

MATERIAL SAFETY DATA SHEET

AS-7

Martin Operating Partnership, L.P.
P.O. Box 191
Kilgore, Texas 75663

EMERGENCY ASSISTANCE
MGS - 1-800-256-4421
CHEMTREC: (800) 424-9300

HAZARD RATING SYSTEM:

NFPA 704	HMIS	KEY
1	1	4=SEVERE
1	1	3=SERIOUS
0	1	2=MODERATE
		1=SLIGHT
		0=MINIMAL

A. PRODUCT IDENTIFICATION

Synonyms:	Emulsified Sulfur, Flowable Sulfur
Chemical Name:	Sulfur
Chemical Family:	Non-Metallic Element
Chemical Formula:	S
CAS Reg. No.:	7704-34-9

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product has been introduced into U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals in Commerce; hence, it is subject to all applicable provisions and restrictions under TSCA 40 CFR, Section 721 and 723.250.

B. HAZARDOUS COMPONENTS

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV	Units
Sulfur	7704-34-9	70	N.E.	N.E.	N.A.

N.E. -Not Established

N.A. -Not Applicable

C. PERSONAL PROTECTION INFORMATION

Ventilation:	Use adequate ventilation to control exposure. Avoid inhalation of dust or liquid aerosol.
Respiratory Protection:	Not generally required. When entering areas containing unknown concentrations, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA). Avoid breathing spray mist.
Eye Protection:	Dust-proof goggles or safety glasses with side shields. Do not wear contact lenses in work areas.
Skin Protection:	Chemical-resistant gloves and clothing are recommended to avoid prolonged contact. Avoid unnecessary skin contact.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. HANDLING AND STORAGE PRECAUTIONS

Store in a cool, dry, well-ventilated area, away from incompatible chemicals. Keep away from fire, sparks and flame. AS-7 is corrosive to ferrous and mild steel materials. All handling and storage equipment should be constructed of stainless steel, aluminum, or poly-type materials. Keep containers closed and electrostatically grounded. Storage temperatures should be above 32°F. AS-7 should be stored in a closed system with mild agitation or circulation.

E. REACTIVITY DATA

Stability:	Stable
Conditions to Avoid:	Heat, Sparks, Flame, build up of Static Electricity.
Incompatibility (Materials to Avoid):	Acids, Alkalies, Ammonia compounds, Carbides, Halogens, Metals, Oxygen and Strong Oxidizing agents. Forms explosive mixtures with oxidizing agents.
Hazardous Polymerization:	Will Not Occur.
Hazardous Decomposition Products:	Sulfur oxides, Hydrogen Sulfide.

F. HEALTH HAZARD DATA

1. Recommended Exposure Limits: See Section B

2. Acute Effects of Overexposure:

Eye: Exposure to sulfur dust can cause eye irritation, characterized by burning, lacrimation, blurred vision, keratitis, and losses of corneal epithelium. Similar effects can be expected for exposure to AS-7 liquid aerosol.

Skin: Exposure to dust can cause skin irritation. Symptoms include reddening, itching, and inflammation. Similar effects can be expected for exposure to AS-7 liquid aerosol.

Inhalation: Sulfur dust is irritating to mucous membranes of respiratory tract. May cause coughing, sore throat, and shortness of breath. Similar effects can be expected for exposure to AS-7 liquid aerosol.

Ingestion: Large doses can cause gastrointestinal irritation, nausea, vomiting, and diarrhea. Ingestion of greater than 15 grams may cause production of hydrogen sulfide from bacterial action in colon. Hydrogen sulfide thus produced can cause effects on central nervous system, including convulsions, changes in blood pressure and respiration, respiratory arrest, and possibly death.

3. Subchronic and Chronic Effects of Overexposure

Skin sensitization has been observed in some people after repeated exposures. Chronic inhalation may cause bronchopulmonary disease which may be complicated by emphysema and bronchiectasis. No evidence for carcinogenicity according to NTP, IARC, NIOSH, OSHA, or ACGIH.

4. Other Health Effects:

None of note.

5. Health Hazard Categories:

	Animal		Human			Animal		Human	
Known Carcinogen	—	—			Toxic	—	—		
Suspect Carcinogen	—	—			Corrosive	—	—		
Mutagen	—	—			Irritant	—	<u>X</u>		
Tumorigen	—	—			Target Organ Toxin	—	<u>X</u>		
Teratogen	—	—			Specify: eye, respiratory tract			irritation	
Allergic Sensitizer	—	—							
Highly Toxic	—	—							

6. First Aid and Emergency procedures:

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes. Get medical attention.

Skin: Wash affected area with soap and water. Material is not absorbed through skin.

Inhalation: Remove the victim to fresh air. Administer artificial respiration if breathing has stopped. Keep victim at rest. Call for prompt medical attention.

Ingestion: Never give anything by mouth to anyone who is unconscious or convulsing. Give victim about 16 ounces of water. Induce vomiting if victim is responsive. This is most effective within 30 minutes of ingestion.

Have emergency eyewash station available in work area.

G. PHYSICAL DATA

Appearance:	Viscous, yellow to tan liquid
Odor:	Odor of sulfur dioxide
Melting Point:	246°F
Boiling Point:	831°F at 1 atm
Vapor Pressure:	1 mm Hg at 363°F
Vapor Density (Air = 1):	Not Available
Solubility in Water:	Insoluble
Specific Gravity (H ₂ O = 1):	1.5
Percent Volatile by Volume:	nearly zero
Evaporation Rate (Ethyl Ether = 1):	negligible
Viscosity:	Thixotropic fluid

H. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	405°F (CC)
Autoignition Temperature:	450°F
Flammable Limits (grams/m ³ in Air):	LEL -35 UEL - 1400
Fire Extinguishing Media:	Dry Chemical, Foam, Carbon Dioxide (CO ₂), and Water (Fog or Spray Pattern)
Special Fire Fighting Procedures:	Cool down with water and smother with steam, foam, or dry chemical.

Generally low hazard potential. Liquid can burn upon heating to temperatures at or above flash point. Material can accumulate static charges which can cause ignition of accumulated flammable or explosive gases or vapors.

Evacuate area of all unnecessary personnel. Use NIOSH/MSHA approved self-contained breathing apparatus and other protective equipment and/or garments described in Section C if conditions warrant. Sulfur burns with a faint blue flame that may be nearly invisible under certain lighting conditions. Isolate material from fire if possible. Water fog or spray may be used to extinguish fire because the material can be cooled below its flash point. Liquid sulfur in open containers may be extinguished with a fine spray of water. Use of high pressure hose streams must be avoided because of the risk of splattering or causing a steam explosion. Keep quantity of water used to a minimum. Fires in storage tanks can be extinguished by shutting off vents to exclude air. Allow tank contents to cool to below 310°F before opening again.

Fire and Explosion Hazards:

AS-7 is not a fire or explosion hazard, but sulfur dust may explode when exposed to ignition source. Do not mix water with molten material.

I. SPILL, LEAK AND DISPOSAL PROCEDURES

Precautions required if material is released or spilled:

Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C, if conditions warrant. Small spills can be absorbed with clay. Do not allow spill to reach waterways or sewers. Any spill or release that exceeds the reportable quantity must be reported to local, state, and federal emergency response agencies.

Waste Disposal: Proper land disposal.

J. DOT TRANSPORTATION

Commodity Name: AS-7
Shipping Description: AS-7
Packaging References: Exempt from requirements (49CFR172. 10 1F(1 2)(iv))

K. OTHER REGULATORY INFORMATION

Hazardous Substance/RQ - Not Applicable

L. PROTECTION REQUIRED FOR WORK ON CONTAMINATED EQUIPMENT

Contact immediate supervisor for specific instruction before work is initiated. Wear protective equipment and/or garments described in Section C if exposure conditions warrant.

M. HAZARD CLASSIFICATION

This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

- | | | |
|--------------------------|-----------------------------|------------------|
| — Combustible Liquid | — Flammable Aerosol | — Oxidizer |
| — Compressed Gas | — Explosive | — Pyrophoric |
| — Flammable Gas | — Health Hazard (Section F) | — Unstable |
| — Flammable Liquid | — Organic Peroxide | — Water Reactive |
| <u>X</u> Flammable Solid | | |

- Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

N. ADDITIONAL COMMENTS

None.

O. LEGAL DISCLAIMER

While the information contained in the MSDS is believed to be reliable, no guarantee is made as to its accuracy or completeness. The conditions of use, handling, storage, and disposal, and the suitability of the product for particular uses are beyond our control. Consequently, the user assumes all risks involving the use of the product. We expressly disclaim all warranties of every kind and nature, express or implied, including the warranties of merchantability and fitness for a particular purpose.



PRODUCT INFORMATION SHEET

AS-I PRODUCT DATA

DESCRIPTION

AS-7, an aqueous suspension of microfine sulfur, was developed for use in the kraft process. It is a stabilized, low viscosity slurry through a broad range of temperatures. These properties allow easy handling, storage, and metering. Emulsifying and stabilizing agents used in the manufacture of AS-7 are compatible with the kraft process.

PROPERTIES

PHYSICAL FORM:	A flowable aqueous suspension of emulsified sulfur.
TOTAL SOLIDS:	71% by weight, plus or minus 1%.
SULFUR SOLIDS:	70% by weight.
VISCOSITY:	AS-7 is thixotropic; viscosity Varies with shear
PARTICLE SIZE:	Less than 5 microns.
WEIGHT PER GALLON:	13.2 lbs.
pH:	8.2 to 8.6
SOLVENT CARRIER:	Water
FREEZING POINT:	0C

HANDLING AND STORAGE

AS-7 can be shipped by truck or rail cars up to 100 tons with an optional top or bottom unloading system. All handling and storage equipment should be constructed of stainless steel, aluminum or poly type materials, as AS-7 is corrosive to ferrous and mild steel material. AS-7 must be stored at temperatures above 0 C. AS-7 should be stored in a closed system with mild agitation or circulation.



AS-7 SULFUR SLURRY

FDA APPROVALS

The FDA approvals on AS-7 sulfur slurry are as follows:

Main Heading	21 CFTR
Approvals	176.70
	178.3120
	176.120
	176.180

These approvals apply where direct contact with food is involved.