



**Molten Sulfur**  
**Revision: 3**  
**Revised Date:**  
 July 29, 2010  
**Replaces MSDS dated:**  
 August. 6, 2008

**FOR CHEMICAL EMERGENCY**  
**24 Hours**

**IN CANADA Call CANUTEC (613) 996-6666**  
**IN the USA Call CHEMTREC (800) 424-9300**  
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**SECTION 01 – CHEMICAL PRODUCT & COMPANY IDENTIFICATION**

**COMPANY INFORMATION:**

<p><b>Corporate Office</b>          CHEMTRADE LOGISTICS          155 Gordon Baker Road          Suite 300          Toronto, Ontario M2H 3N5  <b>Prepared by:</b> Chemtrade Logistics Inc.  <b>Date Prepared:</b> July 29, 2010  <b>For MSDS Info:</b> (416) 496-5856  <a href="http://www.chemtradelogistics.com">www.chemtradelogistics.com</a></p>	<p><b>Sales/ Customer Service</b>          CHEMTRADE LOGISTICS          7905 boul. Louis-H Lafontaine          Suite 200          Anjou QC H1K 4E4  <b>Main Office:</b> (514) 640-2002</p>
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**HAZARD RATINGS:**

WHMIS:	CONTROLLED	NFPA	RATING	HMIS	RATING
<b>CLASS</b>	B4 – Flammable Solid	<b>HEALTH</b>	2	<b>HEALTH</b>	2
	D-2B – Material causing other toxic effects (TOXIC)	<b>FLAMMABILITY</b>	1	<b>FLAMMABILITY</b>	1
		<b>REACTIVITY</b>	0	<b>REACTIVITY</b>	0
		<b>SPECIFIC HAZARD</b>	NONE	<b>PERSONAL PROTECTION</b>	G

**PRODUCT INFORMATION:**

**PRODUCT NAME:** Molten Sulfur  
**CAS NUMBER:** 7704-34-9 (Sulfur)  
**FORMULA:** S (Elemental Sulfur)  
**PRIMARY PRODUCT USE:** Manufacture of Sulfuric Acid & Sulfur Dioxide; Vulcanizing rubber; Synthesis of dyes; Bleaching Wood Pulp  
**SYNONYMS:** Sulfur; Sulphur; Brimstone  
**CHEMICAL FAMILY:** Non-Metallic Element  
**TRADE NAMES:** None

**SECTION 02 – COMPOSITION/INFORMATION ON INGREDIENTS**

No.	COMPONENT	CAS NO.	WT. %	EXPOSURE LIMITS
1.	Sulfur	7704-34-9	99 - 100	15 mg/m <sup>3</sup> TWA OSHA (as total dust) 5 mg/m <sup>3</sup> TWA OSHA (as respirable dust) 10 mg/m <sup>3</sup> TWA ACGIH (as inhalable dust) 3 mg/m <sup>3</sup> TWA ACGIH (as respirable dust)
♦ 2.	Hydrogen Sulfide*	7783-06-4	0 – 0.5	10 ppm TWA OSHA (vacated) 1 ppm ACGIH 15 ppm STEL OSHA (vacated) 5 ppm ACGIH 100 ppm IDLH

\* NOTE - OSHA Exposure limits for Hydrogen sulfide reflect the revised OSHA PELs vacated in 1992 that have been adopted by some states. Federal OSHA standards are 20 ppm ceiling and 50 ppm 10-minute peak concentration.

## SECTION 03 - HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:**

**WARNING! FLAMMABLE SOLID! HOT MOLTEN SULFUR WILL CAUSE SEVERE BURNS ON CONTACT. SULFUR BURNS WITH PALE BLUE FLAME THAT MAY BE DIFFICULT TO SEE IN DAYLIGHT AND PRODUCES TOXIC SULFUR DIOXIDE GAS. VAPOR SPACE IN CONTAINERS MAY CONTAIN TOXIC CONCENTRATIONS OF HYDROGEN SULFIDE, WHICH MAY BE FATAL IF INHALED OR ABSORBED THROUGH THE SKIN. HYDROGEN SULFIDE IS VERY FLAMMABLE AND EVEN EXPLOSIVE UNDER CERTAIN CONDITIONS.**

**HYDROGEN SULFIDE MAY CAUSE IRRITATION, BREATHING FAILURE, COMA AND DEATH. USE EXTREME CAUTION WHEN OPENING CLOSED CONTAINERS OR SPACES WHERE HYDROGEN SULFIDE GAS CAN BUILD-UP TO HIGH CONCENTRATIONS.**

(REFER TO SECTION 11 FOR ADDITIONAL INFORMATION)

EXPECTED ROUTE OF ENTRY	
SKIN CONTACT:	X
SKIN ABSORPTION:	
EYE CONTACT:	X
INHALATION:	X
INGESTION:	X

**EFFECTS OF EXPOSURE:****SKIN CONTACT:**

Molten Sulfur will cause severe thermal burns on contact. Inflammation, redness and blistering may occur.

Prolonged and repeated contact with cooled material may cause moderate to severe skin irritation and possible sensitization in sensitive individuals.

**EYE CONTACT:**

Contact with Molten Sulfur will cause immediate pain, severe thermal burns, and permanent corneal damage. Damage may result in blindness.

Mists and dusts of sulfur may cause moderate to severe eye irritation, conjunctivitis, and possible corneal damage.

Vapors may irritate the eyes.

**INHALATION:**

Inhalation of dusts and vapors may cause irritation of the respiratory system (nose, mouth, throat and lungs).

Chronic long term exposure to sulfur dust may cause bronchitis.

Hydrogen Sulfide vapors can be FATAL at concentrations above 200 ppm. At concentrations above 150 ppm, characteristic rotten egg odor may not be sensed due to olfactory fatigue.

**INGESTION:**

Molten Sulfur will cause severe thermal burns to mouth, esophagus, and stomach.

Ingestion of sulfur dust in large amounts may cause upset stomach, abdominal pains, nausea, vomiting, and diarrhea.

**CHRONIC**

Ingestion or direct contact with large amounts of sulfur may lead to Hydrogen Sulfide poisoning due to bacterial conversion of sulfur in the colon.

**KNOWN EFFECTS ON OTHER ILLNESSES:**

Breathing of dusts, vapors or mists may aggravate persons with acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis. Sensitive individuals can experience an allergic type response.

**LISTED CARCINOGEN:**

Components are **NOT** classified as Carcinogens by the National Toxicology Program (NTP).

The Occupational Safety and Health Administration (OSHA) does **NOT** regulate these compounds as Carcinogens.

Components have **NOT** been evaluated by the International Agency for Research on Cancer (IARC) and American Conference of Governmental Industrial Hygienists (ACGIH)

NONE:	<b>X</b>
OSHA:	
NTP:	
IARC:	
OTHER:	

**SECTION 04 - FIRST AID MEASURES****FIRST AID FOR EYES:**

Flush **IMMEDIATELY** under running water for minimum of 20 minutes. Hold eyelids open during flushing. If redness or irritation persists, repeat flushing. Seek **IMMEDIATE** medical attention.

**FIRST AID FOR SKIN:**

Flush **IMMEDIATELY** under running water for minimum of 20 minutes. Remove contaminated clothing. If redness or irritation persists, repeat flushing. If skin irritation persists or blistering occurs, seek **IMMEDIATE** medical attention. Removal of solidified Molten Sulfur from skin requires medical assistance.

**FIRST AID FOR INHALATION:**

Remove subject to fresh air. Seek medical aid if lung irritation persists or if breathing becomes difficult. If breathing stops, begin artificial respiration (rescue breathing). If no pulse, begin Cardiopulmonary Resuscitation (CPR). Seek **IMMEDIATE** medical attention.

**FIRST AID FOR INGESTION:**

**DO NOT INDUCE VOMITING.** Contact Local Poison Control Center. If victim is alert and not convulsing, rinse mouth with water. If vomiting occurs, have victim lean forward with head down. If ingested, **IMMEDIATELY** seek medical attention and bring copy of the MSDS.

**NOTE TO PHYSICIAN:**

Treat in accordance with nature of observed signs and symptoms of the patient consistent with Emergency and First-Aid procedures. Treat Molten Sulfur burns with petroleum jelly or mineral oil.

## SECTION 05 - FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:**

WATER:	<b>X</b>
ALCOHOL FOAM:	
CARBON DIOXIDE (CO <sub>2</sub> ):	<b>X</b>
DRY CHEMICAL:	<b>X</b>
WATER/FOG SPRAY:	<b>X</b>
NO EXTINGUISHING MEDIA:	

**FLASH POINT (°F):** 404.6 (207°C)

**FLAMMABLE LIMITS:** (as dust in air)

Lower Explosive Limit (LEL): 35 g/m<sup>3</sup>

Upper Explosive Limit (UEL): 1400 g/m<sup>3</sup>

**AUTOIGNITION TEMPERATURE (°F):** 449.6 (232°C)

**EVACUATION:**

If tank, rail car, or truck is involved in a fire, **ISOLATE** for 800 meters (1/2/ mile) in **ALL** directions. Consider initial evacuation for 800 meters (1/2/ mile) in **ALL** directions.

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition products include sulfur dioxide and sulfur trioxide.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Use NIOSH approved positive pressure self-contained breathing apparatus and full protective clothing.

Exercise **CAUTION** when fighting any chemical fire.

Keep containers cool by spraying with flooding amounts of water. Avoid open flame and sparks. Prohibit smoking.

Use water in flooding quantities as fog. Apply water from as far a distance as possible. If water is used, contain runoff. Small fires can be extinguished with sand.

Avoid straight streams of water, which can scatter Molten Sulfur and dust. Sulfur dust is combustible and can form explosive mixtures in air.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Easily ignitable, combustible solid. Finely dispersed suspension sulfur dust may form explosives mixtures in air.

Prevent deposition of dust. Use dust explosion proof equipment and lighting. Prevent build-up of electrostatic charges by grounding equipment.

Sulfur burns with pale blue flame that may be difficult to see in daylight.

Hydrogen Sulfide is flammable and is heavier than air. Hydrogen Sulfide vapors may travel a considerable distance to source of ignition and flashback. Hydrogen Sulfide has LEL of 4.3% and UEL OF 45% by volume.

**SECTION 06 - ACCIDENTAL RELEASE MEASURES****STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:**

If safe to do so, stop discharge and contain spill by forming barriers to minimize contaminated area. Allow molten material to solidify. Prevent material from entering water sources and sewers.

Consider initial evacuation for at least 100 meters (330 feet). Eliminate ALL ignition sources in immediate area.

Wear proper personal protective equipment. Avoid inhalation of dust and vapors. Do not touch or walk through spilled material.

If appropriate, lightly moisten material to prevent creation of dust. Clean up spilled material with spark proof scoops or shovels and place in suitable clean, dry containers. Cover loosely. Remove containers from spill area.

Decontaminate tools and equipment by scrubbing with soap and water. Remove any cleaning wastes and contaminated soil with the recovered material.

Cleaned up material not anticipated to be a RCRA Hazardous Waste; however, generator is responsible for proper characterization of waste material. Dispose waste material at approved waste treatment/disposal facility in accordance with applicable State, Local, Provincial and Federal regulations. Do **NOT** dispose with normal garbage or to sewer systems.

**SECTION 07 - HANDLING AND STORAGE****HANDLING PROCEDURES:**

Avoid generation of dust. Wear appropriate personal protective equipment to avoid contact with eyes and skin. Avoid inhalation of dust and vapors.

Molten Sulfur should not be placed in any tank, railcar, or truck containing trace quantities of hydrocarbons or more than a trace of moisture.

When unloading railcars, tank trucks or other Molten Sulfur containers, workers should wear suitable protective equipment including respiratory protection and stand to one side, upwind of the path of the escaping gas. Dome bolts and covers should be loosened slowly to vent the gas pressure.

Employ proper grounding, venting and explosion relief provisions. Electrical installations and equipment should be installed in accordance with the National Electrical Code (NEC). Reference National Fire Protection Association (NFPA) Standard 655 – Standard for Prevention of Sulfur Fires and Explosions.

Tanks should be filled from the bottom to prevent build-up of static electricity.

Head space of tanks and other containers should be periodically monitored for explosive levels of Hydrogen Sulfide. Care should be taken against dangerous concentrations in Hydrogen Sulfide in the vicinity of the Molten Sulfur containers during steaming and during ventilation after loading.

**STORAGE INFORMATION:**

Molten Sulfur should be maintained at temperatures between 260<sup>0</sup> F and 300<sup>0</sup> F (127<sup>0</sup> C and 149<sup>0</sup> C)

Molten Sulfur is stored in insulated storage tanks or pits heated with steam coils. Piping should be provided to permit steam to be used to smother tank or pit fires.

Store in cool, well ventilated areas. Molten Sulfur storage areas should be ventilated to prevent accumulation of toxic and explosive concentrations of Hydrogen Sulfide.

Storage areas should be separated from chlorates, nitrates, oxidizers and other incompatible materials.

Prohibit smoking within 25 feet of Molten Sulfur storage areas.

## **SECTION 08 - EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **PERSONAL PROTECTIVE EQUIPMENT:**

Heat resistant, insulated gloves and body protection recommended when handling Molten Sulfur. Gloves should be long enough to overlap shirt cuffs.

A hard hat, high top steel-toed safety shoes and face shield worn with safety glasses with side shields should also be worn. Wear loose fitting long sleeve shirts and full length pants covering shoe tops.

### **RESPIRATORY PROTECTION:**

For dust exposures, use NIOSH approved respirators with at least N95 dust filters.

NIOSH approved supplied air respirators recommended for Hydrogen Sulfide concentrations up to 100 ppm.

Respirators equipped with acid gas cartridges may be used for escape purposes only.

For high concentrations, as well as Fire-fighting and other emergencies, use NIOSH approved positive pressure, self-contained breathing apparatus.

### **SKIN PROTECTION:**

#### **PROTECTIVE GLOVES:**

Use insulated/heat resistant impervious gloves.

#### **EYE PROTECTION:**

Face shield worn with safety glasses with side shields.

### **OTHER PROTECTIVE EQUIPMENT:**

Have eyewash and safety shower available in the work area.

### **ENGINEERING CONTROLS:**

Use enclosed process and local exhaust ventilation to keep airborne contaminants below recommended exposure limits.

### **EXPOSURE LIMITS:**

Refer to **SECTION 2** for Recommended Exposure Limits.

### **IDLH (IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONCENTRATION):**

100 ppm for Hydrogen Sulfide.

## SECTION 09 – PHYSICAL AND CHEMICAL PROPERTIES

<b>CHEMICAL FORMULA:</b>	S or S <sub>8</sub> (for sulfur)
<b>MOLECULAR WEIGHT:</b>	32.06 or 256.5 (for sulfur)
<b>PHYSICAL STATE:</b>	Solid (Molten)
<b>APPEARANCE AND ODOR:</b>	Yellow to reddish brown flowing material with pungent rotten egg odor
<b>ODOR THRESHOLD:</b>	Pure Sulfur is odorless 0.0005 to 0.0094 ppm ( for hydrogen sulfide)
<b>pH:</b>	Not applicable
<b>SOLUBILITY IN WATER (% IN WATER):</b>	Practically Insoluble
<b>SPECIFIC GRAVITY:</b>	1.8 @ 248°F (120°C)
<b>VAPOR DENSITY (AIR=1):</b>	3.64
<b>BOILING POINT (°F):</b>	831 - 837 (444 - 447 °C)
<b>MELTING POINT (°F):</b>	235 to 246 (113 to 119 °C)
<b>VAPOR PRESSURE (MM HG):</b>	0.11 @ 284°F (140°C)
<b>EVAPORATION RATE:</b>	Not Applicable

## SECTION 10 - STABILITY AND REACTIVITY

<b>STABILITY:</b>	STABLE (under normal conditions) FLAMMABLE (under fire conditions)
<b>CONDITIONS TO AVOID:</b>	Creation of excessive amounts of sulfur dust.  Excessive heat, sources of ignition and open flames.  Closed spaces may allow accumulation of lethal concentrations of Hydrogen Sulfide gas, use in well ventilated areas.
<b>HAZARDOUS POLYMERIZATION:</b>	Will not occur
<b>INCOMPATIBILITY:</b>	Sulfur is incompatible with a number of chemical materials. This incompatibility may produce excessive heat; uncontrolled reactions; released of toxic products; and/or result in fire or explosion.  Strong oxidizers such as Nitrates, Chlorates and Peroxides.  Heavy metals, Ammonia, Carbides, Halogens, Phosphorous, Ammonium Nitrate, Charcoal, and a number of other compounds.

## SECTION 11 - TOXICOLOGICAL INFORMATION

Slight acute toxicity

This product is **NOT** known or reported to be Carcinogenic by any reference source including IARC, NTP, OSHA or EPA.

This product is **NOT** known or reported to have any reproductive, mutagenic, or teratogenic effects

**REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) NUMBER:**

WS4250000 (for sulfur)

MX1225000 (for hydrogen sulfide)

**TOXICITY**

TOXICITY (Sulfur)	DESCRIPTION	RESULTS	TESTED ON
<b>ACUTE ORAL</b>			
<b>LD<sub>50</sub> (ORAL):</b>	LETHAL DOSE (50%)	> 3000 mg/kg of body weight	Rat
<b>LD<sub>100</sub> (ORAL):</b>	LETHAL DOSE (100%)	750 – 1100 mg/kg of body weight	Rat
<b>LD<sub>50</sub> (ORAL):</b>	LETHAL DOSE (50%)	2500 mg/kg of body weight	Rabbit
<b>LD<sub>100</sub> (ORAL):</b>	LETHAL DOSE (100%)	> 500 mg/kg of body weight	Rabbit
<b>ACUTE INHALATION</b>			
<b>LC<sub>50</sub> (INHALATION):</b>	LETHAL CONCENTRATION (50%)	> 0.047mg/L (4 hours)	Rodent
<b>ACUTE DERMAL</b>			
<b>LD<sub>50</sub> (DERMAL):</b>	LETHAL DOSE (50%)	> 2000 mg/kg of body weight	Rabbit
<b>SKIN EFFECTS:</b>	SKIN IRRITATION	NOT IRRITATING	Rabbit
<b>EYE EFFECTS:</b>	EYE IRRITATION	NOT IRRITATING	Rabbit

Elemental sulfur formulations are widely used as Fungicides and Insecticides. As such, U.S. EPA has prepared a standard for sulfur which includes summary of human experience in applying sulfur based products. Main incidents were related to skin and eye irritation with occasional systemic effects.

**SECTION 12 - ECOLOGICAL INFORMATION**

**ENVIRONMENTAL TOXICITY:**

SPECIES	TEST TYPE	ENDPOINT	DURATION (hours)	DESCRIPTION	RESULT (mg/l)
<b>ACUTE TOXICITY</b>					
<i>BRACHYDANIO RERIO</i> (fresh water fish)	Static	Lethal Concentration (0%)	96	LC <sub>0</sub>	750
		Lethal Concentration (50%)		LC <sub>50</sub>	866
		Lethal Concentration (100%)		LC <sub>100</sub>	1000
<i>DAPHNIA MAGNA</i> (crustacea)	Not specified	Effective Concentration (0% - no effect)	24	EC <sub>0</sub>	> 10000
ACTIVATED SLUDGE	Aquatic	Effective Concentration (50%)	3	EC <sub>50</sub>	1900
<b>CHRONIC TOXICITY</b>					
<i>COLINNUS VIRGINIANUS</i> (avian)	Oral	Mortality	8 days	LC <sub>50</sub>	> 5620

Elemental sulfur is converted to sulfate ion in soil by autotrophic bacteria. The bisulfite ion is natural constituent in soil and has been shown to leach through soil at a slow rate.

Sulfur is insoluble in water at 68°F (20°C). Over long term exposure, sulfur can oxidize under certain conditions to yield acidic runoff that may be harmful to aquatic life at high concentrations.

**BIOLOGICAL ELIMINATION:** Not Determined

**BIOACCUMULATION POTENTIAL:** Negative

### SECTION 13 - DISPOSAL CONSIDERATIONS

#### WASTE DISPOSAL INFORMATION:

If this product becomes a waste, it is not anticipated to become a Hazardous Waste. However, the generator of the waste material is responsible for the proper characterization of the material

Consider collection of residual material into suitable containers for reclamation of disposal.

Owner of the waste is responsible for the proper disposal of the material. Dispose of material in accordance with ALL applicable State, Local, Provincial, and Federal regulations at approved waste management site.

### SECTION 14 - TRANSPORT INFORMATION

<b>U.S. DOT REGULATED:</b>	REGULATED
<b>SHIPPING NAME:</b>	SULFUR, MOLTEN
<b>UN/NA NUMBER:</b>	2448
<b>HAZARD CLASS:</b>	9 (4.1- International)
<b>PACKAGING GROUP:</b>	III
<b>SPECIAL PROVISIONS:</b>	30, IB3, T1, & TP3 (refer to 49 CFR 172.102)
<b>NON-BULK:</b>	49 CFR 173.213
<b>BULK:</b>	49 CFR 173.247
<b>PASSENGER/CARGO AIRCRAFT:</b>	FORBIDDEN (in molten form)
<b>VESSEL STOWAGE:</b>	ON DECK ONLY AWAY FROM CORROSIVES AND OXIDIZERS.
<b>ER GUIDE:</b>	133

<b>CANADIAN TRANSPORT REGULATION:</b>	REGULATED
<b>SHIPPING NAME:</b>	SULFUR, MOLTEN or SULPHUR, MOLTEN
<b>UN/NA NUMBER:</b>	2448
<b>HAZARD CLASS:</b>	4.1
<b>PACKAGING GROUP:</b>	III
<b>SPECIAL PROVISIONS:</b>	SCHEDULE 2 - #32
<b>PASSENGER CARRYING ROAD/RAIL INDEX</b>	FORBIDDEN

### SECTION 15 - REGULATORY INFORMATION

#### OSHA:

Meets criteria for hazardous material as defined by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1910.1200.

**TSCA:**

We certify that all components of this product are registered under the regulations of the Toxic Substances Control Act (TSCA).

**SARA (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): Sulfur**

SARA (SECTION 311/312):		SARA (SECTION 302):		RQ
REACTIVE HAZARD:	N	EXTREMELY HAZARDOUS SUBSTANCE:	N	
PRESSURE HAZARD:	N	CERCLA HAZARDOUS SUBSTANCE:	N	
FIRE HAZARD:	Y			
IMMEDIATE/ACUTE:	Y	SARA (SECTION 304):		
DELAYED/CHRONIC:	Y	RELEASE NOTIFICATION	N	

**SARA (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): Hydrogen Sulfide**

SARA (SECTION 311/312):		SARA (SECTION 302):		RQ
REACTIVE HAZARD:	N	EXTREMELY HAZARDOUS SUBSTANCE:	Y	500 lbs.
PRESSURE HAZARD:	N	CERCLA HAZARDOUS SUBSTANCE:	Y	100 lbs.
FIRE HAZARD:	Y			
IMMEDIATE/ACUTE:	Y	SARA (SECTION 304):		
DELAYED/CHRONIC:	Y	RELEASE NOTIFICATION	Y	100 lbs.

**SARA (SECTION 313 - TOXIC CHEMICAL):**

Hydrogen Sulfide – Under Administrative Stay and not currently reportable.

**CLEAN WATER ACT - PRIORITY POLLUTANTS:**

This product contains no known priority pollutants at concentrations greater than 0.1%

**CLEAN AIR ACT:**

VOLATILE ORGANIC COMPOUNDS (VOC)  
(EPA METHOD 24/24a):

None expected

SECTION 112(r) – Risk Management Plan

Hydrogen Sulfide (10,000 lbs.)

**CERCLA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT:  
2. HYDROGEN SULFIDE**

**(FOR COMPONENTS LISTED IN SECTION 2)**

RQ = 100 lbs

**RCRA (RESOURCE CONSERVATION & RECOVERY ACT) HAZARDOUS WASTE:**

Product not anticipated to become Hazardous Waste unless contaminated or mixed with other materials. Generator is responsible for proper characterization and disposal of waste.

**FDA:**

This product is **NOT** registered with the Food and Drug Administration (FDA).

**USDA:**

This product is **NOT** registered with the U.S. Department of Agriculture (USDA).

**CANADIAN REGULATORY INFORMATION:**

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):** This product conforms to the CEPA regulations.

**LISTED ON DOMESTIC SUBSTANCE LIST (DSL):** Sulfur is listed

**LISTED AS PRIORITY SUBSTANCE:** Components are **NOT** listed.

**LISTED AS TOXIC SUBSTANCE:** Components are **NOT** listed.

**EXPORT CONTROL LIST:** Components are **NOT** listed.

**LISTED ON NON-DOMESTIC SUBSTANCES LIST (NDSL):** Components are **NOT** listed.

**NATIONAL POLLUTANT RELEASE INVENTORY (NPRI):** Product components are subject to NPRI reporting.

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*.

**WORKPLACE HAZARDOUS INFORMATION SYSTEM (WHMIS):**

CONTROLLED

**CLASS:**

B4 – Flammable Solid

D-2B – Material causing other toxic effects (TOXIC)

**EUROPEAN/INTERNATIONAL REGULATIONS:**

**EUROPEAN INVENTORY OF EXISTING** 231-722-6 (for sulfur)

**COMMERCIAL SUBSTANCES (EINECS)** 231-977-3 (for hydrogen sulfide)

**NUMBER:**

**EUROPEAN PRIORITY LISTS:**

Chemical components are not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93 on the evaluation and control of the risks of existing substances) and are not listed in annex I of council regulation no. (EC) 304/2003.

**HAZARD SYMBOLS:**

**SULFUR – NONE**

**HYDROGEN SULFIDE**

F+ - EXTREMELY FLAMMABLE

T+ - VERY TOXIC

N – DANGEROUS FOR THE ENVIRONMENT

**RISK PHRASES (for hydrogen sulfide):**

**R12** – Extremely flammable.

**R26** – Very toxic by inhalation.

**R50** – Very toxic to aquatic organisms.

**SAFETY PHRASES (for hydrogen sulfide):**

**S9** – Keep container in well ventilated place.

**S16** – Keep away from sources of ignition – No smoking.

**S36** – Wear suitable protective clothing.

**S38** – In case of insufficient ventilation, wear suitable respiratory protection.

**S45** – In case of accident or if you feel unwell, seek medical advice immediately.

**S61** – Avoid release to the environment. Refer to Safety Data Sheets.

## SECTION 16 - OTHER INFORMATION

**OTHER PRECAUTIONS:** None Known

**STATE REGULATORY INFORMATION:**

**SULFUR**

**MASSACHUSETTS SUBSTANCES LIST:** Listed  
**NEW JERSEY RIGHT TO KNOW (RTK) SUBSTANCE NUMBER:** 1757  
**PENNSYLVANIA HAZARDOUS SUBSTANCE LIST:** Listed  
**RHODE ISLAND HAZARDOUS SUBSTANCE LIST:** Listed (F – NFPA)

**HYDROGEN SULFIDE**

**MASSACHUSETTS SUBSTANCES LIST:** Listed (Extraordinarily Hazardous)  
**NEW JERSEY RIGHT TO KNOW (RTK) SUBSTANCE NUMBER:** 1017  
**PENNSYLVANIA HAZARDOUS SUBSTANCE LIST:** Environmental Hazard  
**RHODE ISLAND HAZARDOUS SUBSTANCE LIST:** Listed (T- ACGIH, F – NFPA)

**CALIFORNIA PROPOSITION 65:** Product components are not listed.

**LABEL INFORMATION:**

**LABEL HAZARDS:**

**WARNING!** *FLAMMABLE SOLID! HOT MOLTEN SULFUR WILL CAUSE SEVERE BURNS.*

**WARNING!** *VAPOR SPACE IN CONTAINERS MAY CONTAIN TOXIC CONCENTRATIONS OF HYDROGEN SULFIDE. HYDROGEN SULFIDE IS VERY FLAMMABLE AND EVEN EXPLOSIVE UNDER CERTAIN CONDITIONS.*

**LABEL PRECAUTIONS:**

WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT TO AVOID CONTACT WITH EYES AND SKIN AND TO AVOID INHALATION OF DUST AND VAPORS.

USE WITH ADEQUATE VENTILATION.

USE EXTREME CAUTION WHEN OPENING CLOSED CONTAINERS OR SPACES

AVOID GENERATION OF DUST.

KEEP AWAY FROM IGNITION SOURCES

♦ - indicates change from previous MSDS

**ACRONYMS/REFERENCES:**

ACGIH – American Conference of Governmental Industrial Hygienists  
CAS – Chemical Abstract Service  
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act  
DOT – Department of Transportation (U.S.)  
EC – Effective Concentration (where desired endpoint observed)  
EEC – European Economic Community  
EPA – Environmental Protection Agency  
g/m<sup>3</sup> – grams per cubic meter  
HMIS - Hazardous Materials Identification System  
IARC - International Agency for Research on Cancer  
LC – Lethal Concentration  
LD – Lethal Dose  
mg/m<sup>3</sup> – milligrams per cubic meter  
mg/kg – milligrams per kilogram  
mg/l – milligrams per liter  
NIOSH – National Institute for Occupational Safety and Health  
MSDS – Material Safety Data Sheet  
NOEC – No Observed Effect Concentration  
NTP – National Toxicology Program  
OSHA – Occupational Safety and Health Administration  
RCRA – Resource Conservation and Recovery Act  
RQ – Reportable Quantity  
SARA – Superfund Amendments and Reauthorization Act  
TWA – Time weighted average (8-hour)  
UN/NA – United Nations/North America  
WHMIS – Workplace Hazardous Materials Information System (Canada)  
WT. % - Weight Percent

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