

# SAFETY DATA SHEET

## MODIFY

Version 1 Dated 1/04/2011

### 1. PRODUCT AND COMPANY IDENTIFICATION

- 1.1 Product Identifier: SOLID SULPHUR - REACH Pre Reg. No: 05-2114097925-320000
- 1.2 Identified Uses: Agriculture, rubber, polymer and automotive industries.
- 1.3 Company: **J & S Technical Services Limited Marle Place, Brenchley, Tonbridge, Kent TN12 7HS United Kingdom**
- 1.4 Emergency Contact: **+44 (0)1270 502891**

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the Substance:

**Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**

Flam. Sol. 2, H228

Skin Irritation, Category 2, H315

For the full text of the H-Statements mentioned in this section, see Section 16

**Classification in accordance with Directive 67/548/EEC or 1999/45/EC**

Xi; R38

For the full text of the H-Statements mentioned in this section, see Section 16

#### 2.2 Label Elements:

**Labelling (Regulation (EC) No 1272/2008)**

*Hazard pictograms*



*Signal word*

Warning

*Hazard Statements*

H228 Flammable solid

H315 Causes skin irritation

*Precautionary Statements*

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse.

## 2.3 Other Hazards

P210 - Keep away from heat/sparks/open flames/hot surfaces - No smoking  
P241 - Use explosion-proof electrical/ventilation/lighting equipment when handling  
Sulphur

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Common Chemical Name	Sulphur
Formula	S (Hill)
Synonyms	Brimstone
Chemical Family	Non-metallic element of group VI
EC-No.	231-722-6
CAS Number	7704-34-9

## 4. FIRST AID MEASURES

### 4.1 Description of First Aid Measures

**Eyes:** In the event of contact with eyes, precautionary measures should be taken before the onset of symptoms, which may not occur for some hours. As soon as contact has taken place, wash the eye thoroughly with water for at least 15 minutes, holding the eye open for better irrigation. If any discomfort persists seek medical attention

**Inhalation:** Should irritation of the respiratory tract occur following inhalation, or if breathing becomes irregular, seek medical advice. If breathing ceases, artificial respiration must be administered and urgent medical help sought

**Skin:** Following contact with the skin, wash off thoroughly. Remove contaminated clothing.

**Ingestion:** Action is not normally required unless a large quantity is involved. In this case, precautionary medical advice may be needed  
Doctors should note that cases of poisoning may be caused by ingestion, intravenous and intraperitoneal routes. Dust can cause an eye irritant, and inhalation of dust may cause irritation of mucous membranes

**4.2 Most Important symptoms and effects, both acute and delayed**  
irritant effects, Diarrhoea

**4.3 Indication of immediate medical attention and special treatment needed**  
None known.

## 5. FIRE FIGHTING MEASURES

### 5.1 Extinguishing Media

Extinguish with a fine water spray or fog - **not** a water jet. Small sulphur fires can be smothered with an application of earth or sand.

### 5.2 Special hazards arising from the substance or mixture

Irritation of the lung and eye may take place with combustion forms of gaseous oxides of sulphur. Dust can explode in certain conditions.

### **5.3 Advice for firefighters**

Self-contained breathing apparatus should be worn, and fire fighters should keep upwind of the blaze.

## **6. ACCIDENTAL RELEASE MEASURES**

### **6.1 Personal precautions, protective equipment and emergency procedures**

*Advice for non-emergency personnel:* Avoid generation of dusts; do not inhale dusts.

Evacuate the danger area, observe emergency procedures, consult an expert.

Personnel should wear full protective clothing: chemical gloves and goggles, anti-static, anti-spark footwear, and regularly laundered overalls. Dust masks and suitable breathing apparatus should also be used if there is a risk of exposure to fumes or combustion products.

*Advice for emergency responders:* see Section 8 for suitable protective clothing and materials.

### **6.2 Environmental precautions**

The relevant authorities must be informed should spillage cause the contamination of vegetation, drains, rivers, streams etc. Any spillage must be swept up, placed in a secure plastic container and taken to a safe place to be disposed of by a licensed contractor under the Waste Disposal Regulations.

### **6.3 Methods and materials for containment and cleaning up**

Remove all sources of ignition, and avoid dust formation. Cover drains. Collect, bund and pump off spills using non-sparking tools and equipment.

Observe possible material restrictions (see Sections 7.2 & 10.5)

## **7. HANDLING AND STORAGE**

### **7.1 Precautions for safe handling**

Wear personal protective clothing and equipment. Ensure adequate ventilation. Do not get in eyes, on skin or on clothing. Avoid ingestion and inhalation. Make sure that eye baths are available wherever accidental exposure may occur so that quick treatment can be given. Avoid dust formation. Keep away from open flames, hot surfaces and sources of ignition. Take measures to avoid build up of electrostatic charge. No smoking in storage and handling areas. Powdered sulphur that is not dust suppressed should be processed in an inert atmosphere, where all equipment can be earthed. Explosion vents of the correct specification should be interlocked with process equipment drives. When open handling, take local exhaust ventilation or dust extraction measures.

### **7.2 Conditions for safe storage including any incompatibilities**

Store in cool, dry, and well ventilated premises away from other flammable materials.

Keep away from open flames, hot surfaces and sources of ignition.

Suitable storage materials: laminated paper or plastic sacks, fibreboard kegs, aluminium.

Unlined steel or any spark generating material are not recommended.

Explosive properties of sulphur dusts:

Ignition temperature of dust cloud: 190 deg. C

Minimum spark energy for ignition of cloud: 15 mJ

Minimum explosive concentration: 35 mg/l

Maximum explosion pressure: 5.5 bar

Average rate of pressure rise: 116 bar/sec

Maximum rate of pressure rise: 325 bar/sec

### 7.3 Specific end uses

Apart from the uses mentioned in section 1.2, no other specific uses are stipulated.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

*Occupational exposure limits:*

Occupation Exposure Limits 8-hour TWA values:

For sulphur dust, total dust 10 mg/cubic metre; respirable dust 4 mg/cubic metre.

For sulphur dioxide, 5.3 mg/cubic metre (2 ppm), [and 10 minute TWA value 13 mg/cubic metre (5 ppm)]

### 8.2 Exposure controls

#### ***Appropriate engineering controls***

It is essential that all users carry out a suitable and sufficient Risk Assessment before handling sulphur.

Personal equipment might include:

Chemical gloves and goggles

Anti-static, anti-spark footwear

Overalls regularly laundered to avoid accumulation of dust particles

Dust masks and suitable breathing apparatus should be used where there is a risk of exposure to fumes or combustion products.

Additives: Operatives should use gloves and/or barrier cream when working with grades containing oil-based additives to avoid irritation of the skin. After use, wash hands thoroughly with soap and water.

For Installation Control, see Section 7. Handling and Storage

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

Risk assessment of protective clothing should take into account Council Directive 89/686/EEC and refer to appropriate CEN standards.

*Eye/face protection* - Safety glasses with side-shields

*Hand protection* –

Full contact:

Glove material: Nitrile rubber

Glove thickness: 0.11mm

Break through time: > 480 min

Splash contact:

Glove material: Nitrile rubber

Glove thickness: 0.11mm

Break through time: > 480 min

*Other protective equipment:*

Protective clothing

*Respiratory protection:*

Required when dusts are generated.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- (a) Appearance - Solid, light yellow. Form: yellow solid lumps, prills, powder or small flakes
- (b) Odour - weak characteristic sulphurous odour
- (c) Odour threshold – no information available

- (d) pH - Not applicable - Sulphur is not soluble in water
- (e) Melting point - 110.2 - 112.8°C (rhombic form). 114.5 - 119.3°C (monoclinic form)
- (f) Boiling Point: 444 °C
- (g) Flash Point: 188°C (Liquid, Cleveland Open Cup Test).
- (h) Evaporation Rate: Not applicable: Sulphur is a solid
- (i) Flammability: Sulphur is a Category 2 flammable solid. Auto flammability 232°C in air at atmospheric pressure (liquid). 235°C (powder, similar conditions)
- (j) Upper/lower flammability: 235°C- 232°C
- (k) Vapour Pressure: 0.042 mbar at 120°C, 0.260 mbar at 150°C
- (l) Vapour density: 2.07g/cc @ 300K
- (m) Relative density: 1.96-2.07 g/cm<sup>3</sup> at 20°C
- (n) Solubility: Practically insoluble
- (o) Partition coefficient n-octanol/water: not applicable, insoluble in both media.
- (p) Auto-ignition temperature: 190°C Ignition temperature of dust cloud
- (q) Decomposition temperature: > 250°C
- (r) Viscosity: 17 mPa.s at 120°C liquid
- (s) Explosive properties: see Section 10: Stability & reactivity
- (t) Oxidising properties: see Section 10: Stability & reactivity

## 9.2 Other information

**Ignition temperature** 235°C Dust  
**Bulk density** ca. 400-500kg/m<sup>3</sup>

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

Risk of dust explosion. Sulphur can contain hydrogen sulphide, an extremely hazardous, toxic compound which can achieve explosive concentrations if released in unventilated rooms.

### 10.2 Chemical Stability

Elemental sulphur will not decompose over time so long as it is stored in a correct manner. For conditions to avoid, see Section 7, Handling and Storage.

Air - Sulphur burns in the air to form sulphur dioxide and other oxides. Only in exceptional circumstances such as atomisation does rapid combustion take place in air at normal handling temperatures

Water - There is generally no dangerous reaction to water

Acids - There is generally no dangerous reaction to acids

Bases/alkalis - There is generally no dangerous reaction to bases and alkalis

### 10.3 Possibility of hazardous reactions

Oxidising agents - When mixed with oxidising materials like chlorates, perchlorates, permanganates and nitrates, sulphur forms a highly sensitive and explosive substance.

Other chemicals: Other substances that may initiate a dangerous reaction are: halogens, carbides, halogenates; many metals but especially alkali metals and alkaline earths; charcoal, phosphorus, fluorides, and nitrides; sulphur dichloride; halogenates.

### 10.4 Conditions to Avoid

Avoid dust formation. Keep away from open flames, hot surfaces and sources of ignition. Take measures to avoid build up of electrostatic charge. No smoking in storage and handling areas.

Powdered sulphur that is not dust suppressed should be processed in an inert atmosphere, where all equipment can be earthed. Explosion vents of the correct specification should be interlocked with process equipment drives. When open handling, take local exhaust ventilation or dust extraction measures.

### 10.5 Incompatible materials

Copper and mild steel. See also Section 10.3

## 10.6 Hazardous decomposition products

Gaseous oxides of Sulphur, Hydrogen Sulphide gas, sulphur dust. See Section 5 for further information on hazardous combustion products and recommendations in the event of fire.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute Toxicity

Acute oral toxicity

LD50 > 5000 mg/kg

Species rat

Source IUCLID

#### Acute Dermal Toxicity

LD50 >2000 mg/kg

Species rabbit

Source IUCLID

#### Acute Inhalation Toxicity

LC50 9.23 mg/L

Duration of exposure 4 hours

Species rat

Source IUCLID

#### *Information on likely routes of exposure*

Skin - causes skin irritation

Eyes - slight irritation. Eye contact may cause mechanical irritation through dust particles

Inhalation of dusts- May irritate the respiratory tract.

Sensitisation- non-sensitising.

#### *Effects after repeated or prolonged exposure (subacute, subchronic, chronic)*

Genotoxicity: *in vitro* Ames Test- Salmonella typhimurium. Result negative

#### *Specific target organ toxicity – single exposure*

The substance is not classified as a specific target organ toxicant, single exposure.

#### *Specific target organ toxicity – repeated exposure*

The substance is not classified as a specific target organ toxicant, repeated exposure.

#### *Aspiration hazard*

No aspiration toxicity classification

### 11.2 Other Information

*Ingestion:* If swallowed Sulphur is poorly absorbed. There are no known systemic effects from ingestion of dust or vapour below 175 mg/kg (rabbit)

*On the Eyes:* Several hours after exposure to dust or vapour, irritation and lachrymation may occur. [Blurred vision, conjunctivitis and photophobia may follow contact with hydrogen sulphide, a potential by product of sulphur]

*On Skin:* No effects have been documented following sulphur on the skin. There are no known systemic effects following the skin absorption of dust or vapour

*Inhalation:* No acute effects have been documented following inhalation of sulphur dust. Dust and vapour may cause irritation of the mucus membranes in cases of chronic exposure.

Chronic exposure to hydrogen sulphide may give headaches, cause bronchitis or rhinitis. The acute effect of the inhalation of hydrogen sulphide is headache, excitement, diarrhoea, staggering, even death.

Handle in accordance with good industrial hygiene and safety practice.

## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

#### *Toxicity to Fish*

LC50 Brachydanio rerio (zebra fish) 866 mg/L Duration of exposure 96 hours (source IUCLID)  
LC50 Oncorhynchus mykiss (rainbow trout) >180mg/L Duration of exposure 96 hours.

#### *Toxicity to Daphnia & other aquatic invertebrates*

EC50 *Daphnia magna* (water flea) >10,000 mg/L Exposure time 24 hours.

#### *Toxicity to Bacteria*

EC50 Activated sludge 1,900mg/L Exposure time 3hours. Method ISO 8192

### 12.2 Persistence and Degradability

Sulphur is a natural component in water and soil.

### 12.3 Bioaccumulative potential

Sulphur has low potential for bioaccumulation.

### 12.4 Mobility in soil

Sulphur has slight mobility in soil.

### 12.5 Results of PBT and vPvB assessment

Sulphur does not meet the PBT criteria (persistent/bioaccumulative/toxic) and vPvB criteria: self classification, as chemical safety assessment not required or previously conducted.

### 12.6 Other adverse effects

No ecological problems are expected, when the product is handled and used with due care and attention.

## 13. DISPOSAL CONSIDERATIONS

All forms of sulphur, or other materials contaminated with sulphur must be disposed of in accordance with Waste Disposal Regulations, using a licensed waste contractor. In the case of spillage, full protective clothing must be worn as detailed in Section 8. Refer also to the accidental release measures in Section 6

### 13.1 Waste treatment methods

#### *Product*





Allocation of a waste code number, according to the European Waste Catalogue should be carried out in agreement with the regional waste disposal company. For further information please see link to the following UK website:  
<http://www.environment-agency.gov.uk/business/topics/waste/31873.aspx>

#### *Packaging*

Residual product must be removed from packaging and when emptied, completely disposed of in accordance with the regulations for waste removal. Incompletely emptied packaging must be disposed of in a form specified by the regional waste disposal company.

## 14. TRANSPORT INFORMATION

### Sulphur in powder form

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 UN number	UN1350	UN1350	UN1350	UN1350
14.2 UN proper shipping name	SULPHUR	SULPHUR	SULPHUR	Sulphur No Limit
14.3 Transport hazard class(es)	4.1 	4.1 	4.1 	4.1 
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	No.	No.	No.	No.
14.6 Special precautions for user	Not available.	Not available.	Not available.	Not available.
Additional information	<u>Hazard identification number</u> 40  <u>Limited quantity</u> LQ9  <u>Special provisions</u> 242  <u>Tunnel code</u> (E)	-	<u>Emergency schedules (EmS)</u> F-A, S-G	<u>Passenger and Cargo Aircraft</u> Quantity limitation: 25 kg Packaging instructions: 419 <u>Cargo Aircraft Only</u> Quantity limitation: 100 kg Packaging instructions: 420 <u>Limited Quantities - Passenger Aircraft</u> Quantity limitation: 10 kg Packaging instructions: Y419

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

### Formed Sulphur (prills, pastilles, granules, microgranules, flakes, sticks, rolls)

#### ADR/RID

Non-restricted

#### IMDG

Non-restricted

#### IATA

Classed as hazardous for air transport. Follow the IATA regulations above for a 4.1 Flammable Solid.



## 15. REGULATORY INFORMATION

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture EU Regulation (EC) No. 1907/2006 (REACH)

*Annex XIV - List of substances subject to authorization Substances of very high concern*  
None of the components are listed.

*Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles* Not applicable.

#### *Other EU regulations*

Europe inventory: All components are listed or exempted

Black List Chemicals: Not listed

Priority List Chemicals: Not listed

Integrated pollution prevention and control list (IPPC) – Air: Not listed

Integrated pollution prevention and control list (IPPC) – Water: Not listed

#### *International regulations*

Chemical Weapons Convention List Schedule I Chemicals: Not listed

Chemical Weapons Convention List Schedule II Chemicals: Not listed

Chemical Weapons Convention List Schedule III Chemicals: Not listed

### 15.2 Chemical Safety Assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

## 16. OTHER INFORMATION



Indicates information that has changed from previously issued version.

#### *Abbreviations and acronyms:*

CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]

#### **Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**

Classification	: Flam. Sol. 2, H228	Expert judgment
Justification	: Skin Irrit. 2, H315	Calculation method
Full text of abbreviated H Statements	: H228 H315	Flammable solid. Causes skin irritation.
Full text of classifications [CLP/GHS]	: Flam. Sol. 2, H228 Skin Irrit. 2, H315	FLAMMABLE SOLIDS - Category 2 SKIN CORROSION/IRRITATION - Category 2
Full text of abbreviated R phrases	: R38 - Irritating to skin.	
Full text of classifications [DSD/DPD]	: Xi - Irritant	
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Date of previous issue	: No previous validation.	
Version	: 1	

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