

# SAFETY DATA SHEET



Revision Date 18-Aug-2017

SDS Number 888100004458

Revision Number 1.02

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

**Product Name** Sulfur, Prill

**Synonyms** Sulfur Block, Brimstone, Sulphur

**Recommended Use** Refining byproduct  
**Uses advised against** All others

**Manufacturer**  
Tesoro Refining & Marketing Co.  
19100 Ridgewood Parkway  
San Antonio, TX 78259

**Emergency Telephone** Chemtrec: 1-800-424-9300  
Tesoro Call Center: 1-877-783-7676

**E-mail address** ProductStewardship@TSOCORP.com

## 2. HAZARDS IDENTIFICATION

### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable solids	Category 2
Skin Corrosion/Irritation Category	Category 2
Chronic Aquatic Toxicity	Category 3

### Label elements

#### **Warning**

Flammable solid  
Causes skin irritation  
Harmful to aquatic life with long lasting effects



**Appearance** Solid

**Physical State @20°C** Solid

**Odor** None

### Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling  
Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
Ground/or bond container and receiving equipment  
Use explosion-proof electrical/ ventilating / lighting / equipment  
Wear protective gloves/eye protection/face protection

IF ON SKIN: Wash with plenty of water and soap  
If skin irritation occurs: Get medical advice/attention  
Take off contaminated clothing and wash it before reuse  
In case of fire: Use CO<sub>2</sub>, dry chemical, or foam to extinguish

### Hazards not otherwise classified (HNOC)

Not applicable

### Other Information

May be harmful if swallowed. May be harmful in contact with skin. Harmful to aquatic life.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Percent
Sulfur	7704-34-9	0-100
Hydrogen Sulfide	7783-06-4	0<1

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Remove to fresh air. Artificial respiration and/or oxygen may be necessary. Get medical attention immediately if symptoms occur.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water for at least 15 minutes. After contact with molten product, cool skin area rapidly with cold water. Do not try to removed solidified material from the skin. Removal of solidified molten material from skin requires medical assistance. Get immediate medical advice/attention.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.
<b>Self-protection of the first aider</b>	Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8).

### Most important symptoms and effects, both acute and delayed

### Indication of any immediate medical attention and special treatment needed

**Note to physicians** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media** Dry chemical, CO<sub>2</sub>, sand, earth, water spray or regular foam.

<b>Small Fire</b>	Use dry sand, dry chemical or alcohol-resistant foam to extinguish.			
<b>Large Fire</b>	Use dry sand, dry chemical or alcohol-resistant foam to extinguish.			
<b>Unsuitable extinguishing media</b>	Do not use straight streams. Do not scatter spilled material with high pressure water streams. Do not spray water directly into containers due to danger of boil over.			
<b>Specific hazards arising from the chemical</b>	Toxic fumes of sulfur dioxide will result from combustion.			
<b>Hazardous combustion products</b>	Oxides of sulfur.			
<b>Explosion data</b>				
<b>Sensitivity to Mechanical Impact</b>	None.			
<b>Sensitivity to Static Discharge</b>	No.			
<b>Special protective equipment for fire-fighters</b>	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn.			
<b>Further information</b>	None.			
<b><u>NFPA</u></b>	<b>Health hazards</b> 1	<b>Flammability</b> 1	<b>Stability</b> 0	<b>Physical and chemical properties</b> -

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

<b>Personal precautions</b>	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.
<b>Other Information</b>	Refer to protective measures listed in Sections 7 and 8.

### Environmental precautions

<b>Environmental precautions</b>	Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.
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### Methods and material for containment and cleaning up

<b>Methods for containment</b>	Dike far ahead of spill; use dry sand to contain the flow of material.
<b>Methods for cleaning up</b>	Pick up and transfer to properly labeled containers.
<b>Prevention of secondary hazards</b>	Clean contaminated objects and areas thoroughly observing environmental regulations.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

<b>Advice on safe handling</b>	Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Avoid generation of dust. Fine dust dispersed in air, in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Toxic concentrations of hydrogen sulfide may accumulate in tanks and bulk transport compartments.
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### Conditions for safe storage, including any incompatibilities

**Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Store in accordance with local regulations.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL
Hydrogen Sulfide 7783-06-4	STEL: 5 ppm TWA: 1 ppm	(vacated) TWA: 10 ppm (vacated) TWA: 14 mg/m <sup>3</sup> (vacated) STEL: 15 ppm (vacated) STEL: 21 mg/m <sup>3</sup> Ceiling: 20 ppm

NOTE: Limits shown for guidance only. For additional information, OSHA's 1989 air contaminants standard exposure limits provided even though the limits were vacated in 1992. State, local or other agencies or advisory groups may have established more stringent limits. Follow applicable regulations.

**Appropriate engineering controls**

**Engineering controls**                      Showers  
    Eyewash stations  
    Ventilation systems.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**                      Tight sealing safety goggles.

**Hand Protection**                              Wear suitable gloves. Impervious gloves.

**Skin and body protection**                      Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.  
 Antistatic boots.

**Respiratory protection**                      When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a NIOSH approved respirator when there is a potential for airborne concentrations to exceed occupational exposure limits. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2, NIOSH Respirator Decision Logic, and the respirator manufacturer for additional guidance on respiratory protection selection. A Self-Contained Breathing Apparatus (SCBA) should be used for fire fighting. Use a NIOSH approved positive-pressure supplied air respirator if there is a potential for uncontrolled release, exposure levels are unknown, in oxygen deficient (less than 19.5% oxygen), or any other circumstance where an air-purifying respirator may not provide adequate protection.

**General hygiene considerations**                      Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Wear suitable gloves and eye/face protection.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

**Physical State @20°C**                      Solid  
**Appearance**                                      Solid  
**Odor**    None  
**Color**    Yellow  
**Odor threshold**                                      May release H<sub>2</sub>S with 10 ppb or less odor threshold

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	Not applicable	
Melting point / freezing point	107 °C / 225 °F	
Boiling range	445 °C	
Flash point	167 °C / 333 °F	

Evaporation rate	No data available
Flammability (solid, gas)	Solid
Flammability Limit in Air %	
Upper flammability limit:	No data available
Lower flammability limit:	No data available
Vapor pressure	1.3
Vapor density	No data available
Relative density	2.1
Water solubility	Insoluble in water
Solubility in other solvents	No data available
Partition coefficient	No data available
Autoignition temperature	235 °C / 455 °F
Decomposition temperature	No data available
Kinematic viscosity	No data available
Dynamic viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available
Minimum Ignition Energy (mJ)	< 1mJ
K <sub>st</sub> (bar.m/s)	No data available
Softening point	No data available
VOC Content (%)	No data available
Density	No data available
Bulk density	Not applicable
Conductivity	No data available

## 10. STABILITY AND REACTIVITY

Reactivity	This product is non-reactive under normal conditions.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong acids. Strong bases. Strong oxidizing agents.
Hazardous decomposition products	SULFUR DIOXIDE.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation	Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract.
Eye contact	Specific test data for the substance or mixture is not available. Irritating to eyes. (based on components).
Skin contact	Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).
Ingestion	Specific test data for the substance or mixture is not available. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

### Information on toxicological effects

Symptoms	Redness. May cause redness and tearing of the eyes.
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### Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 3,003.00 mg/kg  
 ATEmix (dermal) 2,002.00 mg/kg  
 ATEmix (inhalation-gas) 35,512.76 mg/l  
 ATEmix (inhalation-dust/mist) 5.01 mg/l

Chemical Name	Oral LD50	LD50/dermal/rat - NO UNITS (Wizards mg/kg)	Inhalation LC50
Sulfur 7704-34-9	> 3000 mg/kg ( Rat )	> 2000 mg/kg ( Rabbit )	> 9.23 mg/L ( Rat ) 4 h
Hydrogen Sulfide 7783-06-4	-	-	= 700 mg/m <sup>3</sup> ( Rat ) 4 h

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Chemical Name  
Hydrogen Sulfide**

Hydrogen Sulfide may be fatal if inhaled. The nervous system and respiratory tract are the main targets of hydrogen sulfide toxicity. Short term (acute) overexposure may cause irritation to the eyes, nose or throat. At high enough levels, effects on the nervous system include headaches, poor concentration, poor memory, unconsciousness, and death. Hydrogen sulfide has a strong odor that is characteristic of rotten eggs; however, the odor is not a reliable warning property as olfactory fatigue occurs at high levels. Respiratory distress or arrest can occur at high concentrations. Direct contact of the liquid with skin can cause frostbite; contact with the eyes can cause redness or severe burns. Cardiovascular effects have also been observed. NIOSH has determined that 100 ppm is immediately dangerous to life and health.

**Health hazard and classification information**

**Skin Corrosion/Irritation Category** Classification based on data available for ingredients. Irritating to skin.

**Serious eye damage/eye irritation** No information available.  
 No information available.

**Germ cell mutagenicity** No information available.

**Carcinogenicity** No information available.

**Reproductive toxicity** No information available.

**Target Organ Systemic Toxicant - Single Exposure** No information available.

**Target Organ Systemic Toxicant - Repeated Exposure** No information available.

**Target organ effects** Respiratory system, Eyes, Central nervous system.

**Aspiration hazard** No information available.

**12. ECOLOGICAL INFORMATION**

**Additional Ecological Information** Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number to the U.S. Coast Guard National Response Center is (800) 424-8802

**Ecotoxicity** Harmful to aquatic life with long lasting effects.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Sulfur 7704-34-9	-	14: 96 h Lepomis macrochirus mg/L LC50 static 866: 96 h Brachydanio rerio mg/L LC50 static 180: 96 h Oncorhynchus mykiss mg/L LC50 static	-	-
Hydrogen Sulfide 7783-06-4	-	0.016: 96 h Pimephales promelas mg/L LC50 flow-through 0.0448: 96 h Lepomis macrochirus mg/L LC50 flow-through	-	0.022: 96 h Gammarus pseudolimnaeus mg/L LC50

**Persistence and degradability** No information available.

**Bioaccumulation** There is no data for this product.

**Component Information**

Chemical Name	Partition coefficient
Hydrogen Sulfide 7783-06-4	0.45

**Other adverse effects** No information available.

### 13. DISPOSAL CONSIDERATIONS

**Waste treatment methods**

**Waste from residues/unused products** Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

**Contaminated packaging** Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

**US EPA Waste Number** U135

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Hydrogen Sulfide 7783-06-4	U135	-	-	U135

### 14. TRANSPORT INFORMATION

**DOT**

**UN/ID no** UN1350  
**Proper Shipping Name** SULFUR  
**Hazard Class** 4.1  
**Packing group** III  
**Reportable Quantity (RQ)** (Hydrogen sulfide (H2S): RQ (kg)= 45.40)  
**Special Provisions** 30, B120, IB8, IP3, T1, TP33  
**Description** UN1350, SULFUR, 4.1, III  
**Emergency Response Guide Number** 133

**TDG**

<b>UN/ID no</b>	UN1350
<b>Proper Shipping Name</b>	SULFUR
<b>Hazard Class</b>	4.1
<b>Packing group</b>	III
<b>Description</b>	UN1350, SULFUR, 4.1, III

**MEX**

<b>UN/ID no</b>	UN1350
<b>Proper Shipping Name</b>	Sulphur
<b>Hazard Class</b>	4.1
<b>Special Provisions</b>	242
<b>Packing group</b>	III
<b>Description</b>	UN1350, SULPHUR, 4.1, III

**IATA**

<b>UN/ID no</b>	UN1350
<b>Proper Shipping Name</b>	Sulphur
<b>Hazard Class</b>	4.1
<b>Packing group</b>	III
<b>ERG Code</b>	3L
<b>Description</b>	UN1350, SULPHUR, 4.1, III

**IMDG**

<b>UN/ID no</b>	UN1350
<b>Proper Shipping Name</b>	Sulphur
<b>Hazard Class</b>	4.1
<b>Packing group</b>	III
<b>EmS No.</b>	F-A, S-G
<b>Special Provisions</b>	242, 967
<b>Description</b>	UN1350, SULPHUR, 4.1, III

**15. REGULATORY INFORMATION**

**International Inventories**

<b>TSCA</b>	Listed
<b>DSL/NDSL</b>	Listed
<b>ENCS</b>	Not Listed
<b>IECSC</b>	Listed
<b>KECL</b>	Listed
<b>PICCS</b>	Listed
<b>AICS</b>	Listed

**Legend:**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

**US Federal Regulations**

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	No
<b>Fire hazard</b>	Yes
<b>Sudden release of pressure hazard</b>	No



Reactive Hazard

No

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Hydrogen Sulfide 7783-06-4	100 lb	-	-	X

**CERCLA**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**

**US State Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Sulfur 7704-34-9	X	X	X
Hydrogen Sulfide 7783-06-4	X	X	X

**16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION**

Revision Date 18-Aug-2017  
Revision Note No information available.

**Disclaimer**

Tesoro Companies, Inc. (Tesoro) provides the information on this Safety Data Sheet (SDS) in order to meet its obligations under 29 CFR 1910.1200, and does not hereby make any guarantee of product specifications or suitability for any particular purpose. Tesoro does not assume any liability arising out of the use of Tesoro's product or the use of information provided on this SDS. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all relevant information in the format of this document, since additional information may be necessary under exceptional conditions of use, and since Tesoro prepared this SDS based on information available on the date of its publication.

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End of Safety Data Sheet