



Section 1: Product Information

Product Name: Solid 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
Synonyms: Brimstone, Crude Sulfur, Elemental Sulfur, Sulphur, Sulfur, Lump Sulfur, Crushed Sulfur

Section 2: Hazard Identification

Emergency Overview: Molten Sulfur can cause thermal burns
May contain or possibly release poisonous Hydrogen Sulfide (H₂S)
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. If product is ingested it could cause mild irritation
Inhalation of dust 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

Elemental Sulfur, S-; Chemical Family: Sulfur.

Flaked, Sugarhouse & High Purity Prills 99.9% minimum S TLV-none established*
Lump or Crude varies ca.99% S TLV-none established*
Disintegrating types 90.0%** minimum S TLV-none established*
(for agriculture only) & 10.0%** maximum bentonite clay*

Disintegrating Type sulfur content may be different depending on formulation; consult actual package label, invoice, or manufacturer. Disintegrating type sulfurs are intended only for agricultural use as plant nutrient and soil amendment materials. The clays are used as an aid to produce disintegration in the soil. YELLOWSTONE BRAND 90% Disintegrating Sulfur for example is typically 90% (minimum Sulfur) and up to 10% clay/earth (bentonite)]

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. Prolonged contact with skin causes skin dryness.
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.

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: Mixtures of dust of any sulfur product suspended in air may also be easily ignited at all ambient temperatures by sparks

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. Damage can be minimized by smothering (closing off air) or with carbon dioxide flooding.

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

Avoid setting fire to spill material. Have proper extinguishing media present. Utilize proper eye, face and respiratory protection. Small spills may be cleaned up with a shovel and broom. Large spills may be cleaned up with front end loaders etc. however avoid dragging the blade on concrete or rocks as this could cause sparks that could ignite dust. Post a fire watch until danger of fire has passed.

Section 7: Handling and Storage

Handle loose product with well grounded non-sparking process/storage equipment. Dry sulfur materials generate static electricity and sparking during conveying or grinding. Avoid handling sulfur at high velocity in air. Inert gas blanketing is useful in preventing fires and explosions in processing and grinding equipment. Do not use near sparking equipment or open flames. When handling loose, bulk sulfur take special care to prevent steel forks, loader buckets etc. from dragging on concrete (sparks) and to prevent crushing the product with equipment which will create dust. Exclude rocks, sand, loose iron, and other tramp material from entering augers, elevator parts, or other mechanical handling systems. (Tramp material will cause sparking). Use good housekeeping practice; Do not allow large amounts of waste to accumulate. Enclosed equipment containing dust in air must be adequately explosion vented or strong enough to withstand the pressures developed in a dust explosion. Do not store near oxidizing materials, or near hot equipment. In the presence of moisture over long periods of time, some sulfur will convert to sulfuric acid which is corrosive to metals and attacks paper, concrete, wood products etc. Store in a dry place.

Section 8: Exposure Control / Personal Protection

Respiratory Protection:	Recommend dust masks suitable for use with nuisance dust. Indoor areas should have sufficient local exhaust to remove dust that is released into the air
Eye Protection:	Is recommended around dust for personal comfort
Skin & General:	Work gloves and long sleeved shirts etc. help keep material off of skin of persons prone to skin irritation and dermatitis. Use of a good skin moisturizer before and after to avert dry skin problems and discomfort. Be sure to select a skin care product which you are not allergic to.

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 (as dust)	ACGIH (Inhalable fraction) TWA: 10 mg/m ³ 8 hour(s). Form: Nuisance dust. OSHA PEL TWA: 15 mg/m ³ 8 hour(s). Form: Nuisance dust.
Bentonite may contain some free silica--- Silica	OSHA PEL TWA: 30mg/m ³ 8 hour(S)
Sulfur Dioxide (in the event of combustion)	OSHA PEL TWA: 5ppm ACGIH TLV:2ppm STEL: 5ppm

Section 9: Physical and Chemical Properties

Boiling Point: 832.3 F.;
Vapor Pressure: 1.15×10^{-4} (mm.Hg) @ 140 F.;
Vapor Density at boiling point: 0.2278 pounds/cubic foot
Specific Gravity: 2.07 @ 77 F.;
Melting Point: 231 - 246 F. depending on temperature history
Solubility in Water: nil;
Evaporation Rate: <<1 (either=1)

Appearance and Odor: Bright yellow flakes, crystals, pastilles, prills, powders or granules. Odor very slight-sweet to mercaptany. Melted sulfur changes from lemon yellow color to red to black as temperatures increase. A strong "sulfuric" odor is present in liquid state. Viscosity of molten sulfur increases rapidly with temperature and then falls back off with further temperature increase.

Note: Yellowstone Brand Disintegrating Sulfur is a pale greenish yellow color rather than yellow and may have an ammonia-like odor.

Section 10: Stability and Reactivity

Stability: Stable

Conditions to Avoid: mixtures of air and sulfur dust, sparks or open flames, mixtures of sulfur and oxidizing agents (other than sulfur) in general, large accumulations of sulfur dust which could become airborne in an explosion or process disruption caused by other materials. Examples of common oxidizing agents are PERCHLORATES, NITRATES, CHLORATES, PERMANGANATES, PEROXIDES, OXYGEN, HALOGENS, etc. Good housekeeping is important to minimize fire danger.

General Information: Solid sulfur is satisfactorily compatible with common materials of construction including steel and aluminum. Molten sulfur may attack and degrade rubber and some plastics. At still higher temperatures sulfur will react with hydrocarbons evolving poisonous hydrogen sulfide gas in the absence of air. The gas is also flammable. Sulfur is both an OXIDIZING AGENT and a REDUCING AGENT. Sulfur will form sulfides with most metals, including iron, and reacts vigorously with metals in the Sodium and Magnesium groups on the periodic table. Sulfides of iron will oxidize fairly rapidly in moist air. In the presence of other readily oxidized combustibles (such as some oily materials) under certain conditions, the heat liberated may be sufficient to result in spontaneous ignition. This phenomenon has not been observed with these pure Sulfur products or Disintegrating Sulfur in contact with unprotected steel at ordinary ambient temperatures, however. Users are cautioned against allowing inadvertent mixtures of sulfur, iron, and miscellaneous oils to remain. Oxidation is accelerated by higher temperatures. Heat buildup and ignition can be prevented by keeping the sulfides wet until oxidation is complete. The literature on sulfur is extensive. Consult a chemist before compounding.

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

Shipping Description: NA1350, SULFUR, 9, PG III

For International Shipments:

Commodity Name: Sulfur

Shipping Description: UN2448, SULFUR, 4.1, PG III

Packaging References: 49CFR, Sections 172.102(c)(1)

Packaged sulfur is NOT considered Hazardous Material per 49CFR, Sections 172.102(c)(1)

Section 15: Regulatory Information

U.S. Federal regulations:

Clean Air Act (CAA) 112 accidental release prevention: Sulfur Dioxide; Hydrogen Sulfide

Clean Air Act (CAA) 112 regulated toxic substances: Sulfur Dioxide; Hydrogen Sulfide

Section 16: Other Information

Hazardous Material Information System (HMIS) National Fire Protection Association (NFPA)

Health	2
Fire hazard	1
Physical Hazard	0
Personal protection	G

