Section1: Product Information

Product Name:	Molten Sulfur
Manufacturer:	MONTANA SULPHUR &CHEMICAL COMPANY P.O. BOX 31118, Billings, Montana USA 59107-1118 Offices and Plant located at 627 Exxon Mobil Road, Billings, Montana 59101 **Emergency Telephone Number: (406) 252-7101** Telephone (406) 252-9324 Fax (406) 252-8250 E-Mail: sales@montanasulphur.com
Chemical Name:	Sulfur
Chemical Formula:	S
EPA TOSCA & CAS Reg. No.:	7704-34-9; STC Code 49 457 70
Synonyms:	Brimstone, Crude Sulfur, Elemental Sulfur, Sulphur, Sulfur

Section 2: Hazard Identification

Emergency Overview:	Molten Sulfur can cause thermal burns May contain or possibly release poisonous Hydrogen Sulfide (H_2S) Can Cause Irritation to eyes, skin, and respiratory tract
Routes of Entry:	Skin or eye contact, inhalation or ingestion
Potential Effects:	May Cause eye or skin irritation. Molten product can cause severe thermal burns. If product is ingested it could cause mild irritation. If the product is ingested while still molten it will cause severe thermal burns. Inhalation may cause irritation to respiratory system. Inhalation of any possible Hydrogen Sulfide vapors is extremely hazardous and can cause death. Medical Conditions that may be aggravated by exposure to fumes/hydrogen sulfide/sulfur oxides include respiratory disease or infections; cardiovascular diseases. [It should be noted however that this company has successfully employed selected persons with pre-existing heart disease and emphysema without adverse results and that sulfur has been known and used since antiquity with remarkable safety]. Sulfur is NOT listed as Carcinogen or Potential Carcinogen under the National Toxicology Program of IARC or OSHA.

Section 3: Composition / Information on Ingredients

Name	CAS #	% by weight
Sulfur	7704-34-9	>99.0
Hydrogen Sulfide	7783-06-4	< 1%

Section 4: First Aid Measures

Eyes:	Immediately flush eyes with large amounts of water for at least 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention if irritation persists.
Skin:	Wash affected area with soap and water. Obtain medical attention if irritation remains.
Inhalation:	Remove the victim to fresh air. Administer artificial respiration if breathing has stopped. Keep victim at rest. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. IMMEDIATELY obtain medical attention.
Ingestion:	If ingested consult a physician. Sulfur is not considered highly toxic. Has been used medically in years past in "laxatives, alterative, antiseptics, antiparasitics" and is a component of animal feeds.

IMMEDIATELY transport victim to an emergency facility.
Have emergency eyewash station / safety shower available in work area.

Section 5: Fire Fighting Measures

Auto-ignition point (air): 478-511 degrees F.; Flash Point: 335+F.
Flammable Limits: LEL Dust 35 g/m3; UEL Dust 1400 g/m3.
NOTE: May vary considerably depending on particle size and dispersion.
NOTE: With any combustible material near or above the Flash Point, due consideration should be given to the possibilities for hot vapors traveling to a remote source of ignition and flashing back (while remaining above the flash point and LEL).

Extinguishing media: Use water, water fog, dirt, sand, or a carbon dioxide blanket to extinguish a fire. Hi-velocity jets of water or gas should be avoided as these will tend to spread and splash burning material over a larger area. Gentle water sprays or flooding work best. Fire inside tank cars can be smothered by simply closing the dome cover, thus closing off the air supply.

Special fire-fighting procedures: Protect product and containers from ignition during nearby fires if possible. As a precaution, keep exterior of tanks and bins cool with water spray to help prevent ignition and to help control sulfur fire if ignition occurs. If sulfur ignites: Stay upwind to avoid irritating-toxic sulfur dioxide gas. Protect skin from molten sulfur burns. Indoors, especially, wear self-contained breathing apparatus of the positive pressure type. Protect the eyes. Combustion products (sulfur dioxide) will cause severe coughing/eye & throat pain/and distress. DO NOT INHALE! Avoid raising dust. Once a fire is controlled, post fire watch for at least 4 hours. Small fires are easy to miss and can linger for hours. Re-ignition may occur.

Unusual fire and explosion hazards: Combustion product is sulfur dioxide, an irritating toxic gas which smells like burning match heads. Dust-air mixtures are highly flammable/explosive. Sulfur fires are deep blue at night, with very short flames. Fire is invisible by daylight except for smoke and heat. Burning material, however, turns a deep red-black.

Section 6: Accidental Release Measures

Allow product to solidify. Avoid sources of ignition. Have proper extinguishing media present. Utilize proper eye, face and respiratory protection. Wet down as needed to control dust

Section 7: Handling and Storage

Have fire fighting media at hand. Store solids outdoors or in a cool, vented area or an inert gas blanketed vessel. Avoid all sources of excessive heat and ignition. Avoid generating static electricity. Avoid explosive mixtures of dust and air. Handle sulfur with electrically grounded equipment. Enclosed equipment containing dust and air should be adequately explosion vented. Sulfur may be stored molten in steel or other compatible metallurgy in vented atmospheric pressure tanks or in pressure vessels. Avoid unnecessarily high or low temperatures in storage vessels and keep temperature below flash point.

Excessively low temperature accelerates corrosion. Be aware that in the presence of moisture over long periods of time, some of the sulfur will convert to sulfuric acid which is corrosive and will attack steel, metals, paper, concrete and wood products.

As with any hot material, violent generation of steam may result from introduction of water or other volatile liquids into the molten sulfur or the hot tanks. Serious burns could happen. Be sure vessels are properly vented or able to contain resulting steam pressures safely before introducing any water to such systems.

When unloading tank cars or trailers, be sure all connections are tight before pressuring lines. Stand well clear of nozzles and apertures from which molten sulfur may issue. Positively vent tank BEFORE heating or steaming. When opening tank cars/trailers, check carefully for pressure or vacuum before releasing all hatch hold downs. Covers may try to swing open forcefully and/or material or gas may eject forcefully – stand clear. Vent any gas pressure out of doors, stand upwind of discharge and DO NOT INHALE FUMES. Beware of potential poisonous gas hazard. Avoid overheating and over-pressuring tank cars/trailers. NEVER apply pressure in excess of vessel or steam coil ratings. Thoroughly melt all cargo before unloading is attempted. Avoid heating sulfur above 300 degrees F. during transfer operations. Once sulfur is

melted, unload by gravity or pressure. In pressure unloading, use regulated air or nitrogen pressure and NEVER more than rated pressure limit. Do NOT depend on installed transport tank pressure relief devices to limit pressure, because they may be plugged with solids. Violent rupture of the tank or other severe damage to personnel and property could occur from improper methods. Except in case of emergencies, the use of steam to pressure unload shipper's cars/trailers is prohibited by the shipper because excessive corrosion results. Steam must be used on the heating coils only.

Section 8: Exposure Control / Personal Protection

Work Area Ventilation: (1) Local exhaust, handle outdoors if practical or in closed systems. (2) Mechanical ventilation of indoor work areas recommended for controlling fumes and dust. If possibility of vapor or fume accumulation exists above the flammable limit, utilize explosion proof ventilating equipment to avoid toxic or explosive concentrations.

Protective Clothing: Leather or insulating cotton gloves, chemical resistant if dictated by other chemicals present. Long-sleeved shirts and pants to minimize skin contact.

Eye & Face Protection:	Dust tight safety goggles recommended where dust is likely to be present in irritating amounts. Face shield recommended when making/breaking connections to molten sulfur lines and steam coils.
Respiratory Protection:	Use appropriate NIOSH approved respirator if PEL'S for nuisance dust, hydrogen sulfide, and/or sulfur dioxide are exceeded.

For toxic gases we use full face positive pressure or pressure/demand supplied air or self contained breathing apparatus. Other masks may be suitable. Consult your safety equipment manufacturer or supplier.

Work & Hygienic Practices: When working with sulfur, wash exposed skin with soap and water after work periods and before breaks. Use clean work clothing each day.

Component	Exposure limits
Sulfur Dioxide	ACGIH TLV STEL: 5 ppm 15 minutes TWA: 2 ppm 8 hours NIOSH REL STEL: 5 ppm 15 minutes TWA: 2 ppm 10 hours OSHA PEL TWA: 5 ppm 8 hours
Hydrogen Sulfide	ACGIH TLV TWA: 10 ppm 8 hours STEL: 15 ppm 15 minutes NIOSH REL CEIL: 10 ppm 10 minutes OSHA PEL CEIL: 20 ppm AMP: 50 ppm 10 minutes
Sulfur (as dust)	ACGIH (Inhalable fraction) TWA: 10 mg/m3 8 hour(s). Form: Nuisance dust. OSHA PEL TWA: 15 mg/m3 8 hour(s). Form: Nuisance dust.

Section 9: Physical and Chemical Properties

Boiling Point: 832.3 F.; Vapor Pressure: 1.15 X 10[E-4] (mm.Hg) @ 140 F.; Vapor Density: >1 @ 830 F. (air=1); Specific Gravity: 2.07 @ 77 F.; Melting Point: 231 - 246 F.; Evaporation Rate:< 1 ether = 1;

Solubility in Water: Negligible.

Appearance and Odor: Bright yellow, minimal dust, odor very slight- may be sweet to mercaptan-like. Melted sulfur changes from lemon yellow color to orange to red to black as temperature increases. Strong sulfuric odor at liquid state. Viscosity increases rapidly with temperature, then falls back off with further temperature increase.

Section 10: Stability and Reactivity

Stability: Stable
Conditions to Avoid: Heat, Sparks, Flame, build up of Static Electricity.
Incompatibility (Materials to Avoid): Acids. Forms explosive mixtures with oxidizing agents. Alkalis and oxidizing agents such as chlorine and fluorine. May react explosively with ammonia, ammonium nitrate, chlorine dioxide, all inorganic perchlorates, sodium nitrate, and zinc.
Hazardous Polymerization: Will Not Occur.
Hazardous Decomposition Products: Sulfur oxides, Hydrogen Sulfide.

Section 11: Toxicological Information

Toxic effects on humans : Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), and inhalation (lung irritant).

Carcinogenic effects: No known significant effects or critical hazards.

Section 12: Ecological Information

The product itself and its products of degradation are not toxic.

Section 13: Disposal Considerations

Waste disposal: The generation of waste should be avoided or minimized wherever possible. Disposal of this product and any by-products must comply with all local, state, and federal requirements. Consult your local and/or regional authorities.

Section 14: Transport Information

For Domestic Shipments:
Shipping Description: Sulfur, Molten
Shipping Description: NA2448, SULFUR, MOLTEN, 9, PG III
Packaging References: 49CFR, Sections 172.504, 173.213, 173.247, 172.325 / SP 30
For International Shipments:
Commodity Name: Sulfur, Molten
Shipping Description: UN2448, SULFUR, MOLTEN, 4.1, PG III
Packaging References: 49CFR, Sections 172.504, 173.213, 173.247, 172.325

Section 15: Regulatory Information

U.S. Federal regulations:
TSCA 8(b) inventory: Sulfur
SARA 302/304/311/312 extremely hazardous substances: Sulfur Dioxide; Hydrogen Sulfide
SARA 302/304 emergency planning and notification: Sulfur Dioxide; Hydrogen Sulfide
SARA 302/304/311/312 hazardous chemicals: Sulfur Dioxide; Sulfur; Hydrogen Sulfide
SARA 311/312 MSDS (SDS) distribution - chemical inventory - hazard identification: Sulfur: Fire hazard and immediate (acute) health hazard
Clean Air Act (CAA) 112 accidental release prevention: Sulfur Dioxide; Hydrogen Sulfide
Clean Air Act (CAA) 112 regulated toxic substances: Sulfur Dioxide; Hydrogen Sulfide