TRISILYLAMINE

Safety Data Sheet SIT8715.8

Issue date: 23/02/2016 Revision date: 21/05/2020 Version: 1.1

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

1.1. Product identifier

Product form	:	Substance
Physical state	:	Liquid
Substance name	:	TRISILYLAMINE
Product code	:	SIT8715.8
Formula	:	H9NSi3
Synonyms	:	DISILAZANE, 2-SILYL- SILANE, NITRILOTRIS- SILANAMINE, N,N-DISILYL-
Chemical family	:	HYDRIDOSILANE

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/mixture : Chemical intermediate

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

GELEST INC.
Fritz-Klatte-Strasse 8
65933 Frankfurt
Germany
T +49 (0) 69 3535106-500 - F +49 (0) 69 3535106-501 - (M-F): 8:00 AM - 4:00 PM
info@gelestde.com - www.gelestde.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids, Category 2	H225
Substances and Mixtures which, in contact with water, emit flammable gases, Category 1	H260
Acute toxicity (inhalation:vapour) Category 2	H330
Skin corrosion/irritation, Category 1B	H314
Serious eye damage/eye irritation, Category 1	H318
Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation	H335

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS02 GHS05 GHS06

Signal word (CLP) : Danger

Hazard statements (CLP) : H225 - Highly flammable liquid and vapour.
H260 - In contact with water releases flammable gases which may ignite spontaneously.
H314 - Causes severe skin burns and eye damage.
H330 - Fatal if inhaled.
H335 - May cause respiratory irritation.

Precautionary statements (CLP) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P223 - Do not allow contact with water.
P231+P232 - Handle under inert gas. Protect from moisture.
P240 - Ground/bond container and receiving equipment.
P310 - Immediately call a POISON CENTER or doctor.

EUH-statements : EUH014 - Reacts violently with water.

2.3. Other hazards

Other hazards not contributing to the classification : This compound reacts with moisture in living tissue to generate ammonia. The US ACGIH (TWA) for ammonia is 25 ppm.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name : TRISILYLAMINE

CAS-No. : 13862-16-3

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trisilylamine	(CAS-No.) 13862-16-3	95 – 100	Flam. Liq. 2, H225 Water-react. 1, H260 Acute Tox. 2 (Inhalation), H330 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Wash with plenty of water/…. Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects : Causes severe skin burns and eye damage.

Symptoms/effects after inhalation : Fatal if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Causes (severe) skin burns.

Symptoms/effects after eye contact : Causes serious eye damage.

Symptoms/effects after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Foam. Carbon dioxide. Dry chemical.

Unsuitable extinguishing media : Water.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Highly flammable liquid and vapour. In contact with water releases flammable gases which may ignite spontaneously. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame. Liquid generates strong static charge when poured.

Explosion hazard : May form flammable/explosive vapour-air mixture.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapours are flammable. Do not allow contact with water. This compound is known to have an exceptional tendency to accumulate static charge. The user must take extreme care to dissipate static charge by grounding of all equipment involved in liquid transfer.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Do not allow contact with water. Ground/bond container and receiving equipment. Handle under inert gas. Protect from moisture. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place. Store locked up. Store in a dry place. Store in a closed container.

Incompatible materials : Acids. alcohols. Metal salts. Oxidizing agent. Peroxides. Platinum (Pt).

Storage area : Store in a cool area. Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls:

Handle in an enclosing hood with exhaust ventilation.

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical goggles or face shield. Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified combination organic vapor - amine gas (brown cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Clear liquid.
Molecular mass	:	107.33 g/mol
Colour	:	No data available
Odour	:	Ammonia.
Odour threshold	:	No data available
Refractive index	:	No additional information available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	> 1
Melting point	:	No data available
Freezing point	:	-106 °C
Boiling point	:	52 °C
Flash point	:	-48 °C
Auto-ignition temperature	:	> 101 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Highly flammable liquid and vapour,In contact with water releases flammable gases which may ignite spontaneously.
Vapour pressure	:	109 mm Hg @ 0˚C
Relative vapour density at 20 °C	:	4.46
Relative density	:	0.895
% Volatiles	:	100 %
Solubility	:	Insoluble in water. Reacts violently with water.
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Partition coefficient n-octanol/water (Log Kow)	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable in sealed containers in a cool place.

10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating ammonia. In the presence of strong alkalis will generate flammable hydrogen gas.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Acids. alcohols. Metal salts. Oxidizing agent. Peroxides. Platinum (Pt).

10.6. Hazardous decomposition products

Ammonia. Hydrogen. Silicon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Fatal if inhaled.

TRISILYLAMINE (13862-16-3)	
ATE CLP (vapours)	0.5 mg/l/4h

Trisilylamine (13862-16-3)	
LC50 inhalation rat (ppm)	439 ppm/1h
ATE CLP (gases)	219.5 ppmv/4h
ATE CLP (vapours)	0.5 mg/l/4h
ATE CLP (dust,mist)	0.05 mg/l/4h

Skin corrosion/irritation : Causes severe skin burns.

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity : Not classified

STOT-single exposure : May cause respiratory irritation.

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

Symptoms/effects after inhalation : Fatal if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Causes (severe) skin burns.

Symptoms/effects after eye contact : Causes serious eye damage.

Symptoms/effects after ingestion : May be harmful if swallowed.

Reason for classification : Expert judgment

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations : Do not dispose of waste into sewer.

Product/Packaging disposal recommendations : May be incinerated. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility..

Additional information : Handle empty containers with care because residual vapours are flammable.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : 3491

UN-No. (IMDG) : 3491

UN-No. (IATA) : 3491

UN-No. (ADN) : 3491

UN-No. (RID) : 3491

14.2. UN proper shipping name

Proper Shipping Name (ADR) : TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S.

Proper Shipping Name (IMDG) : TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S.

Proper Shipping Name (IATA) : Toxic by inhalation liquid, water-reactive, flammable, n.o.s.

Proper Shipping Name (ADN) : TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S.

Proper Shipping Name (RID) : TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S.

Transport document description (ADR) : UN 3491 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. (TRISILYLAMINE), 6.1 (3+4.3), I, (C/D)

Transport document description (IMDG) : UN 3491 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. (TRISILYLAMINE), 6.1 (4.3+3), I

Transport document description (IATA) : UN 3491 Toxic by inhalation liquid, water-reactive, flammable, n.o.s. (TRISILYLAMINE), 6.1

Transport document description (ADN) : UN 3491 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. (TRISILYLAMINE), 6.1 (4.3+3), I

Transport document description (RID) : UN 3491 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. (TRISILYLAMINE), 6.1 (3+4.3), I

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 6.1 (3, 4.3)

Danger labels (ADR) : 6.1, 3, 4.3

:

IMDG

Transport hazard class(es) (IMDG) : 6.1 (4.3, 3)

Danger labels (IMDG) : 6.1, 4.3, 3

:

IATA

Transport hazard class(es) (IATA) : 6.1 (3, 4.3)

ADN

Transport hazard class(es) (ADN) : 6.1 (4.3, 3)

Danger labels (ADN) : 6.1, 4.3, 3

:

RID

Transport hazard class(es) (RID) : 6.1 (3, 4.3)

Danger labels (RID) : 6.1, 3, 4.3

:

14.4. Packing group

Packing group (ADR) : I

Packing group (IMDG) : I

Packing group (IATA) : Not applicable

Packing group (ADN) : I

Packing group (RID) : I

14.5. Environmental hazards

Dangerous for the environment : No

Marine pollutant : No

Other information : IMDG: 6270-5 EmS no. 6.1-107 MFAG Table No. subsection: 4.2, TOXIC INHALATION HAZARD ZONE B AIR TRANSPORT IS FORBIDDEN.

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : TFW

Special provisions (ADR) : 274

Limited quantities (ADR) : 0

Excepted quantities (ADR) : E0

Packing instructions (ADR) : P602

Mixed packing provisions (ADR) : MP8, MP17

Portable tank and bulk container instructions (ADR) : T20

Portable tank and bulk container special provisions (ADR) : TP2

Tank code (ADR) : L10CH

Tank special provisions (ADR) : TU14, TU15, TE19, TE21

Vehicle for tank carriage : FL

Transport category (ADR) : 1

Special provisions for carriage - Loading, unloading and handling (ADR) : CV1, CV13, CV28

Special provisions for carriage - Operation (ADR) : S2, S9, S14

Hazard identification number (Kemler No.) : 623

Orange plates :

Tunnel restriction code (ADR) : C/D

- Transport by sea

Special provisions (IMDG)	:	274
Limited quantities (IMDG)	:	0
Excepted quantities (IMDG)	:	E0
Packing instructions (IMDG)	:	P602
Tank instructions (IMDG)	:	T20
Tank special provisions (IMDG)	:	TP2, TP13
EmS-No. (Fire)	:	F-G
EmS-No. (Spillage)	:	S-N
Stowage category (IMDG)	:	D
Stowage and handling (IMDG)	:	SW2, H1
Segregation (IMDG)	:	SG5, SG7, SG13, SG25, SG26
Properties and observations (IMDG)	:	A variety of toxic liquids which present a highly toxic inhalation hazard as well as being water-reactive and flammable. Highly toxic if swallowed, by skin contact or by inhalation.

- Air transport

PCA Limited quantities (IATA)	:	Forbidden
PCA limited quantity max net quantity (IATA)	:	Forbidden
PCA packing instructions (IATA)	:	Forbidden
PCA max net quantity (IATA)	:	Forbidden
CAO packing instructions (IATA)	:	Forbidden
CAO max net quantity (IATA)	:	Forbidden
ERG code (IATA)	:	6WF

- Inland waterway transport

Classification code (ADN)	:	TFW
Special provisions (ADN)	:	274
Limited quantities (ADN)	:	0
Excepted quantities (ADN)	:	E0
Equipment required (ADN)	:	PP, EP, EX, TOX, A
Ventilation (ADN)	:	VE01, VE02
Number of blue cones/lights (ADN)	:	2

- Rail transport

Classification code (RID)	:	TFW
Special provisions (RID)	:	274
Limited quantities (RID)	:	0
Excepted quantities (RID)	:	E0
Packing instructions (RID)	:	P602
Mixed packing provisions (RID)	:	MP8, MP17
Portable tank and bulk container instructions (RID)	:	T20
Portable tank and bulk container special provisions (RID)	:	TP2
Tank codes for RID tanks (RID)	:	L10CH
Special provisions for RID tanks (RID)	:	TU14, TU15, TU38, TE21, TE22
Transport category (RID)	:	1
Special provisions for carriage - Loading, unloading and handling (RID)	:	CW13, CW28, CW31
Hazard identification number (RID)	:	623

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

TRISILYLAMINE is not on the REACH Candidate List

TRISILYLAMINE is not on the REACH Annex XIV List

TRISILYLAMINE is not subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 july 2012 concerning the export and import of hazardous chemicals.
TRISILYLAMINE is not subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

% Volatiles : 100 %

15.1.2. National regulations

Germany

Regulatory reference : Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV)

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Abbreviations and acronyms:

	Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemcial Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor

Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 2 (Inhalation:vapour)	Acute toxicity (inhalation:vapour) Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
Water-react. 1	Substances and Mixtures which, in contact with water, emit flammable gases, Category 1
H225	Highly flammable liquid and vapour.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
EUH014	Reacts violently with water.

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