revised: 6/1993</p> <p>ACGIH TLV (United States). STEL: 5 ppm 15 minute(s). Issued/Revised: 11/2009 TWA: 1 ppm 8 hour(s). Issued/Revised: 11/2009</p> <p>OSHA PEL Z2 (United States). AMP: 50 ppm 10 minute(s). Issued/Revised: 6/1993 CEIL: 20 ppm Issued/Revised: 6/1993</p>
Ethylbenzene	<p>ACGIH TLV (United States). STEL: 125 ppm 15 minute(s). Issued/Revised: 1/2002 TWA: 100 ppm 8 hour(s). Issued/Revised: 1/2002</p> <p>OSHA PEL (United States). TWA: 435 mg/m³ 8 hour(s). Issued/Revised: 6/1993 TWA: 100 ppm 8 hour(s). Issued/Revised: 6/1993</p>
Polycyclic aromatic hydrocarbons (PAHs)	<p>ACGIH TLV (United States). TWA: 0.2 mg/m³ 8 hour(s). Form: Benzene-soluble</p> <p>OSHA PEL (United States). TWA: 0.2 mg/m³ 8 hour(s). Form: Benzene-soluble</p>

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Some states may enforce more stringent exposure limits.

Control Measures Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Personal protection

Eyes Chemical splash goggles.

Skin and body Avoid contact with skin and clothing. Wear clothing and footwear that cannot be penetrated by chemicals or oil.
When handling hot material, wear heat resistant protective gloves, clothing and face shield that are able to withstand the temperature of the heated product.

Respiratory Use adequate ventilation. Do not breathe vapor or mist. If ventilation is inadequate, use respirator that will protect against organic vapor and dust/mist.
Air supplied respiratory protection should be worn whenever it is required for the worker's face to be within 3 feet of an open hatch. If operating conditions cause high vapor concentrations or the TLV is exceeded, use supplied-air respirator.

Hands Cold material: Wear chemical resistant gloves. Recommended: nitrile gloves.
Hot material: to prevent thermal burns wear heat resistant and impervious gauntlets/gloves.

The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Consult your supervisor or Standard Operating Procedure (S.O.P) for special handling instructions.

9. Physical and chemical properties

Physical state	Liquid.
Color	Dark Brown. / Black.
Odor	Oily
Flash point	Closed cup: >=60°C (>=140°F) [Pensky-Martens.]
Explosion limits	Lower: 0.5% Upper: 5%
Auto-ignition temperature	250 to 537°C (482 to 998.6°F)

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Density	1010 kg/m ³ (1.01 g/cm ³) at 15°C
Viscosity	Kinematic: 663.2 mm ² /s (663.2 cSt) at 40°C Kinematic: 180 to 700 mm ² /s (180 to 700 cSt) at 50°C
Boiling point / Range	164 to 750°C (327.2 to 1382°F)
Melting point / Range	<30°C (<86°F)
Vapor pressure	<0.133 kPa (<1 mm Hg) at 20°C
Vapor density	>0.9 [Air = 1]

10. Stability and reactivity

Stability and reactivity	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.
Incompatibility with various substances	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Test	Species	Result	Exposure	Remarks
Fuel oil, residual	LD50 Dermal	Rabbit	>2000 mg/kg	-	Based on Catalytic cracked clarified oil (CCCO)
	LD50 Dermal	Rabbit	>2000 mg/kg	-	Based on Heavy fuel oil
	LD50 Oral	Rat	5270 mg/kg	-	Based on Catalytic cracked clarified oil (CCCO)
	LD50 Oral	Rat	4320 mg/kg	-	Based on Catalytic cracked clarified oil (CCCO)
	LC50 Inhalation Dusts and mists	Rat	4500 mg/m ³	4 hours	Based on Carbon black oil
	LC50 Inhalation Dusts and mists	Rat	4100 mg/m ³	4 hours	Based on Carbon black oil

Irritation/Corrosion

Product/ingredient name	Species	Result	Score	Exposure	Observation	Conc.	Remarks
Fuel oil, residual	Rabbit	Skin - Non-irritant to skin.	-	-	-	-	Based on Heavy fuel oil
	Rabbit	Eyes - Non-irritating to the eyes.	-	-	-	-	Based on Heavy fuel oil

Conclusion/Summary Not available.

Sensitizer

Product/ingredient name	Route of exposure	Species	Result	Remarks
Fuel oil, residual	skin	Guinea pig	Not sensitizing	Based on Heavy fuel oil

Conclusion/Summary Not available.

Carcinogenicity

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Product/ingredient name	Test authority/Test number	Species	Route	Exposure	Result	Remarks
Fuel oil, residual	Equivalent to OECD 451	Mouse	Dermal	Lifetime	Positive - Dermal - Unspecified	Based on Catalytic cracked clarified oil (CCCO)

Conclusion/Summary May cause cancer

Classification

Product/ingredient name	IARC	NTP	OSHA
Naphthalene	2B	Possible	-
Fuel oil, residual	2B	-	-
Ethylbenzene	2B	-	-
Polycyclic aromatic hydrocarbons (PAHs)	-	Possible	-

IARC :
2B - Possible carcinogen to human.

NTP :
Possible - Reasonably anticipated to be human carcinogens.

Mutagenicity

Product/ingredient name	Test	Experiment	Result	Remarks
Fuel oil, residual	Equivalent to OECD 476	Experiment: In vitro Subject: Mammal - species unspecified	Positive	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 471	Experiment: In vitro Subject: Non-mammalian species	Positive	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 475	Experiment: In vivo Subject: Unspecified Cell: Germ	Negative	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 474	Experiment: In vivo Subject: Unspecified Cell: Germ	Negative	Based on Catalytic cracked clarified oil (CCCO)

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Result	Exposure	Remarks
Fuel oil, residual	-	Negative	-	Rat	Dermal	70 days no effects observed	Based on Catalytic cracked clarified oil (CCCO)
	-	-	Positive	Rat	Dermal	20 days Effects observed	Based on atmospheric residue

Conclusion/Summary Development: Suspected of damaging the unborn child.
Fertility: Based on available data, the classification criteria are not met.
Effects on or via lactation: Based on available data, the classification criteria are not met.

Other information PNA's / PAHs have been shown to produce tumors in lifetime skin-painting studies in mice. The significance of these findings to human health is not clear, but good industrial hygiene practice should be followed to prevent prolonged or repeated contact with this material.
A similar material produced skin tumors in laboratory animals. The International Agency for Research on Cancer has determined that similar materials such as residual (heavy) fuel oils are possibly carcinogenic to humans (Group 2B).

Twenty eight day and ninety day dermal toxicity studies with a similar material resulted in moderate skin irritation and adverse effects on the liver, thymus, thyroid, lung, spleen, bone marrow and blood.

Tests on a similar material indicate fetal toxicity, embryo/fetal lethality and maternal toxicity in pregnant laboratory animals with doses of 1 to 10 mg/kg/day throughout pregnancy.

A similar material was found to be mutagenic in "in vitro" and "in vivo" laboratory tests. The exact

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relationship between these results and possible human effects is not known.

Naphthalene has been reported to cause developmental toxicity in mice after oral exposure to relatively high dose levels, but developmental toxicity was not observed in NTP (National Toxicology Program) sponsored studies in rats and rabbits. Ingestion or inhalation of naphthalene can result in hemolysis and other blood abnormalities, and individuals (and infants) deficient in glucose-6-phosphate dehydrogenase may be especially susceptible to these effects. Inhalation of naphthalene may cause headache and nausea. Airborne exposure can result in eye irritation. Naphthalene exposure has been associated with cataracts in animals and humans.

Ethylbenzene: The National Toxicology Program (NTP) conducted a 13-week inhalation study with male and female rats and mice at exposure concentrations ranging from 100 to 1000 ppm ethylbenzene. No rats or mice died during the study. Kidney, liver, and lung weights were increased in the exposed rats, while weight increases were observed only in the livers of exposed mice. Treatment-related histopathologic changes were not observed in any tissues of rats and mice.

NTP also exposed male and female rats and mice by inhalation to 0, 75, 250, or 750 ppm ethylbenzene for 2 years. There was a statistically significant increase in the number of kidney tumors in male and female rats at 750 ppm. There were also increased incidences of lung tumors in male mice and liver tumors in female mice that were statistically significant at 750 ppm. Except for the male rat kidney tumors, the incidence of the tumors were within the range observed for non-exposed animals from other studies conducted by NTP. The significance of these findings to humans is unknown. Ethylbenzene is not genotoxic. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and found it to be possibly carcinogenic to humans (Group 2B).

Potential chronic health effects

Carcinogenicity Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.

Medical conditions aggravated by over-exposure Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

12. Ecological information

Ecotoxicity

Product/ingredient name	Test authority/Test number	Species	Type/Result	Exposure	Effects	Remarks
Fuel oil, residual	OECD 202	Daphnia	Acute EL50 2 mg/l Nominal Fresh water	48 hours	Mobility	Based on Heavy fuel oil
	OECD 203	Fish	Acute LL50 79 mg/l Nominal Fresh water	96 hours	-	Based on residual fuel oil
	Modeled data	Daphnia	Chronic NOEL 0.27 mg/l Nominal Fresh water	21 days	Reproduction	-
	Modeled data	Fish	Chronic NOEL 0.1 mg/l Nominal Fresh water	28 days	Mortality	-

Persistence/degradability IOPC Persistent / not persistent. oil: Persistent

Mobility Spillages may penetrate the soil causing ground water contamination. This material may accumulate in sediments.

Other ecological information This product has a density close to that of water. Spills are unlikely to form a distinct film on the water surface, and may become dispersed as globules if mixed or agitated. If released to water the product may sink.

13. Disposal considerations

Waste information

The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not

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been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

NOTE: The generator of waste has the responsibility for proper waste identification (based on characteristic(s) or listing), transportation and disposal

14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Class	Packing group	Additional information
DOT Classification	NA 1993	FUEL OIL	Combustible liquid.	III	Remarks Not regulated (if shipped by land in non-bulk packaging).
TDG Classification	Not regulated.	-	-	-	-
IMDG Classification	UN 3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil). Marine pollutant	9	III	Emergency schedules (EmS) F-A, S-F
IATA/ICAO Classification	UN 3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil)	9	III	-

15. Regulatory information

U.S. Federal Regulations

United States inventory (TSCA 8b)

All components are listed or exempted.

TSCA 12(b) one-time export: Naphthalene

SARA 302/304/311/312 extremely hazardous substances: Hydrogen Sulfide

SARA 302/304 emergency planning and notification: Hydrogen Sulfide

SARA 302/304/311/312 hazardous chemicals: Hydrogen Sulfide; Sulphur or Sulfur; Fuel oil, residual; Naphthalene

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Fuel oil, residual: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

SARA 313

Form R - Reporting requirements

Product name	CAS number	Concentration
Naphthalene	91-20-3	0.1 - 3
Hydrogen Sulfide	7783-06-4	Trace
Ethylbenzene	100-41-4	0.1 - 0.5
Polycyclic aromatic hydrocarbons (PAHs)	mixture	0 - 0.1

Supplier notification

Naphthalene	91-20-3	0.1 - 3
Hydrogen Sulfide	7783-06-4	Trace
Ethylbenzene	100-41-4	0.1 - 0.5
Polycyclic aromatic hydrocarbons (PAHs)	mixture	0 - 0.1

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):

CERCLA: Hazardous substances.: Hydrogen Sulfide: 100 lbs. (45.4 kg); Naphthalene: 100 lbs. (45.4 kg); Polycyclic aromatic hydrocarbons (PAHs): 1 lb. (0.454 kg); Ethylbenzene: 1000 lbs. (454 kg);

State regulations

Massachusetts Substances

The following components are listed: NAPHTHALENE; SULFUR; HYDROGEN SULFIDE

New Jersey Hazardous Substances

The following components are listed: NAPHTHALENE; MOTH FLAKES; FUEL OIL; SULFUR; HYDROGEN SULFIDE; ETHYL BENZENE; BENZENE, ETHYL-; Polycyclic aromatic hydrocarbons (PAHs)

Pennsylvania RTK Hazardous Substances

The following components are listed: NAPHTHALENE; SULFUR; HYDROGEN SULFIDE (H2S); BENZENE, ETHYL-; Polycyclic aromatic hydrocarbons (PAHs)

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer. Naphthalene; Ethylbenzene

Other regulations

Canada inventory

All components are listed or exempted.

REACH Status

The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

Australia inventory (AICS)

All components are listed or exempted.

China inventory (IECSC)

All components are listed or exempted.

Japan inventory (ENCS)

All components are listed or exempted.

Korea inventory (KECI)

Not determined.

Philippines inventory (PICCS)

Not determined.

16. Other information

Label requirements

WARNING !

COMBUSTIBLE LIQUID AND VAPOR.
HARMFUL IF SWALLOWED.
INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS.
HARMFUL ON PROLONGED OR REPEATED INHALATION.
VAPOR MAY CONTAIN HYDROGEN SULFIDE (H2S) GAS WHICH CAN BE HARMFUL OR FATAL IF INHALED.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.
SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
HEATED MATERIAL CAN CAUSE THERMAL BURNS.

HMIS® Rating :

Health * 2
Flammability 2
Physical Hazard 0
Personal protection X

National Fire Protection Association (U.S.A.)



History

Date of issue

06/27/2011.

Date of previous issue

No previous validation.

Prepared by

Product Stewardship

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from us.

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It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken.

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MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

**EMERGENCY OVERVIEW
DANGER!****EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF
SWALLOWED - ASPIRATION HAZARD**

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATIONHess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961**EMERGENCY TELEPHONE NUMBER (24 hrs):****COMPANY CONTACT (business hours):****MSDS (Environment, Health, Safety) Internet Website****CHEMTREC (800)424-9300**

Corporate Safety (732)750-6000

www.hess.com

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS *

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION**EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.**CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES**EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES**FLAMMABLE PROPERTIES:**

FLASH POINT: -45 °F (-43°C)
 AUTOIGNITION TEMPERATURE: highly variable; > 530 °F (>280 °C)
 OSHA/NFPA FLAMMABILITY CLASS: 1A (flammable liquid)
 LOWER EXPLOSIVE LIMIT (%): 1.4%
 UPPER EXPLOSIVE LIMIT (%): 7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE**HANDLING PRECAUTIONS**

*****USE ONLY AS A MOTOR FUEL*****

*****DO NOT SIPHON BY MOUTH*****

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

8. EXPOSURE CONTROLS and PERSONAL PROTECTION**EXPOSURE LIMITS**

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	Skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50	--	A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200	--	Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	20	--	A4	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES**APPEARANCE**

A translucent, straw-colored or light yellow liquid



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ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H ₂ O = 1):	0.70 - 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H ₂ O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitroresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES**ACUTE TOXICITY**

Acute Dermal LD50 (rabbits): > 5 ml/kg	Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating	Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative	

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

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This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Gasoline
 DOT HAZARD CLASS and PACKING GROUP: 3, PG II
 DOT IDENTIFICATION NUMBER: UN 1203
 DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:

**15. REGULATORY INFORMATION****U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION**

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3



MATERIAL SAFETY DATA SHEET

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n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following de minimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
 Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING

HEALTH:	1	Slight
FIRE:	3	Serious
REACTIVITY:	0	Minimal

HMIS® HAZARD RATING

HEALTH:	1 *	Slight
FIRE:	3	Serious
PHYSICAL:	0	Minimal

* CHRONIC

SUPERSEDES MSDS DATED: 07/01/06

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
 N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
ANSI	American National Standards Institute (212)642-4900	[General Info: (800)467-4922]	
EPA	U.S. Environmental Protection Agency		
API	American Petroleum Institute (202)682-8000	HMIS	Hazardous Materials Information System



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

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IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



Material Safety Data Sheet

Catalog Number: 901411
Revision date: 26-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 901411

Product name: CORN GROUND YELLOW

Supplier:
MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
CORN GROUND YELLOW	N/A	90 - 100%	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: May cause skin irritation and/or dermatitis

Principle routes of exposure: Skin
Inhalation: May cause irritation of respiratory tract
Ingestion: May be harmful if swallowed.
Skin contact: May cause allergic skin reaction
Eye contact: Avoid contact with eyes

Statements of hazard MAY CAUSE ALLERGIC SKIN REACTION.
Statement of Spill or Leak - ANSI Label Eliminate all ignition sources. Absorb and/or contain spill with inert materials (e.g., sand, vermiculite). Then place in appropriate container. For large spills, use water spray to disperse vapors, flush spill area. Prevent runoff from entering waterways or sewers.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Inhalation: Move to fresh air. Call a physician immediately.
Skin contact: Rinse immediately with plenty of water and seek medical advice
Ingestion: Do not induce vomiting without medical advice.
Eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Protection of first-aiders: No information available
Medical conditions aggravated by exposure: None known

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Use dry chemical, CO2, water spray or "alcohol" foam
Specific hazards: Burning produces irritant fumes.
Unusual hazards: None known
Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Specific methods: Water mist may be used to cool closed containers.
Flash point: Not determined
Autoignition temperature: Not determined
NFPA rating:

NFPA Health:	1
NFPA Flammability:	1
NFPA Reactivity:	0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment.
Environmental precautions: Prevent product from entering drains.
Methods for cleaning up: Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Storage:
ROOM TEMPERATURE

Handling: Use only in area provided with appropriate exhaust ventilation.
Safe handling advice: Wear personal protective equipment.
Incompatible products: Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory protection: Breathing apparatus only if aerosol or dust is formed.
Hand protection: Pvc or other plastic material gloves
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect.
Eye protection: Safety glasses with side-shields
Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.



9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid
Formula: Not applicable
Melting point/range: No data available at this time.
Boiling point/range: No Data available at this time.
Density: No data available
Vapor pressure: No data available
Evaporation rate: No data available
Vapor density: No data available

Solubility (in water): No data available
 Flash point: Not determined
 Autoignition temperature: Not determined

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage conditions.
Polymerization: None under normal processing.
Hazardous decomposition products: Thermal decomposition can lead to release of irritating gases and vapours such as carbon oxides.
Materials to avoid: Strong oxidising agents
Conditions to avoid: Exposure to air or moisture over prolonged periods.

11. TOXICOLOGICAL INFORMATION

Product Information

Acute toxicity
 Components
 CORN GROUND YELLOW
RTECS Number: Not Available
Selected LD50s and LC50s
 Not Determined

Chronic toxicity: Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects: May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation: No data is available on the product itself.
Carcinogenic effects: No data is available on the product itself.
Mutagenic effects: No data is available on the product itself.
Reproductive toxicity: No data is available on the product itself.

12. ECOLOGICAL INFORMATION

Mobility: No data available
Bioaccumulation: No data available
Ecotoxicity effects: No data available
Aquatic toxicity: May cause long-term adverse effects in the aquatic environment.

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
CORN GROUND YELLOW	Not Listed	Not Listed	Not Listed
Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
CORN GROUND YELLOW	Not Listed	Not Listed	Not Listed
Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
CORN GROUND YELLOW	Not Listed	Not Listed	Not Listed
Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
CORN GROUND YELLOW	Not Listed	Not Listed	Not Listed

Components
 CORN GROUND YELLOW
California - Priority Toxic Pollutants
 Not Listed
California - Priority Toxic Pollutants
 Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.
Contaminated packaging: Do not re-use empty containers

14. TRANSPORT INFORMATION

UN/Id No: Not regulated
DOT:
Proper shipping name: Not Regulated

Components
 CORN GROUND YELLOW
U.S. DOT - Appendix A Table 1 - Reportable Quantities
 Not Listed

TDG (Canada):
WHMIS hazard class: Non-controlled

IMDG/IMO

IMDG - Hazard Classifications Not Applicable
 Components
 CORN GROUND YELLOW
U.S. DOT - Appendix B - Marine Pollutan Not Listed
U.S. DOT - Appendix B - Severe Marine Pollutants Not Listed

IMO-labels:

15. REGULATORY INFORMATION

International Inventories

Components
 CORN GROUND YELLOW
Inventory - United States TSCA - Sect. 8(b) Not Listed
Canada DSL Inventory List - Not Listed

U.S. regulations:
Components
 CORN GROUND YELLOW
California Proposition 65 Not Listed
Massachusetts Right to Know List: Not Listed
New Jersey Right to Know List: Not Listed
Pennsylvania Right to Know List: Not Listed

MP Biomedicals, LLC

www.mpbio.com

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
CORN GROUND YELLOW	Not Listed	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
CORN GROUND YELLOW	Not Listed	Not Listed	None	None

SARA 313 Notification: The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

State Notification: The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety

Disclaimer: The information and recommendations contained herein are based upon tests believed to be reliable. However, MP Biomedicals does not guarantee the accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage maybe required. MP Biomedicals assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet



Safety Data Sheet

Material Name: Iron Ore

*** Section 1 - Product and Company Identification ***

Manufacturer Information

CALPORTLAND COMPANY
2025 E. Financial Way
Glendora, CA 91741
Phone: 626-852-6200
www.calportland.com

*** Section 2 - Hazards Identification ***

GHS Classification:

Skin Corrosion/Irritation - Category 2
Eye Damage/Irritation - Category 2B
Carcinogenicity - Category 2
Specific Target Organ Toxicity Single Exposure - Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

Warning

Hazard Statements

Causes skin irritation.
Causes eye irritation.
Suspected of causing cancer.
May cause respiratory irritation.

Precautionary Statements

Prevention

Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
Avoid breathing dust.
Use only outdoors or in a well-ventilated area.

Safety Data Sheet

Material Name: Iron Ore

Response

If on skin: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.

Storage

Store in an appropriate container or containment structure.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

*** Section 3 - Composition / Information on Ingredients ***

CAS #	Component	Percent
1309-37-1	Iron oxide (Fe ₂ O ₃)	>85
1317-61-9	Ferric oxide black	15

Component Information/Information on Non-Hazardous Components

General Product Information

Trace Elements: These materials are mined from the earth. Trace amounts of naturally occurring elements might be detected during chemical analysis of these materials.

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact, do not rub or scratch your eyes. If eye contact occurs immediately flush eyes with copious amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.

First Aid: Skin

Flush exposed skin with copious amounts of water for at least 15 minutes depending on concentration, amount and duration of exposure. Wash with mild soap and water. Immediately remove all contaminated clothing, including footwear. Call physician if irritation persists.

First Aid: Ingestion

Do not induce vomiting. If conscious give person 1 to 2 glasses of water. If vomiting occurs spontaneously, lower head to avoid aspiration into lungs. Seek medical attention immediately.

First Aid: Inhalation

Remove to fresh air. Allow the victim to rest in a well-ventilated area. Seek medical help if coughing and other symptoms do not subside.

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

See Section 9 for Flammability Properties.
None

Safety Data Sheet

Material Name: Iron Ore

Hazardous Combustion Products

None

Extinguishing Media

Use appropriate extinguishing media for surrounding fire.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

*** Section 6 - Accidental Release Measures ***

Recovery and Neutralization

Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Dust could contain free crystalline silica. Wear appropriate personal protective equipment as described in Section 8.

Materials and Methods for Clean-Up

Use water/wet methods whenever mixing materials or cleaning up a spill of the material.

Emergency Measures

Isolate area. Keep unnecessary personnel away.

Personal Precautions and Protective Equipment

Wear appropriate protective equipment and clothing during clean-up.

Environmental Precautions

None

Prevention of Secondary Hazards

None

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid dust contact with eyes. Wear the appropriate eye protection against dust. Minimize dust generation and accumulation. Avoid breathing dust. Wear the appropriate respiratory protection against dust in poorly ventilated areas and if TLV is exceeded. Use good safety and industrial hygiene practices.

Storage Procedures

Store in a ventilated area away from sources of heat, moisture and incompatible materials.

Incompatibilities

None.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

Iron oxide (Fe₂O₃) (1309-37-1)

ACGIH: 5 mg/m³ TWA (respirable fraction)

OSHA: 10 mg/m³ TWA (fume)

NIOSH: 5 mg/m³ TWA (dust and fume, as Fe)

Engineering Measures

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Safety Data Sheet

Material Name: Iron Ore

Personal Protective Equipment: Respiratory

Avoid actions that cause dust exposure to occur. Use local or general ventilation to control exposures below applicable exposure limits. NIOSH or MSHA approved particulate filter respirators should be used in the context of respiratory protection program meeting the requirements of the OSHA respiratory protection standard [29 CFR 1910.134] to control exposures when ventilation or other controls are inadequate or discomfort or irritation is experienced. Respirator and/or filter cartridge selection should be based on American National Standards Institute (ANSI) Standards Z88.2 Practices for Respiratory Protection.

Personal Protective Equipment: Hands

Where prolonged exposure to products might occur, wear impervious gloves to eliminate skin contact.

Personal Protective Equipment: Eyes

When engaged in activities where ingredients could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with ingredients.

Personal Protective Equipment: Skin and Body

Normal work clothing (long sleeved shirts and long pants) is recommended.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Red to Black Granular

Physical State: Solid/Powder

Vapor Pressure: Not Applicable

Boiling Point: Not Applicable

Solubility (H₂O): Negligible

Evaporation Rate: Not Applicable

Octanol/H₂O Coeff.: Not Applicable

Flash Point Method: Not Applicable

Odor: No Odor

pH: Not Applicable

Vapor Density: Not Applicable

Melting Point: Not Applicable

Specific Gravity: Not Determined

VOC: Not Applicable

Flash Point: None

Upper Flammability Limit

(UFL):

Burning Rate: None

Lower Flammability Limit

(LFL):

Auto Ignition: None

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable in dry air but readily oxidizes in moist air forming rust.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Contact with incompatibles.

Incompatible Products

None.

Hazardous Decomposition Products

None.

Safety Data Sheet

Material Name: Iron Ore

*** Section 11 - Toxicological Information ***

Acute Toxicity

Component Analysis - LD50/LC50

Iron oxide (Fe₂O₃) (1309-37-1)

Oral LD50 Rat >10000 mg/kg

Ferric oxide black (1317-61-9)

Oral LD50 Rat >10000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Exposure to granular material could cause skin abrasion.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Dust can cause mechanical irritation of eyes. Possible destruction of eye tissue if dust is not washed from the eye.

Potential Health Effects: Ingestion

Ingestion of large amounts may cause gastrointestinal harm.

Potential Health Effects: Inhalation

Exposure to dust generated during the handling or use of the product may irritate eyes, skin, nose, throat and upper respiratory tract.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any sensitization effects.

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

B: Component Carcinogenicity

Iron oxide (Fe₂O₃) (1309-37-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Supplement 7 [1987]; Monograph 1 [1972] (Group 3 (not classifiable))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any single exposure specific target organ toxicity effects.

Specified Target Organ General Toxicity: Repeated Exposure

May cause respiratory irritation.

Aspiration Respiratory Organs Hazard

This product is not reported to have any aspiration hazard effects.

Safety Data Sheet

Material Name: Iron Ore

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

This product is not reported to have any ecotoxicity effects.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Persistence/Degradability

No information available for the product.

Bioaccumulation

No information available for the product.

Mobility in Soil

No information available for the product.

*** Section 13 - Disposal Considerations ***

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

*** Section 14 - Transportation Information ***

DOT Information

Shipping Name: Not Regulated

*** Section 15 - Regulatory Information ***

Regulatory Information

US Federal Regulations

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Iron oxide (Fe ₂ O ₃)	1309-37-1	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.

Safety Data Sheet

Material Name: Iron Ore

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Iron oxide (Fe ₂ O ₃)	1309-37-1	1 %

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Iron oxide (Fe ₂ O ₃)	1309-37-1	Yes	DSL	EINECS
Ferric oxide black	1317-61-9	Yes	DSL	EINECS

***** Section 16 - Other Information *****

Hazardous Material Information System (HMIS):	Health	1
	Flammability	0
	Physical Hazard	0
	Personal Protection	

NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

Protective Equipment: Safety glasses, gloves

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

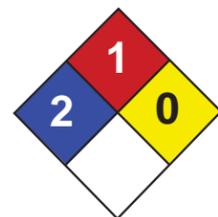
Safety Data Sheet

Material Name: Iron Ore

Other Information

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CALPORTLAND, except that the product shall conform to contracted specifications. The information provided herein was believed by CalPortland Company to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for nondelivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

End of Sheet



Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet Melamine MSDS

Section 1: Chemical Product and Company Identification

Product Name: Melamine	Contact Information:
Catalog Codes: SLM3256	Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396
CAS#: 108-78-1	US Sales: 1-800-901-7247 International Sales: 1-281-441-4400
RTECS: OS0700000	Order Online: ScienceLab.com
TSCA: TSCA 8(b) inventory: Melamine	CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
CI#: Not available.	International CHEMTREC, call: 1-703-527-3887
Synonym: 2,4,6-Triamino-s-Triazine; Isomelami;ne	For non-emergency assistance, call: 1-281-441-4400
Chemical Name: Melamine	
Chemical Formula: C3-H6-N6	

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Melamine	108-78-1	100

Toxicological Data on Ingredients: Melamine: ORAL (LD50): Acute: 3161 mg/kg [Rat]. 3296 mg/kg [Mouse]. DERMAL (LD50): Acute: >1000 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant).

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Classified 3 (Equivocal evidence.) by NTP. 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: CLOSED CUP: Higher than 93.3°C (200°F).

Flammable Limits: Not available.

Products of Combustion:

These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...), cyanide fumes, irritating and toxic fumes and gases.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 126.12 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: <250°C (482°F)

Critical Temperature: Not available.

Specific Gravity: 1.573 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 4.34 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Partially soluble in cold water. Insoluble in diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Dust generation, excess heat, incompatible materials.

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Not available.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:

Acute oral toxicity (LD50): 3161 mg/kg [Rat]. Acute dermal toxicity (LD50): >1000 mg/kg [Rabbit].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 3 (Equivocal evidence.) by NTP. 3 (Not classifiable for human.) by IARC.

MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fertility, fetotoxicity), and may affect genetic material based on animal data. May also be tumorigenic (carcinogenic) based on animal data.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritation. Inhalation: May cause irritation of the respiratory tract and affect respiration. May affect behavior and sense organs, liver and blood. Ingestion: May cause irritation of the digestive tract with nausea, vomiting and diarrhea. May affect the urinary system.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: Melamine Massachusetts RTK: Melamine New Jersey: Melamine TSCA 8(b) inventory: Melamine

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

R36/37/38- Irritating to eyes, respiratory system and skin. S24/25- Avoid contact with skin and eyes. S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 06:04 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet

U.S. Department of Labor

May be used to comply with
 OSHA's Hazard Communications Standard
 29 CFR 1910.1200. Standards must be
 consulted for specific requirements.
 IDENTITY (As Used on Label and List

Occupational Safety and Health Administration
 (Non-Mandatory Form)
 Form Approved
 OMB No. 1218-0072

Soybean Meal

Note:

Section I

Manufacturer's Name CHS	Emergency Telephone Numbe (507)625-7915
Address(Number, Street, City, State, & Zip Code) P.O. Box 3247	Telephone Number for Informatior (507)345-2209
2020 South Riverfront Drive	Date Prepared October 13, 2003
Mankato, MN 56001	Signature of Preparer (optional)

Section II -- Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Soybean Meal		OSHA	15 mg/m³	100

CAS # 68308-36-1

NFPA Hazard Classification

Health (Blue)	0
Flammability (Red)	0
Reactivity (Yellow)	0

Section III -- Physical/Chemical Characteristics

Boiling Point Not Available	Specific Gravity (H ₂ O = 1) Not Available
Vapor Pressure (mm Hg) Not Available	Melting Point Not Available
Vapor Density (AIR = 1) Not Available	Evaporation Rate (Butyl Acetate = 1) Not Available
Solubility In Water Not Available	
Appearance and Odor Off-White to Cream (Flour) Light Brown/Tan (Meal)	

Section IV -- Fire and Explosion Hazard Data

Flash Point (Method Used) Not Available	Flammable Limits Not Available	LEL Not Avail.	UEL Not Avail.
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Extinguishing Media Sand, Dry Chemical, Water Mist:
Special Fire Fighting Procedures None

Unusual Fire and Explosion Hazards None

Section V -- Reactivity Data

Stability	Unstable	Conditions to Avoid	Not Applicable
	Stable Yes		

Incompatibility (Materials to Avoid)	
Hazardous Decomposition of Byproducts	

Hazardous Polymerization	May Occur	Conditions to Avoid	Not Applicable
	Will Not Occur	X	

Section VI -- Health Hazard Data

Route(s) of Entry:	Inhalation ? Yes	Skin ? No	Ingestion ? Yes
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Health Hazards (Acute and Chronic):
Ingestion: None, material is a food.

Inhalation: If dust levels exceed 15 mg/m³, dust masks should be worn.

Carcinogenicity:	NTP? No	IARC Monographs?	OSHA Regulated?
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Signs and Symptoms of Exposure	Not Applicable
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Medical Conditions	High dust exposure should be avoided by individuals with pulmonary disorders.
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Emergency and First Aid Procedures	Eyes: Flush with water/saline followed by appropriate medical care as needed.
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Section VII -- Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spiller	No specific hazards; material is non-hazardous; if dust levels exceed 15 mg/m³, a dust mask is advisable.
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Waste Disposal Method	Non-contaminated waste material can be disposed of as non-hazardous solid waste.
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Precautions to be Taken in Handling and Storin	Avoid open flames or other ignition sources (i.e., electrical equipment; switch gear).
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Other Precautions	None
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VIII -- Control Measures

Respiratory Protection (Specify Type)	Dust mask if levels exceed 15 mg/m³		
Ventilation	Local Exhaust	Special	Not Applicable
	Mechanical (General)	Other	Not Applicable

Protective Gloves	Not Applicable	Eye Protection	Safety Glasses
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Other Protective Clothing or Equipmen	Not Applicable
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Work/Hygienic Practices	Not Applicable
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MATERIAL SAFETY DATA SHEET
Muriate of Potash

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Muriate of Potash (MOP), all grades
Chemical Name:	Potassium Chloride
Chemical Family:	Inorganic Salt
Synonyms:	Potash; MOP; Potassium Chloride; Potassium Muriate; Potassium Monochloride
Chemical Formula:	KCl
Primary Use:	Crop nutrient; Industrial applications
Responsible Party:	Mosaic USA 100 South Saunders Road, Suite 300 Lake Forest, Illinois 60045
Non-Emergency Technical Contact:	8:00am – 4:00pm Central Time, Mon – Fri: 800-323-5523 or 847-739-1200

EMERGENCY OVERVIEW			
24 Hour Emergency Telephone Number: For Chemical Emergencies: Spill, Leak, Fire or Accident Call CHEMTREC North America: (800)424-9300 Others: (703)527-3887 (collect)			
Health Hazards:	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Potassium chloride is generally recognized as safe (GRAS) when used in accordance with good manufacturing practice.		
Physical Hazards:	None expected		
Physical Form:	Solid		
Appearance:	White to reddish-brown, crystalline or granular		
Odor:	None		
NFPA HAZARD CLASS		HMIS HAZARD CLASS	
Health:	1 (Slight)	Health:	1 (Slight)
Flammability:	0 (Least)	Flammability:	0 (Least)
Instability:	0 (Least)	Physical Hazard:	0 (Least)
Special Hazard:	None		



MATERIAL SAFETY DATA SHEET
Muriate of Potash

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	% Weight	Exposure Guideline		
		Limits	Agency	Type
Potassium Chloride CAS No. 7447-40-7	95 – 99.5	NE	OSHA ACGIH	All All
Sodium Chloride CAS No. 7647-14-5	0.3 – 3.7	NE	OSHA ACGIH	All All
Calcium and Magnesium Chlorides and Sulfates CAS No. Various	0.2 – 1.3	NE	OSHA ACGIH	All All

NE = Not established, but the following particulate limits apply to all inert inorganic dusts.

Particulates Not Otherwise Classified (PNOC)	10 mg/m ³ 3 mg/m ³	ACGIH	TWA – Inhalable TWA - Respirable
Particulates Not Otherwise Regulated (PNOR)	15 mg/m ³ 5 mg/m ³	OSHA	TWA – Total Dust TWA - Respirable

Notes:

State, local or other agencies or advisory groups may have published more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.



MATERIAL SAFETY DATA SHEET
Muriate of Potash

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS	
Eye:	Contact may cause mild eye irritation including stinging, watering and redness.
Skin:	Contact may cause mild irritation including redness and a burning sensation. No information available on skin absorption.
Inhalation (Breathing):	No information available.
Ingestion (Swallowing):	Low to moderate degree of toxicity by ingestion.
Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, abdominal cramping, irregular heartbeats (arrhythmias), dehydration, and hypertension. Repeated overexposure to dusts may result in irritation of the respiratory tract, coughing and shortness of breath.
Cancer:	Inadequate data available to evaluate the cancer hazard of this material.
Target Organs:	No data available.
Developmental:	Inadequate data available for this material.
Other Comments:	None
Pre-Existing Medical Conditions:	Conditions aggravated by exposure may include kidney disorders and high blood pressure (hypertension)..



MATERIAL SAFETY DATA SHEET
Muriate of Potash

4. FIRST AID MEASURES

Eye:	If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.
Skin:	Clense affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.
Inhalation (Breathing):	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
Ingestion (Swallowing):	If large amounts are swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestion of large amounts (more than 5 ounces or a little more than 1/2 cup in an adult) preferably under direction from a physician or poison center. If possible, do not leave victim unattended and observe closely for adequacy of breathing.
Note to Physicians:	No information found.

5. FIRE FIGHTING MEASURES

Flammable Properties:	This product is non-flammable. Flash Point— Not applicable OSHA Flammability Class— Not applicable LEL/UEL— Not applicable Autoignition Temperature— Not applicable
Unusual Fire & Explosion Hazards:	No unusual fire or explosion hazards are expected. When this material is subjected to high temperatures, it may release small amounts of chloride gas.
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire.
Fire Fighting Instructions:	Positive pressure, self-contained breathing apparatus is required for all fire fighting activities involving hazardous materials. Full structural fire fighting (bunker) gear is the minimum acceptable attire. The need for proximity, entry, flashover and/or special chemical protective clothing (see Section 8) needs to be determined for each incident by a competent fire fighting safety professional. Water used for fire suppression and cooling may become contaminated. Discharge to sewer system(s) or the environment may be restricted, requiring containment and proper disposal of water (see Section 6).



MATERIAL SAFETY DATA SHEET
Muriate of Potash

6. ACCIDENTAL RELEASE MEASURES

- Muriate of Potash is a crop nutrient and plant food, however, large spills can harm or kill vegetation.
- Stay upwind and away from spill (dust hazard).
 - Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).
 - Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways.
 - Notify appropriate federal, state, and local agencies as may be required (see Section 13).
 - Minimize dust generation.
 - Sweep up and package appropriately for disposal.

7. HANDLING AND STORAGE

Handling:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8). Wash thoroughly after handling. Wash contaminated clothing. Use good personal hygiene practice.
Storage:	Keep container(s) tightly closed. When possible use and store this material in cool, dry, well ventilated areas. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.
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Personal Protective Equipment (PPE)

Respiratory:	A NIOSH approved air purifying respirator with a type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2). Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed if workplace conditions warrant a respirator.
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MATERIAL SAFETY DATA SHEET
Muriate of Potash

Personal Protective Equipment (PPE)

Skin:	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption (see glove manufacturer literature for information on permeability).
Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.
Other PPE:	A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Flash Point:	Not applicable
Flammable/Explosive Limits (%):	LEL/UEL— Not applicable
Autoignition Temperature:	Not applicable
Appearance:	White to reddish-brown, crystalline or granular
Physical State:	Solid
Odor/Taste:	None / Strong saline
Molecular Weight of Pure Material:	KCl – 74.6; NaCl – 58.5
pH:	5.4 – 10.0 in a 5% solution
Vapor Pressure (mm Hg):	Approximately zero
Vapor Density (air=1):	2.57
Boiling Point:	Sublimes at 1,500°C (2,732°F)
Freezing/Melting Point:	772 to 776°C (1423 to 1428°F)
Solubility in Water:	99.5 – 99.999%; 34.2 g/100mL at 20°C
Specific Gravity:	1.986 – 1.990
Volatility:	No data available
Bulk Density:	Loose – 64 to 75 lbs/ft ³ (1025 to 1200 kg/m ³)



MATERIAL SAFETY DATA SHEET
Muriate of Potash

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of storage and handling. Material is hygroscopic (May absorb moisture from air when relative humidity > 72%).
Conditions to Avoid:	None known
Incompatible Materials:	Avoid contact with hot nitric acid, may cause evolution of toxic nitrosyl chloride. Contact with other strong acids may produce irritating hydrogen chloride gas. KCl may react violently with bromine trifluoride and may explode if mixed with potassium permanganate and sulfuric acid. NaCl can react with most noble metals, such as iron or steel, building materials (such as cement), bromine, or trifluoride. A potentially explosive reaction may occur if NaCl is mixed with dichloromaleic anhydride and urea. Electrolysis of mixtures containing NaCl and nitrogen compounds may form explosive nitrogen trichloride.
Corrosivity:	Similar to salt. Mildly corrosive to metals in the presence of moisture.
Hazardous Decomposition Products:	None known
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

Potassium Chloride:	LD50 (rat, oral) = 2.6 g/kg LC50: no information available Eye (rabbit): 500 mg/24 H, mild irritant Inadequate carcinogenicity, mutagenicity, or developmental toxicity data located for potassium chloride. No target organ data located for potassium chloride	LD50 (mouse, oral) = 1.5 g/kg
Sodium Chloride:	LD50 (rat, oral) = 3 g/kg; LD50 (mouse, oral) = 4 g/kg LC50 (rat) > 42 g/m ³ / 1hour Eye (rabbit): 100 mg/24 hour, moderate irritant Eye (rabbit): 500 mg/24 hour, mild irritant Inadequate carcinogenicity, mutagenicity, or developmental toxicity data located for sodium chloride. No target organ data located for sodium chloride	



MATERIAL SAFETY DATA SHEET
Muriate of Potash

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Dissolution of large quantities of potassium chloride and sodium chloride in water may create an elevated level of salinity that may be harmful to fresh water aquatic species and to plants that are not salt-tolerant. Potassium Chloride: Lepomis macrochirus LC50 – 2010 mg/l Physa heterostrophia LC50 – 940 mg/l Scenedesmus subspicatus EC50 – 2500 mg/l Sodium Chloride: Ceriodaphnia dubia LC50 – 280,000 – 3,540,000 ug/l Daphnia magna LC50 – 3,114,000 – 10,000,000 ug/l Daphnia pulex EC50 – 56.40 mM Pimephales promelas LD50 – 6,020,000 – 10,000,000 ug/l
BOD and COD:	No data found

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not an RCRA "listed" or "characteristic" hazardous waste. Contamination may subject it to hazardous waste regulations. Properly characterize all waste materials. Consult state and local regulations regarding the proper disposal of this material.

14. TRANSPORT INFORMATION

Hazard Class or Division:	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) regulations in Canada.
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MATERIAL SAFETY DATA SHEET
Muriate of Potash

15. REGULATORY INFORMATION

FDA:	1. Potassium Chloride used as a dietary supplement in food for human consumption is generally recognized as safe (GRAS) when used in accordance with good manufacturing practice [21 CFR 182.5622]. 2. Substance added directly to human food affirmed as GRAS [21 CFR 184.1622].
CERCLA:	Not listed
RCRA 261.33:	Not listed
SARA Title III:	SARA 302: RQ: No; TPQ: No SARA 311/312: Acute: No; Chronic: No; Fire: No; Pressure: No; Reactivity: No – Exemptions at 40 CFR, Part 370 may apply for agricultural use, or quantities of less than 10,000 pounds on-site. SARA 313 List: No
TSCA:	8(b) Chemical Inventory: Yes; TSCA 8(d): No
Proposition 65: (CA Health & Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL:	Yes
Canada NDSL:	No
WHMIS:	Not controlled

16. OTHER INFORMATION

The information in this document is believed to be correct as of the date issued. **HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.** This information and product are furnished on the condition that the person receiving them shall make his own determination as to suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

MATERIAL SAFETY DATA SHEET (MSDS) FOR PORTLAND CEMENT

(Complies with OSHA and MSHA Hazard Communication Standards,
29 CFR 1910.1200 and 30 CFR Part 47)



CEMEX, INC.
CEMEX CALIFORNIA CEMENT LLC
VICTORVILLE CEMENT PLANT
16888 NORTH "E" STREET
VICTORVILLE, CALIFORNIA 92394-2999

Section 1 - IDENTIFICATION

Supplier/Manufacturer

CEMEX, Inc.
CEMEX California Cement LLC
Victorville Cement Plant
16888 North "E" Street
Victorville, California 92394-2999

Emergency Contact Information

(619) 381-7600

Chemical name and synonyms

Portland Cement (CAS #65997-15-1)

Product name

"CEMEX Type I/II"
"CEMEX Type III"
"CEMEX Type II/V"
"CEMEX Type V"
"CEMEX Block"
"CEMEX Class G"

Chemical family

Calcium salts.

Formula

3CaO.SiO ₂	(CAS #12168-85-3)
2CaO.SiO ₂	(CAS #10034-77-2)
3CaO.Al ₂ O ₃	(CAS #12042-78-3)
4CaO..Al ₂ O ₃ Fe ₂ O ₃	(CAS #12068-35-8)
CaSO ₂ .2H ₂ O	(CAS #13397-24-5)

Other salts:

Small amounts of MgO, and trace amounts of K₂SO₄ and Na₂SO₄ may also be present.

Section 2 - COMPONENTS

Hazardous Ingredients

Portland cement clinker (CAS# 65997-15- 1) - approximately - 93.5-96.0 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/m³
OSHA PEL (8-hour TWA) = 50 million particles/ft³

Gypsum (CAS# 7778-18-9) - approximately - 4.0-6.5 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/m³
OSHA PEL (8-hour TWA) = 15 mg total dust/m³
OSHA PEL (8-hour TWA) = 5 mg respirable dust/m³

Respirable quartz (CAS# 14808-60-7) – greater than 0.1% by weight
ACGIH TLV-TWA (2000) = 0.05 mg respirable quartz dust/m³
OSHA PEL (8-hour TWA) = (10 mg respirable dust/m³)/(percent silica + 2)

Trace Ingredients

Trace amounts of naturally occurring chemicals might be detected during chemical analysis. Trace constituents may include up to 0.75% insoluble residue, some of which may be free crystalline silica, calcium oxide (Also known as lime or quick lime), magnesium oxide, potassium sulfate, sodium sulfate, chromium compounds, and nickel compounds.

Section 3 - HAZARD IDENTIFICATION

Emergency Overview

Portland cement is a light gray powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet portland cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry portland cement.

Potential Health Effects

Relevant Routes of Exposure:

Eye contact, skin contact, inhalation, and ingestion.

Effects Resulting from Eye Contact:

Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by large amounts of dry powder or splashes of wet portland cement may cause effects ranging from moderate eye irritation to chemical burns or blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

Effects Resulting from Skin Contact:

Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Dry portland cement contacting wet skin or exposure to moist or wet portland cement may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (alkali) chemical burns.

Some individuals may exhibit an allergic response upon exposure to portland cement, possibly due to trace elements of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with portland cement products.

Effects Resulting from Inhalation:

Portland cement may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease.

Exposure to portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects Resulting from Ingestion:

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten.

Carcinogenic potential:

Portland cement is **not** listed as a carcinogen by NTP, OSHA, or IARC. It may however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a potential trace level contaminant in Portland cement, is now classified by IARC as known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

Medical conditions which may be aggravated by, inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.
Unusual (hyper) sensitivity to hexavalent chromium (chromium⁺⁶) salts.

Section 4 - FIRST AID

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

Skin

Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside.

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Section 5 - FIRE AND EXPLOSION DATA

Flash point	None	Lower Explosive Limit.....	None
Upper Explosive Limit.....	None	Auto ignition temperature.....	Not Combustible
Extinguishing media.....	Not Combustible	Special fire fighting Procedures.....	None
Hazardous combustion products.....	None	Unusual fire and explosion hazards....	None

Section 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash portland cement down drains.

Dispose of waste material according to local, state and federal regulations.

Section 7 - HANDLING AND STORAGE

Keep portland cement dry until used. Normal temperatures and pressures do not affect the material.

Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin Protection

Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened portland cement. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Wear sturdy boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams: barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry portland cement or by wet cement or concrete fluids with a pH neutral soap. Wash again at the end of work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

Respiratory Protection

Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be certified under 42 CFR 84.)

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye Protection

Where potentially subject to splashes or puffs of cement, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with portland cement or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL, PROPERTIES

Appearance.....Gray Powder	Odor.....No distinct odor
Physical state.....Solid (powder)	pH (in water).....12 to 13
Solubility in water...Slightly soluble (0.1 to 1.0%)	Vapor pressure.....Not applicable
Vapor density.....Not applicable	Boiling point.....Not applicable (i.e., > 1000 C)
Melting point.....Not applicable	Specific gravity (H2O = 1.0).....3.15
Evaporation rate.....Not applicable	

Section 10 - STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

Unintentional contact with water.

Incompatibility

Wet Portland cement is alkaline. As such it is incompatible with acids, ammonium salts and phosphorous.

Hazardous decomposition

Will not spontaneously occur. Adding water produces (caustic) calcium hydroxide

Hazardous Polymerization

Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

For a description of available, more detailed toxicological information contact the supplier or manufacturer.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

No recognized unusual toxicity to plants or animals

Relevant physical and chemical properties

(See Sections 9 and 10.)

Section 13 - DISPOSAL

Dispose of waste material according to local, state and federal regulations. (Since portland cement is stable, uncontaminated material may be saved for future use.

Dispose of bags in an approved landfill or incinerator.

Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name

Portland is cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class

Not applicable

Identification number

Not applicable.

Required label text

Not applicable.

Hazardous substances/reportable quantities (RQ)

Not applicable.

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200

Portland cement is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/SUPERFUND 40 CFR 117 and 302

Not listed.

Hazard Category under SARA(Title III), Sections 311 and 312

Portland cement qualifies as a "hazardous substance" with delayed health effects.

Status under SARA (Title III), Section 313

Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997)

Some substances in portland cement are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act

Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under California Proposition 65

This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

Section 16 - OTHER INFORMATION

Prepared by

Kevin Keegan
Director - Health and Safety
CEMEX, Inc.
Houston, Texas

Approval date or Revision date

Approved: August, 1997
Revised: March, 2001

Other important information

Portland cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that portland cement chemically reacts with water, and that some of the intermediate products of this reaction (that is those present while a portland cement product is "setting") pose a more severe hazard than does dry portland cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide the all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CEMEX, Inc. except that the product shall conform to contracted specifications. The information provided herein was believed by CEMEX, Inc. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

SAMPLE TREATED GRAIN (1.00%)
MATERIAL SAFETY DATA SHEET

Product Name: SAMPLE TREATED GRAIN (1.00%)

SECTION I

Registrant:
California Dept. of Food & Agriculture
1220 N Street,
Sacramento, CA 94271-0001
EPA SLN NO. CA 890026

Manufacturer Name:
.Company X
110 Any Street
Your Town, CA 95959
EPA EST. NO. 11211-WI-1

Emergency Phone Numbers: 916-555-5555 California Department of Food and
Agriculture - Integrated Pest Control
999-999-9999 Company X. (Madison, WI office)
777-777-7777 CHEMTREC

Date Prepared: 12/06/91
Date Amended: 07/26/93

SECTION II - Hazardous Ingredients/Identity Information

Specific Chemical Identity	OSHA PEL	ACGIH TLV	Other Limits Recommended	%Ingr.
Zinc Phosphide (Phosphine) (CAS No. 1314-84-7)	N/A	TWA=0.4 mg/M ³	STEL=1 mg/M ³ 1.0	
Inert ingredients: (non-hazardous) Grain, Sticker, Lampblack	N/A	N/A	N/A	99.0

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCE WHICH IS REGULATED UNDER SARA, TITLE III, SECT. 313: Zinc Phosphide (CAS NO. 1314-84-7) 1.0 %

SECTION III - Physical/Chemical Characteristics

Boiling Point:	N/A
Specific Gravity (water = 1)	Bulk Density = 31-34 lbs/cu.ft.
Vapor Pressure (mm Hg)	N/A
Vapor Density (air = 1)	Phosphine = 1.17
Melting Point:	N/A
Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in water:	Negligible (product), slowly decomposes in water (active ingredient).
Appearance and Odor:	Dark gray-black. Garlic odor, pungent.

SECTION IV - Fire and Explosion Hazard Data

Flash Point: N/A

Flammability Limits: UEL: N/A LEL: N/A

Extinguishing Media: Use dry chemical or carbon dioxide. Avoid water and foam as they may form phosphide gas.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fight fire from

Unusual Fire and Explosive Hazards: Toxic fumes. Also see reactivity section.

N/A = Not Available

SAMPLE TREATED GRAIN (1.00%)**SECTION V - Reactivity Data**

Stability: Stable under normal conditions.
Conditions to avoid: Avoid heat, incompatible materials.

Incompatibility (Materials to Avoid): Acids, including dilute. Water.
May react with oxidizers.

Hazardous Decomposition Products: May react with acids or water to release toxic and spontaneously flammable phosphine gas. Oxides of phosphorus and zinc.

Hazardous Polymerization: Will not occur.
Conditions to avoid: None.

SECTION VI - Health Hazard Data

Routes of Entry:	Inhalation?	Yes
	Skin?	Yes
	Ingestion?	Yes

Health Hazards (Acute and Chronic): Acute Oral LD₅₀ of a 2% meal bait is 595 mg/kg (rats). Acute Dermal LD₅₀

Carcinogenicity:	NTP?	Not Listed.
	IARC Monographs?	Not Listed.
	OSHA Regulated?	Not Listed.

Signs and Symptoms of Exposure: Local irritation, nausea, garlic breath odor, restlessness, diarrhea, low blood pressure, fever, shock, tremors, fatigue, excessive perspiration, abdominal cramps, breathing difficulty, change in skin color.

Medical Conditions Generally Aggravated by Exposure: Not known.

STATEMENT OF PRACTICAL TREATMENT

Any persons applying zinc phosphide products and experiencing signs and symptoms such as nausea, abdominal pain, tightness in the chest, or weakness, should be seen by a physician immediately.

IF SWALLOWED: Immediately call a Poison Control Center or physician, or transport the patient to the nearest hospital. Do not drink water. Do not administer anything by mouth or make the patient vomit unless advised to do so by a physician.

IF IN EYES: Flush with plenty of water. Get medical attention if irritation persists.

IF ON SKIN: Remove contaminated clothing and wash affected areas with soap and water.

SECTION VII - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Avoid bodily contact. Wear protective equipment. Keep water and ignition sources away. Carefully shovel/sweep up and package material in clean, dry labeled containers. Move containers away and flush surfaces with plenty of water. Regard washings as waste. Keep out of bodies of water and sewer.

Waste Disposal Method: Pesticide waste are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide Agency.

Precautions to be Taken in Handling and Storing: Harmful if swallowed. Do not breathe dust or fumes. Avoid contact with skin and eyes. Wash thoroughly after handling and before eating or smoking. Do not contaminate water, food or feed by storage or disposal. Keep out of reach of children and domestic animals.

SAMPLE TREATED GRAIN (1.00%)

Other Precautions: Store in a cool, dry, well-ventilated area. Clean up spilled bait promptly. For Use Only in California. This is a Restricted Use Pesticide.

SECTION VIII - Control Measures

Respiratory Protection (specify type): Cartridge or canister type respirator for toxic dusts if industrial hygiene evaluation indicates need. Use clean, well-maintained MSHA/NIOSH approved equipment fitted to user.

Ventilation: Local Exhaust? Yes, in manufacturing plant.
Mechanical (general)? Yes, needed for storage and use areas.
Special? None.
Other? None.

Protective Gloves: Cotton gloves changed and washed or discarded regularly.

Eye Protection: Goggles or shielded safety glasses for use of product. Maintain eyewash facility.

Other Protective Clothing or Equipment: Long sleeved shirt and trousers changed or washed regularly.

Work/Hygienic Practices: Wash thoroughly after handling product.

SECTION IX - California Addendum (Proposition 65) Safe Drinking Water and Toxic Enforcement Act of 1986

The following specific warnings are hereby given relative to substances that the State of California has identified as carcinogens and/or reproductive hazards under Proposition 65:

- WARNING: This product contains a chemical known to the State of California to cause
- WARNING: This product contains a chemical known to the State of California to cause

SECTION X - SARA III HAZARD CATEGORY: For Reporting Under Sections 311 & 312

Immediate Yes Delayed No Fire No
Reactive Yes Sudden Release of Pressure No
(Zinc Phosphide is the Immediate and Reactive Hazard)

SECTION XI - Shipping Information

D.O.T. Hazard Classification: Not D.O.T. Regulated.
Bill of Lading Description: Vermin Exterminators, NOI

All information contained in this Material Safety Data Sheet is furnished free of charge and is intended for your evaluation. In our opinion the information is, as of the date of this Material Safety Data Sheet, reliable, however, it is your responsibility to determine the suitability of the information for your use. You are advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional or variable conditions or circumstances exist or because of applicable laws or governmental regulations. Therefore, you should use this information only as a supplement to other information gathered by you and you must make independent determinations of the suitability and completeness of the information from all sources to assure both proper use of the material described herein and the safety and health of employees. Accordingly, no guarantee expressed or implied is made by Registrant or Manufacturer as to the results to be obtained based upon your use of the information nor does Registrant or Manufacturer assume any liability arising out of your use of the information.

SODA ASH (Sodium Carbonate)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name : SODA ASH (Sodium Carbonate)
 Product grade(s) : Dense Soda Ash
 Chemical Name : Sodium carbonate
 Synonyms : soda salt, disodium carbonate
 Molecular formula : Na₂CO₃
 Molecular weight : 106 g/mol

1.2. Use of the Substance/Mixture

Recommended use : - Glass industry
 - Metallurgy
 - Detergent
 - Chemical industry
 - Pulp and paper
 - Ion exchange resins regenerating agent
 - Purifying flue gas

1.3. Company/Undertaking Identification

Address : SOLVAY CHEMICALS, INC.
 3333 RICHMOND AVENUE
 HOUSTON TX 77098-3099
 USA

1.4. Emergency and contact telephone numbers

Emergency telephone number : 1 (800) 424-9300 CHEMTREC® (USA & Canada)
 01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number (product information): US: +1-800-765-8292 (Product information)
 US: +1-713-525-6500 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 2 F= 0 I= 0 S= None
 HMIS : H= 2 F= 0 R= 0 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : granules, powder
 Colour : white

Odour : odourless

2.2. Potential Health Effects:

Inhalation

- May cause nose, throat, and lung irritation.
- Repeated or prolonged exposure: Risk of sore throat, nose bleeds.
- (in case of higher concentration): Cough.

Eye contact

- Severe eye irritation
- Symptoms: Redness, Lachrymation, Swelling of tissue.

Skin contact

- Prolonged skin contact may cause skin irritation.

Ingestion

- Severe irritation
- Symptoms: Nausea, Abdominal pain, Vomiting, Diarrhoea.

Other toxicity effects

- See section 11: Toxicological Information

2.3. Environmental Effects:

- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Sodium carbonate
 CAS-No. : 497-19-8
 Concentration : >= 99,8 %

4. FIRST AID MEASURES

4.1. Inhalation

- Move to fresh air.
- If symptoms persist, call a physician.

4.2. Eye contact

- In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If eye irritation persists, consult a specialist.

4.3. Skin contact

- Wash off with soap and water.
- If symptoms persist, call a physician.

4.4. Ingestion

- Rinse mouth with water.
- Do NOT induce vomiting.
- If symptoms persist, call a physician or Poison Control Centre immediately.

4.5. Notes to physician**Exposure to decomposition products :**

- Immediate medical attention is required.
- If accidentally swallowed obtain immediate medical attention.
- Oxygen or artificial respiration if needed.

5. FIREFIGHTING MEASURES**5.1. Suitable extinguishing media**

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- Not combustible.

5.4. Hazardous decomposition products

- none

5.5. Special protective equipment for firefighters

- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES**6.1. Personal precautions, protective equipment and emergency procedures****6.1.1. Advice for non-emergency personnel**

- Evacuate personnel to safe areas.
- Avoid dust formation.

6.1.2. Advice for emergency responders

- Use personal protective equipment.
- Sweep up to prevent slipping hazard.
- Prevent further leakage or spillage.

6.2. Environmental precautions

- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.
- Prevent any mixture with an acid into the sewer/drain (gas formations).
- Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

- Sweep up and shovel into suitable containers for disposal.

6.4. Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE**7.1. Handling**

- Ensure adequate ventilation.
- Minimize dust generation and accumulation.
- Avoid contact with skin and eyes.
- Keep away from Incompatible products.

7.2. Storage

- Store in original container.
- Keep in a dry place.
- Keep in properly labelled containers.
- Keep container closed.
- Keep away from Incompatible products.

7.3. Packaging material

- Polyethylene
- Woven plastic material + PE.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1. Exposure Limit Values****Sodium carbonate**

- SAEL (Solvay Acceptable Exposure Limit) 2007
TWA = 10 mg/m³

Particles not otherwise specified (PNOS)

- Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) 07 2006
time weighted average = 10 mg/m³
Remarks: Total dust
- Canada, British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) 07 2006
time weighted average = 3 mg/m³
Remarks: respirable dust fraction
- Canada, Ontario OELs. (Control of Exposure to Biological or Chemical Agents) 03 2006
time weighted average = 3 mg/m³
Remarks: Respirable particles.
- Canada, Ontario OELs. (Control of Exposure to Biological or Chemical Agents) 11 2010
time weighted average = 10 mg/m³
- US, ACGIH Threshold Limit Values 2007
time weighted average = 3 mg/m³
Remarks: as respirable particles
- US, ACGIH Threshold Limit Values 2010
time weighted average = 10 mg/m³
Remarks: Inhalable fraction

- Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) 12 2008
time weighted average = 10 mg/m³
Remarks: Total dust
- Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) 07 2009
time weighted average = 3 mg/m³
Remarks: Respirable particles.
- Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) 07 2009
time weighted average = 10 mg/m³
Remarks: Total particulate.
- Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) 05 2009
8 hour average contamination limit: = 10 mg/m³
Remarks: Alveolar dust fraction
- Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) 05 2009
8 hour average contamination limit: = 3 mg/m³
Remarks: respirable dust fraction
- Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) 05 2009
15 minute average contamination limit: = 20 mg/m³
Remarks: Alveolar dust fraction
- Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) 05 2009
15 minute average contamination limit: = 6 mg/m³
Remarks: respirable dust fraction
- Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) 03 2011
time weighted average = 10 mg/m³
- Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) 03 2011
time weighted average = 3 mg/m³

8.2. Engineering controls

- Provide appropriate exhaust ventilation at places where dust is formed.
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

8.3. Personal protective equipment**8.3.1. Respiratory protection**

- Effective dust mask.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

8.3.2. Hand protection

- Wear suitable gloves.
- Suitable material: Neoprene, Natural Rubber

8.3.3. Eye protection

- Goggles

8.3.4. Skin and body protection

- Dust impervious protective suit
- Rubber or plastic boots
- Rubber or plastic apron

8.3.5. Hygiene measures

- When using, do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES**9.1. General Information**

Appearance	: granules, powder
Colour	: white
Odour	: odourless

9.2. Important health safety and environmental information

pH	: 11,16 <i>Concentration: 4 g/l</i> <i>Temperature: 25 °C (77 °F)</i>
	: 11,3 <i>Concentration: 10 g/l</i> <i>Temperature: 25 °C (77 °F)</i>
pKa	: pKa1= 6,35; pKa2 = 10,33
Boiling point/boiling range	: <i>Remarks: not applicable</i>
Flash point	: <i>Remarks: not applicable</i>
Flammability	: <i>Remarks: not applicable</i>
Explosive properties	: <i>Explosion danger:</i> <i>Remarks: not applicable</i>
Oxidizing properties	: <i>Remarks: Non oxidizer</i>
Vapour pressure	: <i>Remarks: negligible</i>
Relative density / Density	: 2,53 <i>Temperature: 20 °C (68 °F)</i>
Bulk density	: from 56 lb/ft ³ : to 66 lb/ft ³ : from 0,9 kg/dm ³ : to 1,06 kg/dm ³

SODA ASH (Sodium Carbonate)

Revision Date: 13.06.2014

Solubility(ies)	: = 71 g/l <i>Remarks: Water</i> <i>Temperature: 0 °C (32 °F)</i>
	: = 215 g/l <i>Remarks: Water</i> <i>Temperature: 20 °C (68 °F)</i>
Partition coefficient: n-octanol/water	: <i>Remarks: not applicable</i>
Viscosity	: <i>Remarks: not applicable</i>
Vapour density	: <i>Remarks: not applicable</i>
Evaporation rate	: <i>Remarks: not applicable</i>

9.3. Other data

Melting point/range	: 851 °C (1.564 °F)
Auto-flammability	: <i>Remarks: not applicable</i>
Granulometry	: 80 - 100 % < 160 µm
Decomposition temperature	: > 400 °C (752 °F)

10. STABILITY AND REACTIVITY

10.1. Stability

- Stable under recommended storage conditions.

10.2. Conditions to avoid

- Exposure to moisture.

10.3. Materials to avoid

- Finely divided aluminium

10.4. Hazardous decomposition products

- none

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity

- LD50, rat, 2.800 mg/kg

Acute inhalation toxicity

- LC50, 2 h, guinea pig, 0,8 mg/l
- LC50, 2 h, mouse, 1,2 mg/l

SODA ASH (Sodium Carbonate)

Revision Date: 13.06.2014

- LC50, 2 h, rat, 2,3 mg/l
- Acute dermal irritation/corrosion**
- LD50, rabbit, > 2.000 mg/kg
- Skin irritation**
- rabbit, No skin irritation
 - Human experience, No skin irritation
- Eye irritation**
- rabbit, irritant effects
- Carcinogenicity**
- Remarks: No data available
- Genetic toxicity in vitro**
- In vitro tests did not show mutagenic effects
- Reproductive toxicity**
- Oral route (gavage), 10 days, Various species, 179 mg/kg, Did not show teratogenic effects in animal experiments.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Fishes, *Lepomis macrochirus*, LC50, 96 h, 300 mg/l
- Crustaceans, *Ceriodaphnia dubia*, EC50, 48 h, 200 - 227 mg/l

12.2. Mobility

- Air
Remarks: not applicable
- Water
Remarks: Solubility(ies)
- Water
Remarks: Mobility
- Soil/sediments
Remarks: not significant

12.3. Persistence and degradability

Abiotic degradation

- Water, hydrolyses
Result: acid/base equilibrium as a function of pH
Degradation products: carbonic acid/bicarbonate/carbonate

Biodegradation

- Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

12.4. Bioaccumulative potential

- Result: Does not bioaccumulate.

12.5. Other adverse effects

SODA ASH (Sodium Carbonate)

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12.6. Remarks

- No data available

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- Contact waste disposal services.
- If recycling is not practicable, dispose of in compliance with local regulations.
- Dilute with plenty of water.
- Neutralise with acid.
- In accordance with local and national regulations.

13.2. Packaging treatment

- Where possible recycling is preferred to disposal or incineration.
- Clean container with water.
- Dispose of rinse water in accordance with local and national regulations.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - No

14. TRANSPORT INFORMATION

- Sea (IMO/IMDG)
- not regulated
- Air (ICAO/IATA)
- not regulated
- U.S. Dept of Transportation
- not regulated
- It is recommended that ERG Guide number 111 be used for all non-regulated material.
- Canadian Transportation of Dangerous Goods
- not regulated

15. REGULATORY INFORMATION

15.1. Inventory Information

Australia. Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.
Canada. Domestic Substances List (DSL)	: -	In compliance with inventory.
Korean Existing Chemicals List (ECL)	: -	In compliance with inventory.
EU list of existing chemical	: -	In compliance with inventory.

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substances (EINECS)		
Korea. Existing Chemicals Inventory (KECI (KR))	: -	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	: -	In compliance with inventory.
Philippine. Inventory of Chemicals and Chemical Substances (PICCS)	: -	In compliance with inventory.
USA. Toxic Substances Control Act (TSCA)	: -	In compliance with inventory.
New Zealand. Inventory of Chemicals (NZIOC)	: -	In compliance with inventory.

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- no.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

- not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- not regulated.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- not regulated.

15.3. Classification and labelling

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

- D2B - Toxic Material Causing Other Toxic Effects

Remarks: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

EC Label - According to Regulation (EC) 1272/2008, as amended

Name(s) on label

Hazardous components : Sodium carbonate

Signal word

Warning

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Hazard pictogramsHazard statements

H319 - Causes serious eye irritation.

Precautionary statements

Prevention	P264 P280	- Wash hands thoroughly after handling. - Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	P305 + P351 + P338 P337 + P313	- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - If eye irritation persists: Get medical advice/ attention.

16. OTHER INFORMATION**Ratings :****NFPA (National Fire Protection Association)**

Health = 2 Flammability = 0 Instability = 0 Special =None

HMIS (Hazardous Material Information System)

Health = 2 Fire = 0 Reactivity = 0 PPE : Supplied by User; dependent on local conditions

Further information

- Update
This data sheet contains changes from the previous version in section(s): 15.2
- Distribute new edition to clients

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all

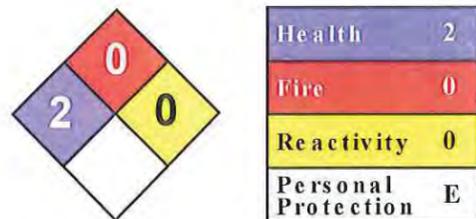
legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

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Material Safety Data Sheet

Sodium sulfate anhydrous MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium sulfate anhydrous	Contact Information:
Catalog Codes: SLS3685, SLS1465, SLS2089, SLS3511, SLS1294	Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396
CAS#: 7757-82-6	US Sales: 1-800-901-7247
RTECS: WE1650000	International Sales: 1-281-441-4400
TSCA: TSCA 8(b) inventory: Sodium sulfate anhydrous	Order Online: ScienceLab.com
Cl#: Not available.	CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
Synonym:	International CHEMTREC, call: 1-703-527-3887
Chemical Name: Sodium Sulfate Anhydrous	For non-emergency assistance, call: 1-281-441-4400
Chemical Formula: Na ₂ SO ₄	

Section 2: Composition and Information on Ingredients

Composition:		
Name	CAS #	% by Weight
Sodium sulfate anhydrous	7757-82-6	100

Toxicological Data on Ingredients: Sodium sulfate anhydrous: ORAL (LD50): Acute: 5989 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:

Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: At a temperature of 800 C, sodium sulfate and aluminum will explode.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:

Do not ingest. Do not breathe dust. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance:

Solid. (Crystals solid. Crystalline powder. Granular solid. Powdered solid.)

Odor: Odorless.

Taste: Bitter. Saline.

Molecular Weight: 142.06 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 1100°C (2012°F)

Melting Point: 888°C (1630.4°F)

Critical Temperature: Not available.

Specific Gravity: 2.671 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Soluble in cold water, hydrogen iodide, and glycerol.. Insoluble in alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess dust generation, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Hygroscopic. Sodium sulfate reacts violently with magnesium. Also incompatible with aluminum, potassium, mercury, lead, calcium, silver, barium, ammonium ions, and strontium. Sulfates give precipitates with salts of lead, barium, strontium, and calcium. Silver and mercury form slightly soluble salts. Alcohol precipitates most sulfates out of solution.

Special Remarks on Corrosivity:

The rates of corrosion of iron and steel in water are a function of the specific mineral quality as well as the alkalinity and pH values. Sodium sulfate ... is a strong contributor to the rate of corrosion. For example, in water with 400 mg/l of alkalinity (as CaCO₃) at pH 7, the corrosion rate will be zero at 200 mg/l of Na₂SO₄, but when the concentration of sodium sulfate is 400 mg/l, the corrosion rate will be about 100 mg per square cm per day.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD₅₀): 5989 mg/kg [Mouse].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fetotoxicity) based on animal studies. Human human data found May cause cancer (tumorigenic) based on animal studies. No human data found. Placental absorption of sulfate ion has been characterized. Sulfate ion levels at term are somewhat higher in fetal than in maternal blood.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May cause irritation, although it is not known to be an irritant. Eyes: May cause eye irritation. Ingestion: Saline cathartics (laxatives) are poorly absorbed from the gastrointestinal tract; hence, systemic toxicity is unlikely unless massive amounts have been ingested. Ingestion of large amounts may cause gastrointestinal (digestive) tract irritation with abdominal pain, nausea, vomiting, diarrhea. Low hazard for usual industrial handling. Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD₅ and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: Sodium sulfate anhydrous Massachusetts RTK: Sodium sulfate anhydrous TSCA 8(b) inventory: Sodium sulfate anhydrous

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

R36- Irritating to eyes. S36- Wear suitable protective clothing. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:28 PM

Last Updated: 05/21/2013 12:00 PM

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**MATERIAL SAFETY DATA SHEET
FOR
THORN SMITH LABORATORIES
ANALYZED QUANTITATIVE UNKNOWN**

Zinc Ore for Zn
Catalog Number 80-1715

Manufacturer: Auric Enterprises, Inc.
d/b/a Thorn Smith Laboratories
Address: 7755 Narrow Gauge Road
Beulah, MI 49617
Phone Number: 231-882-4672
MSDS Number: TSL-030
Date Prepared: March 7, 1980
Date Updated: December 22, 2011

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS - Chemical Name & Common Names
(Hazardous Components 1% or greater; Carcinogens 0.1% or greater)

Zinc Metal Powder

Formula: Zn
CAS No.: 7440-66-6
Common Synonyms: Powdered zinc; blue powder
Molecular Weight: 65.37
OSHA PEL: 5 mg/m³ TWA, 10 mg/m³ STEL for zinc fume oxide fume
ACGIH TLV: N/E
OTHER LIMITS: N/A

Limestone Standard

Formula: Primarily carbonates of calcium, magnesium. Non-hazardous.
CAS No.: N/A
OSHA PEL: TWA 10 mg/m³
ACGIH TLV: N/E
OTHER LIMITS: N/A

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 907° C (1665° F) (Zn); N/A Limestone
Specific Gravity (H₂O=1): 7.14 (Zn); N/A Limestone
Vapor Pressure (mm Hg and Temperature): 1 @ 487° C (909° F) (Zn)
Melting Point: 419° C (787° F) (Zn)
Vapor Density (Air=1): N/A

Evaporation Rate (-1): N/A
Solubility in Water: N/A
Water Reactive: N/A
Appearance and Odor: Gray or bluish-gray powder. Odorless.

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Fire: Zinc powder is not pyrophoric but will burn in air at elevated temperatures. Autoignition temperatures are approximately 680° C (dust cloud) or 460° C (layer). Bulk dust in damp state may heat spontaneously and ignite on exposure to air. Releases flammable hydrogen gas upon contact with acids or alkali hydroxides.
Explosion: Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Extinguisher Media: Smother with a suitable dry powder (sodium chloride, magnesium oxide (Zinc)).
Special Fire Fighting Procedures: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.
Unusual Fire and Explosion Hazards: Releases flammable hydrogen gas upon contact with acids or alkali hydroxides.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: Stable Unstable
Conditions to Avoid: No information found.
Incompatibility (Materials to Avoid): Zinc powder can react violently with sulfur and halogens. Dangerous or potentially dangerous with strong oxidizing agents, lower molecular weight chlorinated hydrocarbons, strong acids or alkalies.
Hazardous Decomposition Products: Hydrogen in moist air, zinc oxide with oxygen at high temperature. Zinc metal, when melted, produces zinc vapor which oxidizes and condenses in air to form zinc fume.
HAZARDOUS POLYMERIZATION: May Occur Will Not Occur

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY:
 Inhalation Ingestion Skin Contact Eye Contact Not Hazardous
CARCINOGEN LISTED IN:
 NTP OSHA IARC Monograph Not Listed

TOXICITY: No information found relating to normal routes of occupational exposure.

HEALTH HAZARDS - Acute:

Skin Contact: May cause irritation.
Eye Contact: May cause irritation.
Inhalation: No adverse effects expected by dust may cause irritation. The effects may be expected to resemble those of inhaling an inert dust; possible difficulty breathing, sneezing, coughing. When heated, the fumes are highly toxic and may cause fume fever.
Ingestion: Extremely large oral doses may produce gastrointestinal disturbances, due both to mech-

anical effects and the possibility of reaction with gastric juice to produce zinc chloride. Pain, stomach cramps and nausea could occur in aggravated cases.

HEALTH HAZARDS - Chronic: No information found.

Signs and Symptoms of Exposure: No information found.

Medical Conditions Generally Aggravated by Exposure: Persons with pre-existing skin disorders or impaired respiratory function may be more susceptible to the effects of the substance.

EMERGENCY FIRST AID PROCEDURES - Seek medical assistance for further treatment, observation, and support if necessary.

Eye Contact: Immediately flush with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally.

Ingestion: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person.

Inhalation: If a person breathes in large amounts, move exposed person to fresh air. Get medical attention for any breathing difficulty.

Skin Contact: Remove any contaminated clothing. Wipe off excess from skin. Immediately wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

Acute: Yes Chronic: No Flammability: Yes Pressure: No Reactivity: Yes

Extremely Hazardous Substance: No

CERCLA Hazardous Substance: 1000 lbs.

SARA 313 Toxic Chemicals: Yes

TSCA Inventory: No

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type): For conditions where exposure to the dust is apparent, a dust/mist respirator may be worn.. (NIOSH approved)

Protective Gloves: Wear rubber gloves.

Eye Protection: Wear chemical safety goggles. Contact lenses should not be worn while working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

VENTILATION TO BE USED: A local exhaust system, which captures the contaminant at its source, is recommended to prevent dispersion of the contaminant into the workroom air.
____ Other(Specify)

Other Protective Clothing and Equipment: Wear clean body-covering clothing.

Hygienic Work Practices: Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilites.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & LEAK/USE PROCEDURES

Steps to be taken if material is spilled or released: Remove all sources of ignition and provide mild ventilation in area of spill. Substance may be pyrophoric and self-ignite. Clean-up personnel require protective clothing, goggles and dust/mist respirators. Sweep or vacuum up the spill in a manner that does not disperse zinc powder in the air and place the zinc in a closed container for recovery or disposal. Dispose in a RCRA approved facility.

Precautions to be taken in handling and storage: Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Store in accordance with all applicable local, state, and federal environmental regulations.

Other precautions and/or special hazards: No information available.

NFPA Rating: Health: **1** Flammability: **1** Reactivity: **0** Other: **Water Reactive**.

HMIS Rating: No information available.

SECTION 8 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

Domestic (D.O.T.)

Proper Shipping Name: Chemical, n.o.s. (Non-regulated)

International (T.M.O.)

Proper Shipping Name: Chemical, n.o.s. (Non-regulated)

AIR (I.C.A.O.)

Proper Shipping Name: Chemical, n.o.s. (Non-regulated)

NOTE:

Per section 172.101 of 49CFR Chapter 1, this material is a mixture of a hazardous material and (Zinc Metal Powder) and a non-hazardous material (Limestone); and can be shipped as N.O.S. (non-regulated). Actual mixture quantities are identified on the analysis sheet which accompanies every order.

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and assume no liability resulting from its use. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

Material Safety Data Sheet

Material Name: Aluminum Scrap

ID: NFE-0103

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Mixture

Product Use: Scrap metal usage.

Manufacturer Information

The David J. Joseph Company
300 Pike Street
Cincinnati, OH 45202

Contact: Dept. of Safety & Environmental Services
Phone: (513) 621-8770
Emergency # (800) 424-9300 - ChemTrec

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
7429-90-5	Aluminum	>70
7440-21-3	Silicon	<23
7440-31-5	Tin	<20
7440-50-8	Copper	<11
7439-95-4	Magnesium	<11
7440-66-6	Zinc	<9
7439-92-1	Lead	<9
7439-93-2	Lithium	<4
7440-02-0	Nickel	<3
7440-48-4	Cobalt	<3
7440-43-9	Cadmium	<3
7439-96-5	Manganese	<2
7439-89-6	Iron	<2
7440-62-2	Vanadium	<1
7440-22-4	Silver	<1
7440-47-3	Chromium	<1
7440-41-7	Beryllium	<1
7440-36-0	Antimony	<1

Component Information/Information on Non-Hazardous Components

This data sheet is prepared as a guideline for typical uses of scrap materials. The user should be aware that the composition of the scrap can vary based upon the raw materials, processes used, and protective coatings that may have been applied to the original materials. The list of ingredients below are typical ingredients thought to be present in the scrap material. This list includes contaminants that may or may not be present. The percentages given vary from shipment to shipment and may not be entirely accurate for a given shipment and may not be entirely accurate for a given shipment.

Protective coatings, including paints, lubricants, corrosion inhibitors, etc., may have been applied to the material before it came under the control of the recycler. These coatings may contain hazardous materials. Typical hazardous materials contained in these coatings include: lead, zinc, chromium, and cadmium. Some organic materials may also be present. The supplier (recycler) may have no specific knowledge of the particular contaminant. However, it is anticipated that the hazardous materials present in the coatings would generally represent less than 0.1% of the total material present. The health hazards presented by these contaminants would produce their greatest potential for exposure during processes such as melting, cutting, welding. These processes could generate metal fumes that might produce the health hazards identified in section III of this MSDS.

It is suggested that the user protect employees by utilizing engineering controls that reduce exposures to acceptable concentrations. Where engineering controls are not feasible, appropriate personal protective equipment should be utilized.

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*** Section 3 - Hazards Identification ***

Emergency Overview

Product is supplied as scrap metal consisting of aluminum alloy. This is a non-combustible, non-reactive solid material. Processing of the product for some final uses can include formation of dusts, particulates or fumes which may present certain health hazards. Generation of large quantities of airborne dusts and particulates may produce a fire hazard. Molten metal may react violently with water. Exposure to powder or dusts may be irritating to eyes, nose and throat. Product may cause mechanical abrasions and irritation to the eyes and skin.

Hazard Statements

CAUTION Dusts, particulates or fumes generated from this product may be irritating to the eyes, skin and respiratory system and may cause fever, chills and muscular aches. May contain beryllium, nickel, copper, cobalt, chromium, antimony and lithium which may cause allergic skin and/or respiratory sensitization reactions. May contain cadmium, cobalt, beryllium, lead and nickel which may cause cancer. Chronic overexposure to dusts, particulates and fumes may result in gastrointestinal damage, lung, liver and kidney damage, anemia, cardiac abnormalities, neurological damage and may pose a reproductive hazard.

Potential Health Effects: Eyes

Dust or powder may cause irritation and/or inflammation to the eye tissue. Rubbing may cause abrasion of cornea.

Potential Health Effects: Skin

Prolonged contact with this product may cause allergic skin sensitization reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely; however if ingested may cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: gastric ulcers, shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma.

Potential Health Effects: Inhalation

Product contains components that may cause allergic respiratory sensitization and cancer. Dusts, vapors, and fumes generated during processing may irritate the respiratory system. Overexposure to processing fumes may cause metal fume fever which is an influenza like illness. Symptoms include headache, metallic taste in the mouth, cough, thirst, throat irritation, shortness of breath, fever, sweating and pain in the limbs. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

HMIS Ratings: Health: 1* Fire: 0 Reactivity: 0 Pers. Prot.: safety glasses with side shields, gloves

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In cases of contact, flush eyes immediately with large amounts of water. If irritation persists get medical attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

First Aid: Skin

For skin contact, wash immediately with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

First Aid: Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

First Aid: Inhalation

If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. Seek medical attention immediately.

First Aid: Notes to Physician

No additional information available.

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*** Section 5 - Fire Fighting Measures ***

Flash Point: Not applicable

Method Used: Not applicable

Upper Flammable Limit (UFL): Not available

Lower Flammable Limit (LFL): Not available

Auto Ignition: Not applicable

Flammability Classification: Non-flammable

Rate of Burning: Not applicable

General Fire Hazards

Dust accumulation from this product may present an explosion hazard in the presence of an ignition source. Coatings and oils applied to the product may enhance flammability.

Hazardous Combustion Products

This product may release metal oxide fumes by thermal decomposition.

Extinguishing Media

Dry chemical, soda ash, sand.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition.

Clean-Up Procedures

Small pieces of this product may be collected with a broom and shovel. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Put material in suitable, covered, labeled containers.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

None necessary.

*** Section 7 - Handling and Storage ***

Handling Procedures

Do not inhale dusts or vapors produced during thermal processing. Avoid eye and excessive skin contact. Use only with adequate ventilation. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Special care must be taken to avoid buildup of dusts.

Storage Procedures

Keep this material in a cool, well-ventilated place.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Follow all applicable exposure limits. Keep formation of dusts, particulates and fumes to a minimum.

B: Component Exposure Limits

Aluminum (7429-90-5)

ACGIH: metal dust, as Al: 10 mg/m3 TWA

OSHA: total dust, as Al: 15 mg/m3 TWA; respirable fraction, as Al: 5 mg/m3 TWA

NIOSH: total: 10 mg/m3 TWA; respirable dust: 5 mg/m3 TWA; pyro powders and welding fumes: 5 mg/m3 TWA; soluble salts and alkyls: 2 mg/m3 TWA

Silicon (7440-21-3)

ACGIH: 10 mg/m3 TWA (The value is for total dust containing no asbestos and <1% crystalline silica)

OSHA: total dust: 10 mg/m3 TWA; respirable fraction: 5 mg/m3 TWA

NIOSH: total: 10 mg/m3 TWA; respirable dust: 5 mg/m3 TWA

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Tin (7440-31-5)

ACGIH: metal: 2 mg/m3 TWA
0.2 mg/m3 STEL

skin - potential for cutaneous absorption

OSHA: inorganic compounds (except oxides), as Sn: 2 mg/m3 TWA; organic compounds, as Sn: 0.1 mg/m3 TWA

organic compounds: Prevent or reduce skin absorption

NIOSH: as Sn: 2 mg/m3 TWA

Copper (7440-50-8)

ACGIH: fume: (0.2) mg/m3 TWA; dusts and mists, as Cu: (1) mg/m3 TWA

OSHA: fume, as Cu: 0.1 mg/m3 TWA

NIOSH: as Cu: 1 mg/m3 TWA (dusts and mists); 0.1 mg/m3 TWA (fume)

Lead (7439-92-1)

ACGIH: 0.05 mg/m3 TWA

OSHA: as Pb: 50 ug/m3 TWA PEL; 30 ug/m3 action level; Poison (see 29 CFR 1910.1025)

NIOSH: as Pb: 0.100 mg/m3 TWA; see Appendix C for supplementary exposure limits

Cobalt (7440-48-4)

ACGIH: elemental, as Co: 0.02 mg/m3 TWA

OSHA: as Co: 0.05 mg/m3 TWA

NIOSH: as Co: 0.05 mg/m3 TWA

Nickel (7440-02-0)

ACGIH: metal: (1) mg/m3 TWA

OSHA: 1 mg/m3 TWA

NIOSH: as Ni: 0.015 mg/m3 TWA; NIOSH Potential Occupational Carcinogen - see Appendix A

Cadmium (7440-43-9)

ACGIH: elemental, total dust, as Cd: 0.01 mg/m3 TWA; respirable fraction: 0.002 mg/m3 TWA

OSHA: 2.5 ug/m3 TWA action level; 5 ug/m3 TWA; do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas; carcinogen; dust can cause lung and kidney disease (see 29 CFR 1910.1027)

NIOSH: NIOSH Potential Occupational Carcinogen - see Appendix A

Manganese (7439-96-5)

ACGIH: as Mn, 0.2 mg/m3 TWA

OSHA: fume, as Mn: 1 mg/m3 TWA
compounds, as Mn: C 5 mg/m3

NIOSH: as Mn: 1 mg/m3 TWA
3 mg/m3 STEL

Chromium (7440-47-3)

ACGIH: 0.5 mg/m3 TWA

OSHA: (as Cr): 1 mg/m3 TWA

NIOSH: as Cr: 0.5 mg/m3 TWA; see Appendix C for supplementary exposure limits

Antimony (7440-36-0)

ACGIH: as Sb: 0.5 mg/m3 TWA

OSHA: as Sb: 0.5 mg/m3 TWA

NIOSH: 0.5 mg/m3 TWA

Beryllium (7440-41-7)

ACGIH: 0.002 mg/m3 TWA

0.01 mg/m3 STEL

OSHA: as Be: 2 ug/m3 TWA
25 ug/m3 STEL (30 min)
C 5 ug/m3

NIOSH: as Be: Not to exceed 0.0005 mg/m3; NIOSH Potential Occupational Carcinogen - see Appendix A

Silver (7440-22-4)

ACGIH: metal: 0.1 mg/m3 TWA

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OSHA: as Ag: 0.01 mg/m³ TWA
NIOSH: as Ag: 0.01 mg/m³ TWA

Engineering Controls

Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH/MSHA approved respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Depends upon scrap composition, most often appears as a silver-white metal.	Odor: Not available
Physical State: Solid	pH: Not applicable
Vapor Pressure: Not applicable	Vapor Density: Not applicable
Boiling Point: 4450 deg F (2450 deg C)	Melting Point: 1220 deg F (660 deg C)
Solubility (H₂O): Insoluble	Specific Gravity: 3

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under normal conditions.

Chemical Stability: Conditions to Avoid

Avoid dispersion of dust in air. Molten metal may react violently with water. Fine particles, dust or fumes may be flammable or explosive. Avoid strong oxidizing agents.

Incompatibility

Aluminum may react with halocarbons, mercury, chlorine, chlorates, bromates, iodates, peroxides, perchlorates, nitrates, nitrites, oxides, performates, persulfates, halogens, oxides of nitrogen, melted sulfates, sulfur dioxide, propylene dichloride, sodium carbide, sodium carbonate and sodium hydroxide.

Hazardous Decomposition

Decomposition of this product may yield metallic oxides.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

No information available for the product. Operations which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Exposure to dusts or fumes from some metals including iron, zinc, manganese, chromium, cobalt and copper can produce a condition known as metal fume fever, a flu-like illness generally lasting 24 hours or less including symptoms of nausea, vomiting, chest tightness, muscle aches and weakness. Aluminum soluble compounds, when ingested or inhaled, may have neurotoxic effects evidently due to the metal binding to nervous tissue. Chronic overexposure to aluminum can result in lung damage and has been associated with asthma-like syndrome. Accumulation of aluminum in the body may result in neurological

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damage, anemia and bone softening. Repeated overexposure to high levels of aluminum oxide may lead to pulmonary fibrosis, a progressive lung disorder. Early signs of manganese poisoning are sluggishness, loss of appetite, sleepiness, weakness in the legs, uncontrollable laughter, hallucinations, delusions, spastic or slow gait, speech impairment, aggressiveness, tremor, mask-like faces, and clumsy movements. Overexposure to manganese may result in CNS effects, anemia and lung damage. Chronic exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis. Other possible effects of copper overexposure include discoloration of skin or hair, and liver and kidney damage. Overexposure to beryllium may cause headaches, fatigue, nausea, metallic taste, conjunctivitis, and allergic skin sensitization, while chronic overexposure may cause pulmonary edema, congestive heart failure, abnormal liver functions, and CNS effects. Iron dust can irritate the eyes and respiratory tract by mechanical action. Acute iron poisoning may involve hemorrhagic vomiting and diarrhea, abdominal pain, acidosis, coagulaopathy, shock, coma and convulsions followed by hepatic and renal failure and perhaps cardiovascular collapse. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment. Systemic effects from ingestion of nickel include capillary damage, kidney damage, myocardial weakness and central nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Contact with nickel compounds may also result in allergic lung sensitization reactions. Exposure to antimony has been known to cause allergic skin sensitization reactions resulting in "antimony spots" on the surface of the skin. Chronic overexposure to antimony may cause gastrointestinal damage, cardiac damage, pneumoconiosis, and obstructive lung disease. Lead has been found to have toxic effects on both the central and peripheral nervous systems. Acute exposure to lead may cause acute encephalopathy which is accompanied by the symptoms of ataxia, coma, and convulsions. As toxicity progresses, symptoms of periperal neuropathy can develop, as well as some cases of irreversible kidney damage. Zinc poisoning can cause anemia, lethargy and dizziness. Effects of overexposure to cobalt include lung effects (irritation, fibrosis, asthma, pneumoconiosis), goiter and cardiovascular effects (cardiomyopathy), and allergic skin and lung sensitization reactions. Lithium metal is extremely reactive and can cause burns because of the formation of lithium hydroxide ion on exposure to moisture. Chronic exposure to lithium carbonate can cause kidney damage and other systemic effects. Inhalation of cadmium may be harmful with symptoms including tracheobronchitis, pneumonitis, pulmonary edema and death. Overexposure to cadmium may cause liver damage, anemia and irreversible kidney damage. Silver can be harmful if inhaled, absorbed through the skin, or ingested. Symptoms may include gastrointestinal distress, pulmonary edema, convulsions and shock. Chronic overexposure to silver may cause argyria, a gray-blue pigmentation of the skin or organs, loss of strength, convulsive seizures, mild bronchitis, and renal and liver toxicities.

Dusts and fumes from this product may cause cancer, reproductive and/or birth defects.

B: Component Analysis - LD50/LC50

Silicon (7440-21-3)

Oral LD50 Rat: 3160 mg/kg

Cobalt (7440-48-4)

Oral LD50 Rat: 6171 mg/kg

Cadmium (7440-43-9)

Oral LD50 Mouse: 890 mg/kg

Inhalation LC50 Rat: 25 mg/m³/30M

Oral LD50 Rat: 2330 mg/kg

Manganese (7439-96-5)

Oral LD50 Rat: 9 gm/kg

Iron (7439-89-6)

Oral LD50 Rat: 30 gm/kg

Antimony (7440-36-0)

Oral LD50 Rat: 7 gm/kg

Carcinogenicity

A: General Product Information

No information available for the product. There is sufficient evidence to associate beryllium with an increase of lung cancer in exposed workers. Cadmium exposure has been linked with increased incidence of lung, prostate and kidney cancer.

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Although some lead salts have produced tumors in animals, the evidence is insufficient to determine the carcinogenicity of lead in humans. A significant excess of lung cancer mortality was seen in a study of hard metal workers with at least one year of cobalt exposure. The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers. There is a possible link between occupational exposure to antimony and lung cancer.

B: Component Carcinogenicity

Lead (7439-92-1)

ACGIH: elemental, as Pb; A3 - animal carcinogen
OSHA: as Pb: 50 ug/m3 TWA PEL; 30 ug/m3 action level; Poison (see 29 CFR 1910.1025)
IARC: Monograph 23, Supplement 7; 1987 (and lead compounds; evaluated as a group) (Group 2B (sufficient animal data))

Cobalt (7440-48-4)

ACGIH: elemental, as Co; A3-animal carcinogen
IARC: Monograph 52; 1991 (and cobalt compounds; evaluated as a group) (Group 2B (sufficient animal data))

Nickel (7440-02-0)

NIOSH: occupational carcinogen
NTP: suspect carcinogen (Listed under 'Nickel and certain nickel compounds') (Possible Select Carcinogen)
IARC: Monograph 49; 1990 (and alloys) (Group 2B (sufficient animal data))

Cadmium (7440-43-9)

ACGIH: elemental, as Cd; A2-suspected human carcinogen
OSHA: 2.5 ug/m3 TWA action level; 5 ug/m3 TWA; do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas; carcinogen; dust can cause lung and kidney disease (see 29 CFR 1910.1027)

NIOSH: occupational carcinogen
NTP: suspect carcinogen (Listed under 'Cadmium and certain cadmium compounds') (Possible Select Carcinogen)
IARC: Monograph 58; 1993 (and Cadmium compounds; evaluated as a group) (Group 1 (carcinogenic to humans))

Chromium (7440-47-3)

ACGIH: A4-not classifiable as a human carcinogen
IARC: Monograph 49; 1990 (Group 3 (not classifiable))

Beryllium (7440-41-7)

ACGIH: as Be; A1-confirmed human carcinogen
NIOSH: occupational carcinogen
NTP: suspect carcinogen (Listed under 'Beryllium and certain beryllium compounds') (Possible Select Carcinogen)
IARC: Monograph 58; 1993 (and beryllium compounds; evaluated as a group) (Group 1 (carcinogenic to humans))

Epidemiology

No information available for the product.

Neurotoxicity

No information available for the product. Inhalation of fine aluminum particles has produced progressive encephalopathy, followed by dementia and convulsions. Symptoms of lead toxicity include behavioral disturbances including irritability, restlessness, insomnia, and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. In acute lead encephalopathy, neurological damage can be permanent. Chronic overexposure to manganese can cause "manganism". Manganism is characterized by fatigue, irritability, headaches and asthenia. Symptoms are reversible when exposure stops.

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Mutagenicity

No information available for the product. The binding of DNA to aluminum may alter, expose, or hide different critical regions in genes for expression or regulation in vivo. Nickel inhibited DNA repair and induced transformation in experimental assays. Increases in sister chromatid exchanges were seen in lymphocytes of workers exposed to chromium, cobalt and nickel dusts. Manganese and cobalt have caused sister chromatid exchanges in human and hamster cells. Exposure to lead has been reported to cause chromosome aberrations in humans. Elevated frequencies of chromosome aberrations have been shown in workers exposed to cadmium.

Teratogenicity

No information available for the product. Aluminum has been shown to have teratogenic effects. Copper and nickel have been reported to have adverse reproductive effects in experimental animals and shown to be fetotoxic in experimental animals. Beryllium has been shown to cross the placental barrier and beryllium salts have been shown to increase the incidence of embryonic deaths and fetal edema in experimental animals. Lead has a wide variety of reproductive effects in humans. It can affect both the male and female reproductive organs as well as egg and sperm production and development. Lead can also cause neurodevelopmental debilitations in children from both prenatal and postnatal exposures. There is some evidence that cadmium might induce testicular damage in men and may affect male fertility. Excessive zinc levels have been reported to be associated with increased risk for neural tube defects. Lithium is a suspect human reproductive hazard based on reports of an increased risk of birth defects and altered sperm in people ingesting lithium salts. Women working in antimony processing had increased miscarriages, premature births, gynecological disease and developmental delay in their children.

Other Toxicological Information

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Aluminum (7429-90-5)

EC50 (48 hr) water flea: 1.4 mg/L.

Zinc (7440-66-6)

LC50 (96 hr) rainbow trout: 0.24-0.76. Cond: 20-46 mg/L CaCO₃; LC50 (96 hr) fathead minnow: 0.78-0.96 mg/L. Cond: 20 mg/L CaCO₃; LC50 (96 hr) fathead minnow: 4.7-6.1 mg/L. Cond: pH 8.0, 50 mg/L CaCO₃; LC50 (96 hr) bluegill: 5.4-10.6. Cond: 20-46 mg/L CaCO₃; LC50 (96 hr) bluegill: 40.9 mg/L. Cond: 360 mg/L CaCO₃; EC50 (48 hr) water flea: 0.04 mg/L.

Environmental Fate

No information available for the product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

This product contains a component or components identified as hazardous under 40 CFR 261.24.

B: Component Waste Numbers

Lead (7439-92-1)

RCRA: waste number D008; regulatory level = 5.0 mg/L

Cadmium (7440-43-9)

RCRA: waste number D006; regulatory level = 1.0 mg/L

Chromium (7440-47-3)

RCRA: waste number D007; regulatory level = 5.0 mg/L

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Beryllium (7440-41-7)

RCRA: waste number P015

Silver (7440-22-4)

RCRA: waste number D011; regulatory level = 5.0 mg/L

Disposal Instructions

Byproducts and residues from this product may be reprocessed or recycled. Upon disposal, collected dusts and other similar wastes could contain a constituent identified as a hazardous waste. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Certain forms of this material (i.e. powders, borings, shavings, turnings, cuttings, dross, etc.) may be subject to U.S. DOT hazardous material shipping requirements. If products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements as DOT hazardous materials.

Hazard Class: Not available.

UN/NA #: Not available.

Packing Group: Not available.

Required Label(s): Not available.

Additional Info.: Not available.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). The following component analysis applies only to those facilities that are required to report under applicable regulations.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)

SARA 313: form R reporting required for 1.0% de minimus concentration (fume or dust only)

Copper (7440-50-8)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Lead (7439-92-1)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 10 pounds (4.54 kg)

Zinc (7440-66-6)

SARA 313: form R reporting required for 1.0% de minimus concentration (only fume or dust)

CERCLA: final RQ = 1000 pounds (454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)

Cobalt (7440-48-4)

SARA 313: form R reporting required for 0.1% de minimus concentration

Nickel (7440-02-0)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 100 pounds (45.4 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

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Cadmium (7440-43-9)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 10 pounds (4.54 kg) (No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Manganese (7439-96-5)

SARA 313: form R reporting required for 1.0% de minimus concentration

Chromium (7440-47-3)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous material is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Antimony (7440-36-0)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of solid metal released is equal to or exceeds 0.004 inches)

Beryllium (7440-41-7)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 10 pounds (4.54 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Vanadium (7440-62-2)

SARA 313: form R reporting required for 1.0% de minimus concentration (only fume or dust)

Silver (7440-22-4)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 1000 pounds (454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)

C: Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	(as Copper metal powder); DOT regulated severe marine pollutant

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	Yes	Yes
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	Yes	Yes	No	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes	Yes	Yes	Yes
Zinc	7440-66-6	Yes	Yes	Yes	No	Yes	Yes
Lithium	7439-93-2	No	Yes	Yes	No	Yes	Yes
Cobalt	7440-48-4	Yes	Yes	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Cadmium	7440-43-9	Yes	Yes	Yes	Yes	Yes	Yes

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Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No	No
Chromium	7440-47-3	Yes	Yes	Yes	Yes	Yes	Yes
Antimony	7440-36-0	Yes	Yes	Yes	Yes	Yes	Yes
Beryllium	7440-41-7	Yes	Yes	Yes	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	No	Yes	No	Yes	Yes
Silver	7440-22-4	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
 WARNING! This product contains a chemical known to the state of California to cause cancer.
 WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Other Regulations

A: General Product Information

No information available for the product.

B: Component Analysis - Inventory

	CAS #	TSCA	DSL	EINECS
Aluminum	7429-90-5	Yes	Yes	Yes
Silicon	7440-21-3	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes
Magnesium	7439-95-4	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes
Zinc	7440-66-6	Yes	Yes	Yes
Lithium	7439-93-2	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes
Cadmium	7440-43-9	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes
Iron	7439-89-6	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes
Antimony	7440-36-0	Yes	Yes	Yes
Beryllium	7440-41-7	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	Yes	Yes
Silver	7440-22-4	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum	7429-90-5	1% item 47 (197)
Tin	7440-31-5	1% item 1571 (804)
Copper	7440-50-8	1% item 433 (578)
Lead	7439-92-1	0.1% item 937 (1435)
Cobalt	7440-48-4	0.1% item 417 (566)

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Nickel	7440-02-0	0.1% item 1126 (1193)
Cadmium	7440-43-9	0.1% item 287 (378)
Manganese	7439-96-5	1% item 974 (1077)
Chromium	7440-47-3	0.1% item 399 (561)
Beryllium	7440-41-7	0.1% item 182 (295)

***** Section 16 - Other Information *****

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NFPA = National Fire Protection Association; HMIS = High Efficiency Particulate Air; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act.

This is the end of MSDS # NFE-0103