GPS Safety Summary
Sulfur Trioxide

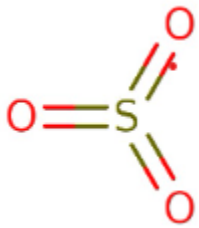
Reference number: AIL-GPS-075 Issue date: 14/04/2025 Version: 1.0 **CL-4: PUBLIC**

1. General Statement

Sulfur Trioxide is liquid or solid, depending on the composition.alpha and beta forms are solid, gamma form is liquid. Commercially available mixture is solid.Sulphur trioxide exists in three modifications: alpha, beta and gamma form.Molten SO3 exists only in the gamma-form. Condenses when cooled down forming solid, ice-like gamma-SO3, slowly converting to beta-SO3 and alpha-SO3 when stored for a long time.Commercially available as a mixture of solid beta and alpha SO3 or as a fuming liquid (oleum).Non-combustible.Combustible substances may ignite on contact with sulphur trioxide.Converts explosively with water to sulphuric acid.Hygroscopic.Highly volatile.Acute or chronic health hazards result from the substance.

2. Chemical identification.

Name :Sulfur Trioxide
CAS number(s) :7446-11-9
EC number :274-516-1
Molecular formula :O3S
Structure :



3. Uses and Benefits

It is used in an Intermediate in sulfuric acid manufacture; in sulfonations for formation of addition compounds with amines; in the manufacture of explosives.It is also used Industrial use as Explosive: additiveLubricating oil: component Detergent: component

4. Physical / chemical properties

Property	Value
Physical state :	Liquid
Colour :	Colourless
Odour :	Odourless
pH :	NDA
Melting point :	17 °C
Boiling point :	45 °C

Flash point :	Not quantifiable
Density :	1920 kg/m3 (20 °C)
Solubility in Water:	Reacts with water. Water: hydrolyzes

5. Health Effects

Effect Assessment	Result
Acute toxicity (Oral / inhalation / dermal)	NA
Irritation / corrosion Skin / eye/ respiratory tract	Causes severe skin burns and eye damage.,ay cause respiratory irritation
Respiratory or skin sensitisation	NA
Toxicity after repeated exposure Oral / inhalation / dermal	NA
Genotoxicity / Mutagenicity	NA
Carcinogenicity	NA
Toxicity for reproduction	NA

6. Environmental Effects

Effect Assessment	Result
Aquatic toxicity	Yes
Fate and behavior	**Result**
Persistence and degradability	Biodegradability: not applicable.
Bioaccumulative potential	No information available

7. Exposure

Human health

This substance causes severe skin burns and eye damage, causes serious eye damage and may cause respiratory irritation.The exposure must be kept as minimum as possible by the use of appropriate risk management measures suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.Careless handling or accidental spillage of the chemical could result in exposure to potentially hazardous levels of chemicals.Industrial workers should ensure that they follow the advice found in the extended safety data sheet (SDS).

Environment

Care should be taken to avoid releases of these products to sewage, drainage systems and water bodies. Spillage shall be quickly collected in the event of an accidental release. More information about release measures and accidental release measures are available in the extended safety data sheet.

8. Risk Management Recommendations

Human health measures

Organizational	A basic standard of occupational hygiene is recommended. Ensure operatives are well informed of the hazards and trained to minimise exposures. Ensure regular inspection and maintenance of equipment and machines. Handle and store according to the indications of the Safety Data Sheet.	
Protection	Eye protection:	Protective goggles (EN 166)
	Skin and body protection:	Head/neck protection. Corrosion-proof clothing (EN 14605)
	Respiratory protection:	Protective gloves against chemicals (EN 374)
Engineering controls	Ensure good ventilation of the work station.	
Environment protective measures		
Avoid release to the environment		

9. First-aid measures

First-aid measures after inhalation: Remove victims into fresh air. In case of respiratory problems, consult a doctor/medical service.

First-aid measures after skin contact: If possible, wipe up/dry remove chemicals. Then rinse/shower immediately for 30 minutes with (lukewarm) water. Cut clothing; never remove burnt clothing from the wound. Do not give any pain medication. Consult a doctor/medical service..

First-aid measures after eye contact: Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Consult a doctor/medical service.

First-aid measures after ingestion : Rinse mouth with water. Immediately consult a doctor/medical service. Do not wait for symptoms to occur to consult the Poison Center.

10. Fire-fighting measures

Extinguishing media
Suitable extinguishing media: Adapt extinguishing media to the environment for surrounding fires.
Unsuitable extinguishing media : No information available.

Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: On burning: release of toxic and corrosive gases/vapours (sulphur dioxide).

Advice for firefighters
Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions: Cool tanks/drums with water spray/remove them into safety. Cool from behind cover/unmanned monitors. When cooling/extinguishing: no water in the substance. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion. Dilute toxic gases with water spray. Take account of toxic/corrosive precipitation water. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.

11. Accidental release measures

Protective equipment :Gas-tight suit (EN 943). Corrosion-proof suit (EN 14605).
Environmental precautions: Prevent soil and water pollution. Prevent spreading in sewers.

For containment : Contain released product, collect/pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Dilute toxic gases/vapours with water spray. Take account of toxic/corrosive precipitation water.

12. Disposal consideration

Regional legislation (waste) : Disposal must be done according to official regulations.

Waste treatment methods : Dispose of contents/container in accordance with licensed collector’s sorting instructions.

Sewage disposal recommendations : Disposal must be done according to official regulations.

13. Handling and storage

Precautions for safe handling: Keep away from naked flames/heat. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Clean Contaminated clothing. Keep the container tightly closed. Use corrosion proof equipment. Handle Uncleaned empty containers as full ones. Thoroughly clean/dry the installation before use.Avoid contact of substance with water. Do not discharge the waste into the drain..

Hygiene measures : Observe very strict hygiene - avoid contact.

14. Classification and Labeling

Hazard pictograms (CLP)	:	 GHS05 GHS07
Signal word (CLP)	:	Danger
Hazard statements (CLP)	:	H314 - Causes severe skin burns and eye damage. H335 - May cause respiratory irritation.
Precautionary statements (CLP)	:	P260 - Do not breathe dust, gas, fume, mist, spray, vapours. P264 - Wash hands, forearms and face thoroughly after handling. P271 - Use only outdoors or in a well-ventilated area. P280 - Wear protective clothing, eye protection, face protection, protective gloves. P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 - Immediately call a POISON CENTER, a doctor. P312 - Call a POISON CENTER, doctor if you feel unwell. P321 - Specific treatment (see supplemental first aid instruction on this label). P403+P233 - Store in a well-ventilated place. Keep container tightly closed. P405 - Store locked up. P501 - Dispose of contents, container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

15. Conclusion

Sulfur Trioxide is liquid or solid, depending on the composition.alpha and beta forms are solid, gamma form is liquid. Commercially available mixture is solid.Sulphur trioxide exists in three modifications: alpha, beta and gamma form.Molten SO3 exists only in the gamma-form. Condenses when cooled down forming solid, ice-like gamma-SO3, slowly converting to beta-SO3 and alpha-SO3 when stored for a long time.Commercially available as a mixture of solid beta and alpha SO3 or as a fuming liquid (oleum).Non-combustible.Combustible substances may ignite on contact with sulphur trioxide.Converts explosively with water to sulphuric acid.Hygroscopic.Highly volatile.Acute or chronic health hazards result from the substance.(Polymeric) alpha-SO3 decomposes above 50 deg C forming(trimeric) gamma-SO3.Heating of alpha-SO3 to its melting point results in sudden increase in vapor pressure, which can be forceful enough to shatter a glass vessel in which it is heated.This effect is known as the "alpha explosion".The reaction with water, forming sulfuric acid, occurs vigorously to explosively with strong evolution of heat.Risk of explosion in contact with:water chlorates, difluorine dioxide; formamide + iodine + pyridine (modified Karl-Fischer reagent); perchloric acid (rarely); tetrachloroethylene.The substance can react dangerously with:combustible substances ,organic substances,sulfuric acid,acetonitrile + sulfuric acid; barium oxide; lead,oxide;dimethyl sulfoxide; dioxane; diphenyl mercury; various metals (moisture); metal oxides; nitryl chloride; white phosphorus.Care should be taken to avoid releases of these products to sewage, drainage systems and water bodies.The exposure must be kept as minimum as possible by the use of appropriate risk management measures as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.

16. Contact Information within company

Manufacturer
Aarti Industries Limited
Udyog Kshetra, 2nd Floor, Mulund Goregaon Link Road, Mulund (West)
400080 Mumbai - India
T +91-22-6797-6666 - F +91-22-2565 3234
info@aarti-industries.com - www.aarti-industries.com

This GPS safety summary is intended to give general information about the health, safety and environment and not intended to provide in-depth details. To obtain the most accurate and current information, consult the appropriate Safety Data Sheet (SDS) prior to use of the material named herein.