

## SAFETY DATA SHEET

**Product:** SULFUR

N° SDS: Pb0021\_e

Revision: 0.2e

Date: 07/31/2025

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### SECTION 1: IDENTIFICATION

GHS product identifier:	SULFUR
Recommended use of the chemical and restrictions on use:	Use in the production of sulfuric acid; dissolution of wood in the production of cellulose; sugar bleaching; vulcanization of rubber; formulation of insecticides and fungicides; raw material for the chemical industry; feed supplement for livestock.
Supplier's details:	Petrobras Biocombustível S. A. <b>Address:</b> Rua do Passeio, 38, Setor 4, 2º andar, Centro, CEP: 20021-290 - RJ – Brasil. <b>Phone number:</b> 0800-728-9001
Emergency phone number:	0800 728 9001 Opção 02

### SECTION 2: HAZARD IDENTIFICATION

Classification of the substance or mixture:	Flammable Solids - Category 2; Skin Corrosion/Irritation - Category 2.
Classification system adopted:	Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations.

#### GHS label elements, including precautionary statements

Pictograms:



Signal word:	WARNING
Hazard statement(s):	H228 Flammable solid. H315 Causes skin irritation.
Precautionary statement(s):	<b>PREVENTION:</b> P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof electrical, ventilating and lighting equipment. P264 Wash hands thoroughly after handling. P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection.  <b>RESPONSE TO EMERGENCY:</b> P302 + P352 IF ON SKIN: Wash with plenty of water. P321 Specific treatment. P332 + P317 If skin irritation occurs: Get medical help. P362 + P364 Take off contaminated clothing and wash it before reuse. P370 + P378 In case of fire: Use dry sand, carbon dioxide (CO <sub>2</sub> ), water mist and powder to extinguish.
Other hazards which do not result in classification:	Dusts can form explosive mixtures with air.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

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### SUBSTANCE

Chemical identity of the substance:	Sulfur.
Common name(s), synonym(s) of the substance:	Precipitated sulfur; elemental sulfur; sulfur meal.
CAS number:	7704-34-9
EC number:	231-722-6
Molecular formula:	S
Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance:	Does not contain components that contribute to the hazard.

### SECTION 4: FIRST-AID MEASURES

#### Description of necessary first-aid measures

Inhalation:	Remove the victim to a well-ventilated area and keep them at rest in a position that is comfortable for breathing. Monitor respiratory function. If the victim is having difficulty breathing, provide oxygen. If necessary, administer artificial respiration. If you feel unwell, contact a POISON CENTER or a doctor. Bring this document with you.
Skin:	Wash exposed skin with sufficient water for at least 15 minutes to remove the product. Remove and isolate contaminated clothing and shoes. If skin irritation occurs: Consult a doctor. Bring this document.
Eye:	Rinse thoroughly with water for at least 15 minutes. If you wear contact lenses, remove them if easy to do so and continue rinsing. If eye irritation persists, consult a doctor. Bring this document.
Ingestion:	Rinse the victim's mouth with plenty of water. Never give anything orally to an unconscious person. If you feel unwell, contact a Poison Control Center or a doctor. Bring this document with you.
Most important symptoms/effects, acute and delayed:	Causes skin irritation with redness and pain.
Indication of immediate medical attention and special treatment needed, if necessary:	Avoid contact with the product when assisting the victim. If necessary, symptomatic treatment should include, above all, supportive measures such as correction of hydroelectrolytic and metabolic disorders, as well as respiratory assistance. In case of skin contact, do not rub the affected area.

### SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media:	Suitable: dry sand, carbon dioxide (CO <sub>2</sub> ), water mist and powder. Unsuitable: water directly onto the burning material.
Specific hazards arising from the chemical:	Combustion of the product or its packaging can form irritating and toxic gases such as carbon monoxide and dioxide and sulfur oxide and dioxide. Very dangerous when exposed to excessive heat or other ignition sources such as sparks, open flames, match and cigarette flames, welding operations, pilot lights, and electric motors. May build up static charge due to flow or agitation. Vapors from heated product can ignite due to static discharge. Vapors are denser than air and tend to accumulate in low or confined areas, such as

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Special protective actions for fire-fighters:	manholes and basements. They can travel great distances, causing flashback or new fires in both open and confined spaces. Containers may explode if heated. If the cargo is engulfed in fire, isolate and evacuate the area within a minimum radius of 800 meters. Wear self-contained breathing apparatus (SCBA) with positive pressure and full protective clothing. Containers and tanks involved in the fire should be cooled with water mist.
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### SECTION 6: ACCIDENTAL RELEASE MEASURES

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

For non-emergency personnel:	Isolate the leak from ignition sources. Keep unauthorized personnel away from the area. Stop the leak if it can be done without risk. Prevent sparks or flames. Do not smoke. Do not touch damaged containers or spilled product without wearing appropriate clothing. Avoid exposure to the product. Stay in a safe place, with the wind at your back. Use personal protective equipment as described in section 8.
For emergency responders:	Wear full PPE including safety glasses, PVC safety gloves, long-sleeved coveralls, and closed-toe shoes. In the event of a spill, where exposure is high, a suitable respiratory protection mask with a fume or mist filter is recommended.
Environmental precautions:	Prevent spilled product from reaching waterways and sewage systems.
Methods and materials for containment and cleaning up:	Use water mist to reduce vapor dispersion. Collect the product with a clean shovel or other instrument that won't disperse the product. Place the product in appropriate containers and remove them to a safe location. Use non-sparking tools to collect the product. All equipment used for handling must be electrically grounded. For final disposal, proceed as per Section 13 of this document.

### SECTION 7: HANDLING AND STORAGE

#### Precautions for safe handling

Precautions for safe handling:	Handle in a well-ventilated area or with general ventilation/local exhaust ventilation. Avoid dust formation. Avoid inhalation and contact with skin, eyes, and clothing. Use personal protective equipment as described in section 8. Avoid contact with incompatible materials.
General hygiene:	Wash your hands and face thoroughly after handling food and before eating, drinking, smoking, or using the restroom. Contaminated clothing should be changed and washed before reuse. Remove contaminated clothing and protective equipment before entering eating areas.

#### Conditions for safe storage, including any incompatibilities

Technical measures for prevention of fire and explosion:	Keep away from heat, sparks, open flames, and hot surfaces. Do not smoke. Keep the container tightly closed. Ground the container and the product receiver during transfers. Use only non-sparking tools. Avoid the buildup of electrostatic charges. Use explosion-proof electrical, ventilation, and lighting equipment.
Conditions for safe storage, including any incompatibilities:	Store in a cool, dry, well-ventilated place, away from sunlight, heat, and ignition sources. Keep the container closed. The storage location should have a waterproof floor, be free of combustible materials, and have a containment dam to prevent leakage. Store at room temperature and under atmospheric pressure. It is not necessary addition of stabilizers and antioxidants to ensure the durability. This material may react dangerously with some incompatible materials as outlined in Section 10. Keep away from incompatible materials.
Packaging compatibilities:	Similar to the original packaging.
Inadequate packaging materials:	There are not known unsuitable material.

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**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION****Control parameters**

Occupational exposure limit: No occupational exposure limits are established.

Biological limit: No biological indicators of exposure are established.

Other limits and values: No other limits and values are established.

Appropriate engineering controls: A risk assessment is recommended to define the engineering control measures necessary to eliminate or minimize the risk. These measures help to reduce exposure to the product.

**Individual protection measures, such as personal protective equipment (PPE)**

Eye/face protection: Safety glasses with side shields.

Skin protection: Jumpsuit with long sleeves and safety shoes. PVC protective gloves.

Respiratory protection: In case of potential high exposure to dust from the product, use respiratory protection. This may be used in combination with a supplied-air respirator, full facepiece operated in positive pressure mode.

Thermal hazards: It does not present thermal hazards.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Physical state: Solid, crystalline.

Colour: Yellowish.

Odour: Not available.

Melting point/freezing point: 120 °C (248 °F).

Boiling point or initial boiling point and boiling range: 444.6 °C (832.28 °F).

Flammability: Flammable.

Lower and upper explosion limit/flammability limit: Upper: 1400 g/m<sup>3</sup> and Lower: 35 g/m<sup>3</sup>.

Flash point: 160 °C (320 °F) - Closed cup.

Auto-ignition temperature: 232 °C (449.6 °F).

Decomposition temperature: Not available.

pH: Not available.

Kinematic viscosity: Not available.

Solubility: Insoluble in water. Slightly soluble in ethanol, benzene, ethyl ether.

Partition coefficient n-octanol/water (log value): log  $K_{ow}$ : 0.23 (calculated).

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Vapour pressure: 3.95 x10<sup>-6</sup> at 30.4 °C (86.72 °F).

Density and/or relative density: Absolute density: 2.1 g/cm<sup>3</sup>.  
Relative vapour density: 7.837 (Air = 1).

Particle characteristics: Not available.

Other information: Dynamic viscosity: 0.17 Pa.s at 120 °C (248 °F).

### SECTION 10: STABILITY AND REACTIVITY

Reactivity: Reactivity is not to be expected under normal conditions of temperature and pressure.

Chemical stability: Product stable under normal temperature and pressure conditions.

Possibility of hazardous reactions: May react violently with aluminum, ammonia, boron, calcium, zinc carbides, phosphorus, halogens, indium, lithium, nickel, ammonium nitrate, palladium, ammonium perchlorate, potassium, sodium, and uranium, posing an explosion hazard. Reacts violently with strong oxidants, posing an explosion and fire hazard, especially in powder form.

Conditions to avoid: High temperatures. Ignition sources. Contact with incompatible materials. Dust formation and accumulation.

Incompatible materials: Aluminum, ammonia, ammonium nitrate, Ammonium perchlorate, boron, calcium, halogen, halogen compounds, indium, lithium, nickel, oxidizing agents, palladium, phosphorus, potassium, sodium, uranium and zinc carbides.

Hazardous decomposition products: No hazardous decomposition products are known.

### SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity: Product not classified as acute toxic.  
LC<sub>50</sub> Dusts and mists (rats, 4h): 5.43 mg/L.  
LD<sub>50</sub> Oral (rats): >2000 mg/kg.  
LD<sub>50</sub> Dermal (rats): > 2000 mg/kg.

Skin corrosion/irritation: Causes skin irritation with redness and pain.

Serious eye damage/irritation: It is not expected to cause eye irritation.

Respiratory or skin sensitization: It is not expected to present respiratory or skin sensitization.

Germ cell mutagenicity: It is not expected to show mutagenicity in germ cells.

Carcinogenicity: It is not expected to be carcinogenic.

Reproductive toxicity: It is not expected to be reproductively toxic.

STOT - Single exposure: It is not expected to exhibit specific target organ toxicity by single exposure.

STOT - Repeated exposure: It is not expected to exhibit specific target organ toxicity on repeated exposure.

Aspiration hazard: It is not expected to present an aspiration hazard.

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**SECTION 12: ECOLOGICAL INFORMATION**

Ecotoxicity:	It is not expected to be ecotoxic.
Persistence and degradability:	Due to the lack of data, it is expected to be persistent and not rapidly degraded.
Bioaccumulative potential:	Presents low bioaccumulative potential in aquatic organisms. log $K_{ow}$ : 0.23 (calculated).
Mobility in soil:	Not determined.
Other adverse effects:	No other environmental effects known.

**SECTION 13: DISPOSAL CONSIDERATIONS****Disposal methods**

Must be disposed of as waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product.

Keep the product remains in its original and properly closed containers. Disposal should be performed as established for the product.

**SECTION 14: TRANSPORT INFORMATION**

<b>Road:</b>	UN - United Nations: Model Regulations: <ul style="list-style-type: none"><li>• Recommendations on the Transport of Dangerous Goods.</li></ul>
UN number:	1350
UN proper shipping name:	SULPHUR
Transport hazard class(es):	4.1
Packing group:	III
Environmental hazards:	The product is not considered dangerous for the environment for land transport.
<b>Railway regulations:</b>	COTIF - Convention concerning International Carriage by Rail: <ul style="list-style-type: none"><li>• Appendix C: RID - Regulations concerning the International Carriage of Dangerous Goods by Rail.</li></ul>
UN number:	1350
UN proper shipping name:	SULPHUR
Transport hazard class(es):	4.1
Packing group:	III
Environmental hazards:	The product is not considered dangerous for the environment in rail transport.
<b>Sea:</b>	IMO - International Maritime Organization: <ul style="list-style-type: none"><li>• IMDG Code - International Maritime Dangerous Goods Code.</li></ul>
UN number:	1350
UN proper shipping name:	SULPHUR

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Transport hazard class(es):	4.1		
Packing group:	III		
Environmental hazards:	It's not considered a marine pollutant for transportation.		
EmS:	F-A,S-G		
<b>Air:</b>	IATA - International Air Transport Association: • DGR - Dangerous Goods Regulation.		
UN number:	1350		
UN proper shipping name:	SULPHUR		
Transport hazard class(es):	4.1		
Packing group:	III		
Environmental hazards:	The product is not considered dangerous for the environment for air transport.		
Special precautions for user:	Not applicable.		
Transport in bulk according to IMO instruments:	Consult regulations: <ul style="list-style-type: none"> <li>• International Maritime Organization: MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006;</li> <li>• International Maritime Organization: IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.</li> </ul>		

### SECTION 15: REGULATORY INFORMATION

#### Safety, health and environmental regulations specific for the product in question

Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.

### SECTION 16: OTHER INFORMATION

This document was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other products, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

#### Change control:

Version	Manufacture date	Changes
0.2e	07/31/2025	Change in section: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16.

#### Abbreviations:

ACGIH - American Conference of Governmental Industrial Hygienists;

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CAS - Chemical Abstracts Service;  
EC - European Community;  
EEC - European Economic Community;  
EPA - United States Environmental Protection Agency;  
IARC - International Agency for Research on Cancer;  
 $K_{ow}$  - Octanol-water partition coefficient;  
LC<sub>50</sub> - Lethal Concentration 50%;  
LD<sub>50</sub> - Lethal Dose 50%;  
NIOSH - National Institute for Occupational Safety and Health;  
OSHA - Occupational Safety & Health Administration;  
PBT - Persistent, bioaccumulative and toxic;  
UN - United Nations;  
vPvB - Very Persistent and very Bioaccumulative.

### **Bibliographic references:**

ACGIH - AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Cincinnati-USA, 2025.

CONCAWE - HAZARD CLASSIFICATION AND LABELLING OF PETROLEUM SUBSTANCES IN THE EUROPEAN ECONOMIC AREA. Available in: <<https://www.concawe.eu/>>. Access at: Jun. 2025.

ECHA - EUROPEAN CHEMICAL AGENCY. Available in: <<http://echa.europa.eu/web/guest>>. Access at: Jun. 2025.

EPA - UNITED STATES ENVIRONMENTAL PROTECTION AGENCY. Available in: <<https://www.epa.gov/>>. Access at: Jun. 2025.

GESTIS - SUBSTANCE DATABASE. Available in: <<https://gestis-database.dguv.de/>>. Access at: Jun. 2025.

GHS - GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS. 10th rev. ed. New York and Geneva: United Nations, 2023.

HSDB - HAZARDOUS SUBSTANCES DATA BANK. Available in: <<http://pubchem.ncbi.nlm.nih.gov/>>. Access at: Jun. 2025.

IARC - INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available in: <<http://monographs.iarc.fr/ENG/Classification/index.php>>. Access at: Jun. 2025.

NIOSH - NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available in: <<http://www.cdc.gov/niosh/>>. Access at: Jun. 2025.

OSHA - OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION. UNITED STATES DEPARTMENT OF LABOUR. <<https://www.osha.gov/chemicaldata/search>>. Access at: Jun. 2025.

REACH - REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICALS. Commission Regulation (EC) No 1272/2008 of December 2008 amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals. Available in: <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:en:PDF>>. Access at: Jun. 2025.