

# MOLTEN SULPHUR

## UNIVERSAL Chemical Trading GmbH

Chemwatch Hazard Alert Code: 2

Chemwatch: 2448

Version No: 3.1

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

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### SECTION 1 Identification of the substance / mixture and of the company / undertaking

#### Product Identifier

Product name	MOLTEN SULPHUR
Chemical Name	sulfur, molten
Synonyms	S; Elemental sulphur; liquid molten sulfur; solid sulfur
Proper shipping name	SULPHUR, MOLTEN
Chemical formula	S
Other means of identification	Not Available
CAS number	7704-34-9

#### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Manufacture of sulfur based chemicals. Use may require material be molten. Molten or heated material may be compounded, moulded or extruded.
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#### Details of the manufacturer or supplier of the safety data sheet

Registered company name	UNIVERSAL Chemical Trading GmbH
Address	Waldweg 4 Dollern 21739, Germany
Telephone	+49-1521-859-2917
Fax	+49-1521-859-2917
Website	<a href="https://uctr-gmbh.de">https://uctr-gmbh.de</a>
Email	<a href="mailto:info@uctr-gmbh.de">info@uctr-gmbh.de</a>

#### Emergency telephone number

Association / Organisation	UNIVERSAL Chemical Trading GmbH
Emergency telephone numbers	+49-1521-859-2917
Other emergency telephone numbers	Not Available

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

**HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

Poisons Schedule	Not Applicable
Classification <sup>[1]</sup>	Flammable Liquids Category 3, Flammable Solids Category 2, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Hazardous to the Aquatic Environment Acute Hazard Category 1
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

#### Label elements

Hazard pictogram(s)	
Signal word	Warning

#### Hazard statement(s)

H226	Flammable liquid and vapour.
H228	Flammable solid.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

H400	Very toxic to aquatic life.
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**Supplementary statement(s)**

Not Applicable

**Precautionary statement(s) Prevention**

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271	Use only outdoors or in a well-ventilated area.

**Precautionary statement(s) Response**

P370+P378	In case of fire: Use alcohol resistant foam or fine spray/water fog to extinguish.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**Precautionary statement(s) Storage**

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

**Precautionary statement(s) Disposal**

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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**SECTION 3 Composition / information on ingredients****Substances**

CAS No	%[weight]	Name
7704-34-9.	100	<u>sulfur</u>
Not Available		tanks on opening may emit gas as
7783-06-4		<u>hydrogen sulfide</u>

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; \* EU IOELVs available

**Mixtures**

See section above for composition of Substances

**SECTION 4 First aid measures****Description of first aid measures**

<b>Eye Contact</b>	<p>or treat for thermal burn</p> <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▸ Wash out immediately with fresh running water.</li> <li>▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▸ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▸ Immediately remove all contaminated clothing, including footwear.</li> <li>▸ Flush skin and hair with running water (and soap if available).</li> <li>▸ Seek medical attention in event of irritation.</li> </ul> <p>In case of burns:</p> <ul style="list-style-type: none"> <li>▸ Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth.</li> <li>▸ <b>DO NOT remove or cut away clothing over burnt areas. DO NOT pull away clothing which has adhered to the skin as this can cause further injury.</b></li> <li>▸ <b>DO NOT break blister or remove solidified material.</b></li> <li>▸ Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain.</li> <li>▸ For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth.</li> <li>▸ <b>DO NOT apply ointments, oils, butter, etc. to a burn under any circumstances.</b></li> <li>▸ Water may be given in small quantities if the person is conscious.</li> <li>▸ Alcohol is not to be given under any circumstances.</li> <li>▸ Reassure.</li> <li>▸ Treat for shock by keeping the person warm and in a lying position.</li> <li>▸ Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▸ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▸ Lay patient down. Keep warm and rested.</li> <li>▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▸ Transport to hospital, or doctor, without delay.</li> </ul>
<b>Ingestion</b>	<p>or treat as for a thermal burn</p> <ul style="list-style-type: none"> <li>▸ Immediately give a glass of water.</li> <li>▸ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>

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

Treat symptomatically.

## SECTION 5 Firefighting measures

### Extinguishing media

If fire is in tank, container, replacing lid may smother fire.

- Incipient fires in sulfur storage piles can be frequently smothered by gently shoveling more sulfur, sand, or fine earth on them to exclude all air.
- For larger fires, water applied as a fine mist is the most useful agent.

For **SMALL FIRES**:

Dry chemical, CO<sub>2</sub>, water spray or foam.

For **LARGE FIRES**:

Water-spray, fog or foam.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	▸ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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### Advice for firefighters

<b>Fire Fighting</b>	<p>For fires involving sulfur:</p> <ul style="list-style-type: none"> <li>▸ Do not use solid streams of water; which could create sulfur dust clouds and cause an explosion or move burning sulfur to adjacent areas.</li> <li>▸ Fire will rekindle until mass is cooled below 145 C.</li> <li>▸ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▸ Wear breathing apparatus plus protective gloves.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▸ Combustible.</li> <li>▸ Slight fire hazard when exposed to heat or flame.</li> </ul> <p>Combustion products include: carbon dioxide (CO<sub>2</sub>) sulfur oxides (SO<sub>x</sub>) sulfur dioxide (SO<sub>2</sub>) other pyrolysis products typical of burning organic material.</p> <p><b>NOTE:</b> Burns with intense heat. Produces melting, flowing, burning liquid and dense acrid black smoke.</p> <ul style="list-style-type: none"> <li>▸ Sulfur fires are deep blue at night, with very short flames. Fire is invisible by daylight except for smoke and heat.</li> </ul> <p><b>CARE:</b> Contamination of heated / molten liquid with water may cause violent steam explosion, with scattering of hot contents.</p>
<b>HAZCHEM</b>	1Y

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▸ Remove all ignition sources.</li> <li>▸ <b>DO NOT touch or walk through spilled material.</b></li> </ul>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>▸ Sulfur dusts form an explosive mixture with air which may be ignited by static electricity.</li> <li>▸ Explosion may be avoided by preventing atmospheres becoming dust-laden by adequate ventilation or by hose-down instead of sweeping. <b>DO NOT touch the spill material</b></li> <li>▸ Clear area of personnel and move upwind.</li> <li>▸ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 Handling and storage

### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▸ Molten sulfur should be maintained at temperatures between 115 deg. minimum, to prevent accumulation of solid sulfur, and 145 deg. <b>DO NOT allow clothing wet with material to stay in contact with skin</b></li> <li>▸ Avoid all personal contact, including inhalation.</li> <li>▸ Wear protective clothing when risk of overexposure occurs.</li> </ul>
<b>Other information</b>	<p><b>FOR MINOR QUANTITIES:</b></p> <ul style="list-style-type: none"> <li>▸ Store in an indoor fireproof cabinet or in a room of noncombustible construction.</li> <li>▸ Provide adequate portable fire-extinguishers in or near the storage area.</li> </ul>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▸ Glass container is suitable for laboratory quantities</li> </ul> <p>For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.</p>
<b>Storage incompatibility</b>	<p>Sulfur:</p> <ul style="list-style-type: none"> <li>▸ is both an oxidising agent and a reducing agent</li> <li>▸ when finely divided and dry, forms explosive mixtures with air</li> <li>▸ when molten can generate hydrogen sulfide and carbon disulfide when in contact with some organic materials.</li> <li>▸ is a flammable substance in both the solid and liquid states; the dust is characterised by a very low ignition point of 190 C compared to other combustible dusts - dust clouds are readily ignited by weak frictional sparks if the oxygen content is above 8%.</li> </ul> <p>Hydrogen sulfide (H<sub>2</sub>S):</p> <ul style="list-style-type: none"> <li>▸ is a highly flammable and reactive gas</li> <li>▸ reacts violently with strong oxidisers, metal oxides, metal dusts and powders, bromine pentafluoride, chlorine trifluoride, chromium trioxide,</li> </ul>

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- chromyl chloride, dichlorine oxide, nitrogen trichloride, nitril hypofluorite, oxygen difluoride, perchloryl fluoride, phospham, phosphorus persulfide, silver fulminate, soda-lime, sodium peroxide
- ▶ is incompatible with acetaldehyde, chlorine monoxide, chromic acid, chromic anhydride, copper, nitric acid, phenyldiazonium chloride, sodium
  - ▶ forms explosive material with benzenediazonium salts
  - ▶ attacks many metals
- Flow or agitation of hydrogen sulfide may generate electrostatic charges due to low conductivity
- ▶ Sulfides are incompatible with acids, diazo and azo compounds, halocarbons, isocyanates, aldehydes, alkali metals, nitrides, hydrides, and other strong reducing agents.
  - ▶ Many reactions of sulfides with these materials generate heat and in many cases hydrogen gas.
  - ▶ Avoid reaction with oxidising agents

## SECTION 8 Exposure controls / personal protection

## Control parameters

## Occupational Exposure Limits (OEL)

## INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
German Exposure Standards	hydrogen sulfide	Hydrogen sulphide	10 ppm / 14 mg/m <sup>3</sup>	21 mg/m <sup>3</sup> / 15 ppm	Not Available	Not Available

## Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
hydrogen sulfide	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
sulfur	Not Available	Not Available
hydrogen sulfide	100 ppm	Not Available

## Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
sulfur	E	≤ 0.01 mg/m <sup>3</sup>

**Notes:** Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

## MATERIAL DATA

Odour Threshold Value for hydrogen sulfide: 0.0011 ppm (detection), 0.0045 ppm (recognition)

NOTE: Detector tubes for hydrogen sulfide, measuring in excess of 0.5 ppm are available commercially.


The TLV-TWA is protective against sudden death, eye irritation, neuroathenic symptoms such as fatigue, headache, dizziness, and irritability, or permanent central nervous system effects that may result from acute, subchronic, or acute exposure to hydrogen sulfide.

No exposure limits set by NOHSC or ACGIH

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

## Exposure controls

<b>Appropriate engineering controls</b>	<p>Only open containers in a sheltered but well ventilated area, preferably outdoors.</p> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. For large scale or continuous use:</p> <ul style="list-style-type: none"> <li>▶ Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation</li> <li>▶ systems Provide dust collectors with explosion vents</li> </ul>
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <ul style="list-style-type: none"> <li>▶ When handling hot materials wear heat resistant, elbow length gloves.</li> <li>▶ Rubber gloves are not recommended when handling hot objects, materials</li> <li>▶ Protective gloves eg. Leather gloves or gloves with Leather facing</li> <li>▶ Wear physical protective gloves, e.g. leather.</li> <li>▶ Wear safety footwear.</li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>▶ When handling hot or molten liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.</li> <li>▶ Usually handled as molten liquid which requires worker thermal protection and increases hazard of vapour exposure.</li> <li>▶ <b>CAUTION: Vapours may be irritating.</b></li> </ul>

- ▶ Overalls.
- ▶ Eyewash unit.
- ▶ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- ▶ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).

### Respiratory protection

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
  - ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
  - ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- For concentrations exceeding 10 ppm hydrogen sulfide or for unknown concentrations:
- ▶ Respirators should be equipped with pressure demand regulators and operated in pressure demand mode only. If airline units are used, a 5-minute egress bottle must also be carried.
  - ▶ Gas masks or other air-purifying respirators must never be used for H<sub>2</sub>S, due to the poor warning properties of the gas.
  - ▶ When exposure concentrations are unknown and respiratory protection is not used, personal H<sub>2</sub>S warning devices should be worn.
  - ▶ These devices should not be relied on to warn of life-threatening concentrations.
  - ▶ H<sub>2</sub>S rapidly fatigues the sense of smell; the rotten egg odour disappears quickly even where high concentrations are present.

## SECTION 9 Physical and chemical properties

### Information on basic physical and chemical properties

<b>Appearance</b>	Red brown HOT liquid at a temperature above 140 C.. Material is a molten solid, and any contact causes severe burns. <b>CARE:</b> Contamination of heated / molten liquid with water may cause violent steam explosion, with scattering of hot contents.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	2.07
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	232
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition temperature (°C)</b>	Not Available
<b>Melting point / freezing point (°C)</b>	114	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	444-445	<b>Molecular weight (g/mol)</b>	32.06
<b>Flash point (°C)</b>	205	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Slow	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	2.003	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	0.035	<b>Volatile Component (%vol)</b>	Nil @ 38 C.
<b>Vapour pressure (kPa)</b>	0.0146	<b>Gas group</b>	Not Available
<b>Solubility in water</b>	Immiscible	<b>pH as a solution (Not Available%)</b>	Not Applicable
<b>Vapour density (Air = 1)</b>	3.64	<b>VOC g/L</b>	Not Available

## SECTION 10 Stability and reactivity

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> </ul>
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

## SECTION 11 Toxicological information

### Information on toxicological effects

<b>Inhaled</b>	<p>Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage.</p> <p>Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>There is no evidence that systemic poisoning results from inhalation of sulfur dust.</p> <p>Sulfur vapour irritates both the upper and lower respiratory passages and if inhaled may cause coughing, conjunctivitis, nausea, vomiting and chest tightness, bronchitis and in extreme pulmonary oedema (sudden or delayed).</p> <p>Symptoms of hydrogen sulfide (H<sub>2</sub>S) exposure may include profuse salivation, nausea, vomiting, diarrhoea, giddiness, headache, vertigo,</p>
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	<p>amnesia, palpitations, arrhythmia, weakness, muscle cramps, confusion, sudden collapse, unconsciousness and death due to respiratory paralysis (above 300 ppm). Inhalation of (H<sub>2</sub>S) at low concentrations causes headache, dizziness and upset stomach.</p>
Ingestion	<p>Ingested sulfur is converted to sulfides in the gastrointestinal tract, and ingestion of 10 to 20 grams has caused irritation of the GI tract and renal injury. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur. The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.</p>
Skin Contact	<p>Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.</p> <p>Exposure to H<sub>2</sub>S may produce pain, blurred vision, and irritation. These symptoms are temporary in all but severe cases.</p>
Chronic	<p>Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.</p> <p>Sensitive persons can experience skin irritation from repeated exposure to the sulfur dust. Allergic responses can occur.</p> <p>Chronic low level exposures to hydrogen sulfide may produce headache, fatigue, dizziness, irritability and loss of libido. These symptoms may also result from damage produced by isolated or repeated unmeasured peak high level exposures in healthy persons or those suffering from pre-existing neurological diseases.</p>

MOLTEN SULPHUR	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
Inhalation(Rat) LC50; >5.43 mg/L4h <sup>[1]</sup>	Skin: adverse effect observed (irritating) <sup>[1]</sup>	
Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>	
sulfur	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye (human): 8 ppm irritant
Inhalation(Rat) LC50; >5.43 mg/L4h <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>	
Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	Skin: adverse effect observed (irritating) <sup>[1]</sup>	
		Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
hydrogen sulfide	TOXICITY	IRRITATION
	Inhalation(Mouse) LC50; 316.028 ppm4h <sup>[2]</sup>	Not Available
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>MOLTEN SULPHUR</b>	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound.
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Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 Ecological information

## Toxicity

MOLTEN SULPHUR	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	504h	Crustacea	>100mg/l	2
LC50	96h	Fish	>207mg/L	4	
sulfur	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	504h	Crustacea	>100mg/l	2

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	LC50	96h	Fish	>207mg/L	4
hydrogen sulfide	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	3960h	Fish	<0.001mg/L	5
	EC50	48h	Crustacea	0.12mg/l	2
	LC50	96h	Fish	075>0.4mg/l	Not Available
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

Very toxic to aquatic organisms.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

For hydrogen sulfide:

**Environmental fate:**

Since hydrogen sulfide exists as a gas at atmospheric pressure, partitioning to the air is likely to occur after environmental releases. However, the compound is also soluble in oil and water, and therefore, may partition as well to surface water, groundwater, or moist soil.

Sulfide ion is very toxic to aquatic life, threshold concentration for fresh or saltwater fish is 0.5ppm. The product therefore is very toxic to aquatic life.

**DO NOT discharge into sewer or waterways.**

#### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
sulfur	LOW	LOW
hydrogen sulfide	LOW	LOW

#### Bioaccumulative potential

Ingredient	Bioaccumulation
sulfur	LOW (LogKOW = 0.229)
hydrogen sulfide	LOW (LogKOW = 0.229)

#### Mobility in soil

Ingredient	Mobility
sulfur	LOW (KOC = 14.3)
hydrogen sulfide	LOW (KOC = 14.3)



### SECTION 13 Disposal considerations

#### Waste treatment methods

Product / Packaging disposal	<p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.</p> <ul style="list-style-type: none"> <li>▸ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▸ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▸ Recycle wherever possible.</li> <li>▸ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</li> </ul>
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### SECTION 14 Transport information

#### Labels Required

	
Marine Pollutant	
HAZCHEM	1Y

#### Land transport (ADG)

UN number	2448
UN proper shipping name	SULPHUR, MOLTEN
Transport hazard class(es)	Class   4.1
	Subrisk   Not Applicable

<b>Packing group</b>	III	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Limited quantity	0

**Air transport (ICAO-IATA / DGR)**

<b>UN number</b>	2448	
<b>UN proper shipping name</b>	Sulphur, molten	
<b>Transport hazard class(es)</b>	ICAO/IATA Class	4.1
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	3L
<b>Packing group</b>	Not Applicable	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Cargo Only Packing Instructions	Forbidden
	Cargo Only Maximum Qty / Pack	Forbidden
	Passenger and Cargo Packing Instructions	Forbidden
	Passenger and Cargo Maximum Qty / Pack	Forbidden
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

**Sea transport (IMDG-Code / GGVSee)**

<b>UN number</b>	2448	
<b>UN proper shipping name</b>	SULPHUR, MOLTEN	
<b>Transport hazard class(es)</b>	IMDG Class	4.1
	IMDG Subrisk	Not Applicable
<b>Packing group</b>	III	
<b>Environmental hazard</b>	Marine Pollutant	
<b>Special precautions for user</b>	EMS Number	F-A, S-H
	Special provisions	Not Applicable
	Limited Quantities	0

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code**

Product name	Group
sulfur	Not Available
hydrogen sulfide	Not Available

**Transport in bulk in accordance with the ICG Code**

Product name	Ship Type
sulfur	Not Available
hydrogen sulfide	Not Available

**SECTION 15 Regulatory information****Safety, health and environmental regulations / legislation specific for the substance or mixture****sulfur is found on the following regulatory lists**

German Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
 German Inventory of Industrial Chemicals (GIIC)

International WHO List of Proposed Occupational Exposure Limit (OEL) Values  
 for Manufactured Nanomaterials (MNMS)

**hydrogen sulfide is found on the following regulatory lists**

German Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
 German Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)  
 - Schedule 7

German Inventory of Industrial Chemicals (GIIC)

**National Inventory Status**

National Inventory	Status
German - GIIC / German	Yes



National Inventory	Status
Non-Industrial Use	
Canada - DSL	Yes
Canada - NDSL	No (sulfur; hydrogen sulfide)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (sulfur)
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
<b>Legend:</b>	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

## SECTION 16 Other information

<b>Revision Date</b>	20/06/2022
<b>Initial Date</b>	16/08/2006

### SDS Version Summary

Version	Date of Update	Sections Updated
3.1	20/06/2022	Expiration. Review and Update

### Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

### Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average  
 PC—STEL: Permissible Concentration-Short Term Exposure Limit  
 IARC: International Agency for Research on Cancer  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 STEL: Short Term Exposure Limit  
 TEEL: Temporary Emergency Exposure Limit,  
 IDLH: Immediately Dangerous to Life or Health Concentrations  
 ES: Exposure Standard  
 OSF: Odour Safety Factor  
 NOAEL :No Observed Adverse Effect Level  
 LOAEL: Lowest Observed Adverse Effect Level  
 TLV: Threshold Limit Value  
 LOD: Limit Of Detection  
 OTV: Odour Threshold Value  
 BCF: BioConcentration Factors  
 BEI: Biological Exposure Index  
 GIIC: German Inventory of Industrial Chemicals  
 DSL: Domestic Substances List  
 NDSL: Non-Domestic Substances List  
 IECSC: Inventory of Existing Chemical Substance in China  
 EINECS: European Inventory of Existing Commercial chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 NLP: No-Longer Polymers  
 ENCS: Existing and New Chemical Substances Inventory  
 KECI: Korea Existing Chemicals Inventory  
 NZIoC: New Zealand Inventory of Chemicals  
 PICCS: Philippine Inventory of Chemicals and Chemical Substances  
 TSCA: Toxic Substances Control Act  
 TCSI: Taiwan Chemical Substance Inventory  
 INSQ: Inventario Nacional de Sustancias Químicas  
 NCI: National Chemical Inventory  
 FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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