SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Spent Solvent Filters

Version	Revision Date:	SDS Number:	Print Date: 04/01/2022
1.0	04/01/2022	VRAM00037	Date of last issue: 04/01/2022

SECTION 1. IDENTIFICATION

Product name : Spent Solvent Filters (Using spent Amine SDS - Included with other SDS sent)

Product code : 002D6252

Manufacturer or supplier's details

Manufacturer/Supplier : **Vertex Refining Alabama LLC**
400 Industrial Pkwy
Ext. East
Saraland, AL 36571

SDS Request : 251-679-7180

Customer Service : 251-679-7180

Emergency telephone number

Spill Information : 1-800-424-9300

Health Information : 1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Waste Chemicals

Restrictions on use :
This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Flammable Liquids : Category 1

Acute toxicity (Oral) : Category 4

Skin irritation : Category 2

Serious eye damage/eye irritation : Category 1

Acute toxicity (Inhalation) : Category 3

Specific target organ toxicity - repeated exposure : Category 2

Acute aquatic toxicity : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :

PHYSICAL HAZARDS:
H224 Extremely flammable liquid and vapour.
HEALTH HAZARDS:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H373 May cause damage to organs () through prolonged or repeated exposure.
ENVIRONMENTAL HAZARDS:
H400 Very toxic to aquatic life.

Precautionary statements :

Prevention:

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.

Response:

P370 + P378 In case of fire: Use appropriate media to extinguish.
P321 Specific treatment (see supplemental first aid instructions on this label).
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P330 Rinse mouth.
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/doctor.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P314 Get medical advice/ attention if you feel unwell.
P391 Collect spillage.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards

Other hazards which do not result in classification

High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.
Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.
Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.
Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
Hydrogen sulphide is highly toxic and may be fatal if inhaled.
Irritating to eyes.
Hydrogen sulphide (H2S), an extremely flammable and toxic gas, and other hazardous vapours may evolve and collect in the headspace of storage tanks, transport vessels and other enclosed containers.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death.
The classification of this material is based on OSHA HCS 2012 criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Contains hydrogen sulphide, CAS # 7783-06-4.

Hazardous components

Chemical name	Synonyms	CAS-No.	Concentration (% w/w)
Hydrogen sulfide	hydrogen sulphide (Gas)	7783-06-4	>= 0.08 - <= 10
2,2'-iminodiethanol	2,2'-iminodiethanol	diethanolamine	>= 23 - <= 27

Water		7732-18-5	>= 65 - <= 70

Hydrogen sulphide may be present both in the liquid and the vapour. Composition is complex and varies with the source of the crude oil and the contributing process plants at that time.

SECTION 4. FIRST-AID MEASURES

General advice : Vapourisation of H2S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from the victim to rescuer. Mechanical ventilation should be used to resuscitate if at all possible.

If inhaled : Casualties suffering ill effects as a result of exposure to hydrogen sulphide should be removed to fresh air.
Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardiopulmonary Resuscitation (CPR) as required and transport to the nearest medical facility.

Call emergency number for your location / facility.
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.

In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Obtain medical attention even in the absence of apparent wounds.

In case of eye contact : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.

If swallowed : Call emergency number for your location / facility.
If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.
If any of the following delayed signs and symptoms appear

within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

Most important symptoms and effects, both acute and delayed : Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Eye irritation signs and symptoms may include a burning sensation and a temporary redness of the eye.
If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever.
The onset of respiratory symptoms may be delayed for several hours after exposure.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, lightheadedness, headache and nausea.
Auditory system effects may include temporary hearing loss and/or ringing in the ears.
Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

Indication of any immediate medical attention and special treatment needed : Treat symptomatically.
The concentration of lead alkyl compounds present is not significant in the context of treating acute poisoning unless the person has been laying in a pool of the product for some time.

Hydrogen sulphide (H2S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out.
Use foam, water fog for major fires.
Use dry chemical powder, carbon dioxide, sand or earth for minor fires.

Unsuitable extinguishing media : Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire.
Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Specific hazards during fire-fighting : Hydrogen sulphide (H2S) and other toxic sulphur oxides may be given off when this material is heated. Do not depend on

sense of smell for warning.

Hazardous combustion products may include:
Carbon monoxide may be evolved if incomplete combustion occurs.
Unidentified organic and inorganic compounds.
Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapor Explosion (BLEVE).
Contents are under pressure and can explode when exposed to heat or flames.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Clear fire area of all non-emergency personnel. Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter. Test atmosphere for flammable gas concentrations to ensure safe working conditions before personnel are allowed to enter the area.
Environmental precautions	:	Use appropriate containment to avoid environmental contamination.
Methods and materials for containment and cleaning up	:	Allow to evaporate. Attempt to disperse the gas or to direct its flow to a safe location, for example by using fog sprays. Avoid contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. Take precautionary measures against static discharges.

Additional advice	:	For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet. Vapour may form an explosive mixture with air. Risk of explosion. Inform the emergency services if product enters surface water drains.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Take precautionary measures against static discharges.
Advice on safe handling	:	Ensure that all local regulations regarding handling and storage facilities are followed. This product is intended for use in closed systems only. This product can create a low temperature exposure hazard when released as a liquid. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Avoid prolonged or repeated contact with skin. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Earth all equipment. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 10 ppm, the area should be evacuated unless respiratory protection is in use.
Avoidance of contact	:	Strong oxidising agents.
Product Transfer	:	Do not use compressed air for filling discharge or handling.

Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Delivery lines may become cold enough to present a cold burns hazard. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge. The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 10 ppm, the area should be evacuated unless respiratory protection is in use.

Further information on storage stability	:	Store only in purpose-designed, appropriately labelled pressure vessels or cylinders. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat. Do not store near cylinders containing compressed oxygen or other strong oxidizers. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
Packaging material	:	Suitable material: For containers and container linings, use materials specifically approved for use with this product., Examples of suitable materials are: PA-11, PEEK, PVDF, PTFE, GRE (Epoxy), GRVE (vinyl ester), Viton (FKM), type F and GB, Neoprene (CR). Unsuitable material: Some forms of cast iron., Examples of materials to avoid are: ABS, polymethyl methacrylate (PMMA), polyethylene (PE / HDPE), polypropylene (PP), PVC, natural rubber (NR), Nitrile (NBR) ethylene propylene rubber (EPDM), Butyl (IIR), Hypalon (CSM), polystyrene, polyvinyl chloride (PVC), polyisobutylene., For containers and container linings, aluminium should not be used if there is a risk of caustic contamination of the product.
Container Advice	:	Do not cut, drill, grind, weld or perform similar operations on or near containers. Containers, even those that have been emptied, can contain explosive vapours.
Specific use(s)	:	Not applicable.

See additional references that provide safe handling practices: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Hydrogen sulfide	7783-06-4	TWA	5 ppm 7 mg/m3	2009/161/EU
	Further information: This value is for information where there is no national limit value available.			
Hydrogen sulfide		STEL	10 ppm 14 mg/m3	2009/161/EU
	Further information: This value is for information where there is no national limit value available.			
Hydrogen sulfide		STEL	5 ppm	ACGIH
	Further information: Central Nervous System impairment, Upper Respiratory Tract irritation			
Hydrogen sulfide		CEIL	20 ppm	OSHA Z-2
Hydrogen sulfide		Peak	50 ppm (10 minutes once only if no other measured exposure occurs)	OSHA Z-2
Hydrogen sulfide		TWA	1 ppm	ACGIH
Hydrogen sulfide		STEL	5 ppm	ACGIH
	diethanolamine	TWA (Inhalable fraction and vapor)	1 mg/m3	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Use sealed systems as far as possible.
Firewater monitors and deluge systems are recommended.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Eye washes and showers for emergency use.

General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Do not ingest. If swallowed then seek immediate medical assistance

Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
All respiratory protection equipment and use must be in accordance with local regulations.

Select a filter suitable for organic gases and vapours [Type A

boiling point >65°C (149°F)].

In areas where hydrogen sulphide vapours may accumulate, a positive-pressure air-supplied respirator is advised.

Hand protection

Remarks	:	Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs. Nitrile rubber gloves. For incidental contact/splash protection Neoprene, PVC gloves may be suitable.
Eye protection	:	If material is handled such that it could be splashed into eyes, protective eyewear is recommended. If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.
Skin and body protection	:	Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.
Protective measures	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Environmental exposure controls

General advice	:	Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	colourless
Odour	:	Mild ammonia to rotten-egg odor
Odour Threshold	:	Data not available
pH	:	Not applicable
Melting point/freezing point	:	Data not available
Initial boiling point and boiling range	:	Data not available
Flash point	:	<= 132.5 °C / 270.5 °F
Evaporation rate	:	Data not available
Upper explosion limit / upper flammability limit	:	Data not available
Lower explosion limit / Lower flammability limit	:	Data not available
Vapour pressure	:	Not applicable
Relative vapour density	:	Data not available
Relative density	:	Data not available
Density	:	Typical 1,050 - 1,070 kg/m3 (15.0 °C / 59.0 °F)
Solubility(ies)		
Water solubility	:	soluble
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Data not available
Auto-ignition temperature	:	Data not available
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, kinematic	:	7.2 - 7.6 mm2/s (50.0 °C / 122.0 °F)
Explosive properties	:	Classification Code: NOT CLASS: Not classified
Conductivity	:	This material is not expected to be a static accumulator.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No, product will not become self-reactive.
Chemical stability	:	Stable under normal conditions of use.
Possibility of hazardous reactions	:	No hazardous reaction is expected when handled and stored according to provisions
Conditions to avoid	:	Heat, open flames, sparks and flammable atmospheres. In certain circumstances product can ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation. Hydrogen sulphide.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Inhalation is the primary route of exposure although exposure may occur through skin or eye contact.

Acute toxicity

Product:

Acute oral toxicity	:	(Rat): Remarks: Harmful if swallowed. LD50 > 300 - <= 2000 mg/kg
Acute inhalation toxicity	:	(Rat): Exposure time: 4 h Remarks: Toxic if inhaled. LC50 > 2.0 - <= 10.0 mg/l Highly toxic and may be fatal if inhaled. (Hydrogen Sulfide)
Acute dermal toxicity	:	Remarks: May be harmful in contact with skin.
Acute toxicity (other routes of administration)	:	Remarks: Hydrogen sulphide (H2S) may cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure.

Skin corrosion/irritation

Product:
Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:
Remarks: Irritating to eyes. (Hydrogen Sulfide), Causes serious eye damage.

Respiratory or skin sensitisation

Germ cell mutagenicity

Carcinogenicity

IARC	Group 2B: Possibly carcinogenic to humans
	2,2'-iminodiethanol diethanolamine
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

STOT - single exposure

Product:
Remarks: Inhalation of vapours or mists cause irritation to the respiratory system. (Hydrogen Sulfide)

STOT - repeated exposure

Product:
Remarks: Causes damage to organs through prolonged or repeated exposure.

Further information

Product:
Remarks: H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (dead-

ens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Information given is based on a knowledge of the components and the ecotoxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity) :
Remarks: Very toxic.
LC/EC/IC50 <= 1 mg/l

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) :
Remarks: Very toxic.
LC/EC/IC50 < 1 mg/l

Toxicity to algae (Acute toxicity) :
Remarks: Very toxic.
LC/EC/IC50 < 1 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: Data not available

Toxicity to microorganisms (Acute toxicity) : Remarks: Very toxic.
LC/EC/IC50 <= 1 mg/l

Persistence and degradability

Product:

Biodegradability : Remarks: Readily biodegradable.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Mobility in soil

Product:

Mobility : Remarks: Large volumes may penetrate soil and could con-

taminate groundwater.
Contains volatile components.

Other adverse effects

Product:

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Do not dispose into the environment, in drains or in water courses
Given the nature and uses of this product, the need for disposal seldom arises. If necessary, dispose by controlled combustion in purpose-designed equipment. If this is not possible, contact the supplier.

Contaminated packaging : Return part-used or empty cylinders to the supplier.
For tanks seek specialist advice from suppliers.
Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
Do not pollute the soil, water or environment with the waste container.

Local legislation

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

UN/ID/NA number	:	UN 3383
Proper shipping name	:	Toxic by inhalation liquid, flammable, n.o.s. (Hydrogen sulphide, Diethanolamine)
Class	:	6.1
Subsidiary risk	:	3
Packing group	:	I
Labels	:	6.1I (3)
ERG Code	:	131

Marine pollutant : no

International Regulations

IATA-DGR

UN/ID No.	:	UN 3383 (Not permitted for transport)
Proper shipping name	:	Toxic by inhalation liquid, flammable, n.o.s. (Hydrogen sulphide, Diethanolamine)
Class	:	6.1
Subsidiary risk	:	3
Packing group	:	Not Assigned
Labels	:	6.1 (3)

IMDG-Code

UN number	:	UN 3383
Proper shipping name	:	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. (Hydrogen sulphide, Diethanolamine)
Class	:	6.1
Subsidiary risk	:	3
Packing group	:	I
Labels	:	6.1 (3)
Marine pollutant	:	no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied. MARPOL Annex 1 rules apply for bulk shipments by sea.

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
2,2'-iminodiethanol	diethanolamine	100	370

*: Vertex HSSE classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore re-leases to the environment are not reportable under CERCLA., The components with RQs are given for information.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Components	CAS-No.	Component TPQ (lbs)
Hydrogen sulfide	7783-06-4	500

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Hydrogen sulfide	7783-06-4	>= 10 - < 20 %

SARA 311/312 Hazards : Skin corrosion or irritation
Acute toxicity (any route of exposure)
Specific target organ toxicity (single or repeated exposure)
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

2,2'-iminodiethanol	diethanolamine	>= 20 - < 30 %
Hydrogen sulfide	7783-06-4	>= 10 - < 20 %

Clean Water Act

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Hydrogen sulfide	7783-06-4	10 %

US State Regulations

Pennsylvania Right To Know

2,2'-iminodiethanol	diethanolamine
Hydrogen sulfide	7783-06-4

California Prop. 65

WARNING: This product can expose you to chemicals including 2,2'-iminodiethanol, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

2,2'-iminodiethanol	diethanolamine
Hydrogen sulfide	7783-06-4

California List of Acutely Hazardous Chemicals, Toxics and Reactives

Hydrogen sulfide	7783-06-4

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity)	3, 4, 0

Full text of other abbreviations

2009/161/EU	:	2009/161/EU
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-2	:	USA. Occupational Exposure Limits (OSHA) - Table Z-2
2009/161/EU / STEL	:	Short term exposure limit

2009/161/EU / TWA	:	Limit Value - eight hours
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
ACGIH / STEL	:	Short-Term Exposure Limit (STEL)
OSHA Z-2 / CEIL	:	Acceptable ceiling concentration
OSHA Z-2 / Peak	:	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
Abbreviations and Acronyms	:	The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty

MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HPV = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Due to a change in detail in Section 15, this document has been released as a significant change.

Revision Date : 04/01/2022

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN