SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier	:	Sulphur Gundih
Other means of identification	:	Granular Sulphur
Recommended use of the chemical and restrictions on use	:	This product is used as Vicose Staple Fibre (VSF)
Manufacturer	:	PT Pertamina (Persero) Jl. Medan Merdeka Timur No. 1A Jakarta Pusat ZIP Code 10110 Phone: 1500-000 Email: pcc@pertamina.com
Emergency phone number	:	1500-000

2. HAZARD IDENTIFICATION

Classification :
Flammable solid, category 1
Combustible solid, category 2
Self-reactive substances and mixtures, tipe C
Acute toxoiity (oral), category 4
Skin irritation, category 2
Serious eye irritation, category 2
Acute toxicity (inhalation), category 4
Specific target organ toxicity, single exposure, category 3

Signal word : Warning

Hazard statement :
Physical Hazard
H228 – Flammable solid
H242 – Hetaing may cause fire
Health Hazard
H302 – Harmful if swallowed
H315 - Causes skin irritation.
H319 – Causes serious eye irritation
H332 – Harmful if inhaled
H335 – May cause respiratory irritation

Precautionary statement :
Prevention
P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 – Keep container tightly closed.
P234 – Keep only in original packaging.
P235 – Keep cool.
P240 - Ground/Bond container and receiving equipment.
P241 – Use explosion-proof (electrical/ventilating/lighting) equipment.
P261– Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 – Wash hand thoroughly after handling.
P270 – Do not eat, drink, or smoke when using this product.
P271 – Use only outdoors or in well-ventilated area.
P273 – Avoid release to the environment.

2. HAZARD IDENTIFICATION

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

Response

P321 – Specific treatment (see section 4)

P330 – Rinse mouth.

P301 + P312 – IF SWALOWWED: Call a POISON CENTER/doctor if you feel unwell.

P302 + P352 – IF ON SKIN: Wash with plenty of water.

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.

P332 + P313 – IF skin irritation occurs: Get medical advice/attention.

P337 + P313 – If eye irritation persists: Get medical advice/attention.

P362 + P364 – Take off contaminated clothing and wash it before reuse.

P370 + P378 – In case of fire: Use carbon dioxide, foam, water fog, dry chemical to extinguish.

Storage

P405 – Store locked up.

P403 + P233 – Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 – Dispose of contents/container to appropriate area.

Pictogram :

Other hazards which do not result in classification : No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration (%)
Sulphur	7704-34-9	Min. 99.8

4. FIRST AID MEASURES

Necessary description

- **In case of eye contact** : Rinse immediately with plenty of Water for 15 minutes. If irritation persists, seek medical advice.
- **In case of skin contact** : Wash the contacted part with water and soap. If melted Sulphur contact to skin, do the cooling as soon as possible with amount of water. Call a doctor to remove Sulphur that is attached, then do treatment for burns.

4. FIRST AID MEASURES

- **If inhaled** : Keep away victim from source of exposure. If respiratory irritation occurs, feel dizzy, nausea, victim is unconscious, seek immediate medical attention. If victim is not breathing, give cardiopulmonary resuscitation with bag-valve-mouth device.
- **If swallowed** : Slightly occurs.

Most important symptoms/effects : No data available.

Indication of Immediate medical attention and special treatment needed, if necessary : No data available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide, foam, water fog, dry chemical

Unsuitable extinguishing media : No data available.

Specific hazards

- **Other explosion and fire hazards** : Possible contains H2S (flammable gas, and toxic)

Flash point °C : 45^{o} C

Flammability value : 370^{o}F or 188^{o}C (closed cup)

Hazardous chemical composition : No data available.

Special protective actions for fire fighters

a. Carbon dioxide (CO_2) : Spray it to the base of fire from upwind.

b. Dry chemical powder : Spray it to the base of fire from upwind.

c. Foam : When the fire is in a container, spray the foam into the inner wall of the container from upwind.

d. Water fog : Spray it to the base of fire from upwind, keep container cool. Prevent the dilution in order not to release to the river, drain or source of drink water.

Special protective equipment for fire-fighter : For fires in relatively closed areas, the fire fighters must be equipped with Self Contained Breathing Apparatus (SCBA).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures : Keep away from heat / spark / open fire / hot surfaces. - No Smoking. Avoid inhale mist / vapor / spray from the product. Use the appropriate personal protective equipment.

Environmental precautions : Prevent spill in order not to pollute drain, soil and sand.

Procedures : Notify relevant authorities in accordance with all applicable regulations (eg. BAPEDAL).

Methods and materials for : Avoid source of fire. Clean up and dispose to waste facility.

6. ACCIDENTAL RELEASE MEASURES

containment and cleaning up The officer must wear personal protective equipment.

7. HANDLING AND STORAGE

Precautions for safe handling : Avoid breathing vapours. Use Sulphur in a well-ventilated area. Keep away from flames and hot surfaces. Avoid contact to Sulphur.

Conditions for safe storage (including any incompatibilities) : There is possibility to form H_2S which is hazardous to respiratory tract and explosive. The container have to well-ventilated to avoid H_2S accumulated. Store facility is equipped with ventilation and the concentration of H_2S was measured before enter to the facility.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

- **Exposure limit** : TWA 10 ppm atau 14 mg/m^3
  STEL 15 ppm atau 21 mg/m^3
- **Biological exposure indicator** : No data available

Appropriate engineering control

- **Ventilation** : Use in room or facility with local exhaust ventilation to keep the low concentration.

Individual protection measures

- **Eye and face protection** : Use safety glasses with side shields.
- **Skin protection** : Use appropriate gloves.
- **Respiratory protection** : Specific treatment does not need in a normal condition. If the concentration is high, use respirator or dust masker.
  Is a possible that H2S will accumulate on headspace of tank or container. Wear respiratory with positive pressure to open that tank or container.
- **Hygiene practices** : Wash hands at rest and after work.
  Do not eat and drink while using the product.
  No smoking while using the product.

9. CHEMICAL AND PHYSICIAL PROPERTIES

Characteristic		Test Result
Organoleptic (physical appearance, color, etc)	:	Solid at ambient temperature, yellow
Odor	:	No odor
Odor threshold	:	No data available
pH	:	No data available
Melting/freezing point	:	112.8 - 120°C at 101.3 kPa*

9. CHEMICAL AND PHYSICIAL PROPERTIES

Characteristic		Test Result
Boiling point/boiling range	:	444.6 °C at 101.3 – 101.325 kPa*
Flammability	:	Flammable solid
Flash point	:	370°F atau 188°C
Evaporation rate	:	No data available
Lower/upper flammability limit and explosion limit	:	No data available
Vapor pressure	:	0 - 0.001 Pa at 20 - 40 °C*
Vapor density	:	No data available
Relative density	:	0.002 – 2.07 g/cm^3 pada 20 °C*
Solubility		
• **Water solubility**	:	Insoluble
• **Other solubility**	:	Insoluble
Partition coefficient (n-octanol/water)	:	No data available
Auto-ignition temperature	:	225°C at 101.325 kPa*
Decomposition temperature	:	No data available
Viscosity	:	No data available

* Data refers to ECHA Europe

10. STABILITY AND REACTIVITY

Reactivity	:	Polymerization of hazardous materials is not formed.
Chemical stability	:	The product is stable at normal temperature and pressure.
Posibility of hazardous reactions	:	No hazardous reactions under normal conditions.
Conditions to avoid	:	Heat, high temperature, source of ignition
Incompatible materials	:	Oxidizer, base, metal, HCl, fluorine.
Hazardous decomposition products	:	H_2S, Sulphur oxide

11. TOXICOLOGICAL INFORMATION

Comprehensive toxicological/health information

• **Acute toxicity**	:	Oral: No adverse effect observed LD50 2.000 - 12.448 mg / kg (rat). Inhalation: There was No adverse effect observed LC50 5430 mg / m3 (rat). Dermal: No adverse impact of LD50 2.000 mg / kg (rat
• **Skin corrosion/ irritation**	:	Expected to cause skin irritation.
• **Serious eye damage/irritation**	:	Suspected to cause serious eye irritation.
• **Respiratory or skin**	:	No data available. Suspected that it may not cause

11. TOXICOLOGICAL INFORMATION

sensitization		respiratory or skin sensitization according to compound or product which has similar structure or composition.
• **Germ cell mutagenicity**	:	No data available. Suspected that it is not mutagen according to compound or product which has similar structure or composition.
• **Carcinogenicity**	:	No data available. Suspected that it may not cause cancer according to compound or product which has similar structure or composition.
• **Reproductive toxicity**	:	No data available. Suspected that it may not toxic to reproductive organs according to compound or product which has similar structure or composition.
• **STOT-single exposure**	:	Suspected to cause respiratory tract irritation .
• **STOT-repeated exposure**	:	Oral: No adverse effects on NOAEL 1000 mg / kg bw / day (subchronic, mice). Dermal: No adverse effects on NOAEL 1000 mg / kg bw / day (subacute, mouse).
• **Aspiration hazards**	:	No data available. Suspected that it is not aspiration hazards according to compound or product which has similar structure or composition.
Information on the likely routes exposure	:	Ingested and skin contact.
Symptoms related to the physical, chemical, and toxicological characteristics	:	No data available. Further testing has not been done.
Delayed and immediate effects, and also chronic effects from both short or long term exposure	:	No data available. Further testing has not been done.
Numerical measure of toxicity	:	No data available. Further testing has not been done.
Interative effects	:	No data available. Further testing has not been done.
Where specific chemical data are not available	:	No data available. Further testing has not been done.
Mixture	:	No data available. Further testing has not been done.
Mixture vs. Ingredient information	:	No data available. Further testing has not been done.
Other in formation	:	No data available. Further testing has not been done.

12. ECOLOGICAL INFORMATION

Ecotoxicity	:	Sulphur is not classified as an environmental hazard. In six studies on ecological effect (involving bobwhite quail, two fish species, daphnia, mysid shrimp and honey bees),

12. ECOLOGICAL INFORMATION

Sulphur has been shown to be practically non-toxic to the species tested.
Short-term toxicity to fish:
LL50 (4 days) 5 g/L
Long-term toxicity to fish:
NOEC (28 days) 9,3 mg/L
LOEC (28 daysi) 42,4 mg/L

Persistence and degradability	:	Sulphur is amenable to microbial utilization. Therefore, this material can be degraded by microorganisms and is regarded as inherently biodegradable.
Bioaccumulative potential	:	No data available. Further testing has not been done.
Mobility in soil	:	No data available. Further testing has not been done.
Other adverse effects	:	No data available. Further testing has not been done.

13. DISPOSAL CONSIDERATION

Disposal methods	:	Recycling at waste facility.

14. TRANSPORT INFORMATION

USA DOT

UN Number	:	UN 1350
UN proper shipping name	:	Sulphur, solid
Transport hazard class(es)	:	ORM-C
Packing group (if available)	:	No data avalaible
Environmental hazard	:	-
Special precautions for user (UN Model Regulation)	:	-

RID / ADR

UN Number	:	-
UN proper shipping name	:	-
Transport hazard class(es)	:	-
Packing group (if available)	:	-
Environmental hazard	:	-
Special precautions for user	:	-

IMO

UN Number	:	UN 1350
UN proper shipping name	:	Sulphur, powder
Transport hazard class(es)	:	4.1
Packing group (if available)	:	Hazardous soilid
Environmental hazard	:	-
Special precautions for user	:	-

ICAO / IATA : Forbidden.

15. REGULATORY INFORMATION

Safety, health, and environmental regulation (specific for the product in question) :

- Peraturan Menteri Perindustrian Nomor 23/M-IND/PER/4/2013 tentang Perubahan Atas Peraturan Menteri Perindustrian Nomor 87/M-IND/PER/9/2009 Tentang Sistem Harmonisasi Global Klasifikasi dan Label pada Bahan Kimia
- Peraturan Direktur Jenderal Basis Industri Manufaktur No. 04/BIM/PER/I/2014 tentang Petunjuk Teknis dan Petunjuk Pengawasan Pelaksanaan Sistem Harmonisasi Global Klasifikasi dan Label Pada Bahan Kimia
- Peraturan Pemerintah Republik Indonesia Nomor 74 Tahun 2001 Tentang Pengelolaan Bahan Berbahaya dan Beracun
- Keputusan Menteri Tenaga Kerja No Kep-187/Men/1999 tentang Pengendalian Bahan Kimia Berbahaya
- Peraturan Menteri Kesehatan Republik Indonesia Nomor 70 Tahun 2016 tentang Standar dan Persyaratan Kesehatan Lingkungan Kerja Industri
- ACGIH. 2016. TLVs and BEIs.

16. OTHER INFORMATION

Revision date : 2017

Key/legend or acronym used in the SDS :

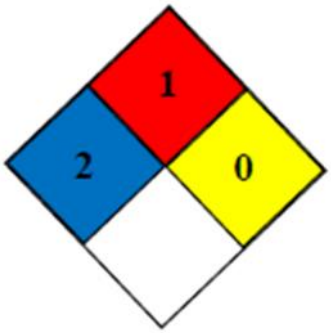
ACGIH - American Conference on Governmental Industrial Hygienist
BEI - Biological Exposure Indices
CAS No. - Chemical Abstract Service Number
IMO - International Maritime Organization
ICAO/IATA - International Civil Organization Aviation/ International Air Transport Association
LOEC - Lowest Observed Effect Concentration
NOAEL - No Observed Adverse Effect Level
NOEC - No Observed Effect Concentration
RID/ADR - European Agreements Concerning the International Carriage of Dangerous Goods by Rail and by road
SCBA - Self Contained Breathing Apparatus
STEL - *Short-Term Exposure Limit*
TWA - Time-Weighted Average
USA DOT - United States Department of Transportation
UN - United Nations

Key literature references and sources for data used in the SDS : echa.europa.eu

Attention : Sulphur residue which is flammable (vapour) and toxic may still contains in an empty container. Do not welding, cutting or close to the Sulphur container.

16. OTHER INFORMATION

NFPA :



Degrees	Red	Blue	Yellow
0	Will not burn	Live ordinary material	Normally stable
1	Must be preheated to burn	Slightly hazardous	Unstable if heated – use normal precautions
2	Ignites when moderately heated	Hazardous – use breathing apparatus	Violent chemical change possible – use hose streams from distance
3	Ignites at normal temperatures	Extremely dangerous – use full protective clothing	Strong shock or heat may detonate - use monitors from behind explosion resistant barriers
4	Extremely flammable	Too dangerous to enter vapor or liquid	May detonate – vacate area if materials are exposed to fire

White	
	Radioactive
W	Never contact with water

Disclaimer

The information is composed based on current knowledge and intended to describe safety, health, and environment hazard of the product. Therefore, it should not be construed as guarantee any specific property of the product. All risks while using this product is the user's responsibility. It is not allowed to make change of this document, except there is legal consent.