SAFETY DATA SHEET

1. Product and company identification

Name of the chemical **TTS-5001-T**

Other means of identification

Sales Code GHFVME

Recommended use of the chemical and restrictions on use

Recommended use Sealants
good adhesion to Glass and Metal Sealants
good adhesion to Glass and Metal ,
Silicone Sealant for construction

Recommended restrictions Industrial use only.

2. Hazards identification

Hazard classification

Physical hazards	Not classified.	
Health hazards	Serious eye damage/eye irritation	Category 2
	Sensitization, skin	Category 1B
Environmental hazards	Not classified.	

*Hazards not stated here are "Not classified", "Not applicable" or "Classification not possible".

Label elements

Symbols

Signal word Warning

Hazard statement Causes serious eye irritation. May cause an allergic skin reaction.

Precautionary statement

Prevention Avoid breathing dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards This product reacts with water , moisture or humid air to evolve following compounds: Methylethylketoxime

Supplemental information None.

3. Composition/information on ingredients

Mixture

Chemical name	CAS Number	Concentration (%)
Methyloximesilane	22984-54-9	1 - 5
Vinyloximesilane	2224-33-1	0.3 - 1
3-(2-Aminoethylamino)propyltrimethoxysilane	1760-24-3	0.3 - 1
Methylethylketoxime(Impurity)	96-29-7	< 1

Decomposition	CAS Number	Concentration (%)
Methylethylketoxime	96-29-7	

4. First aid measures

First aid measures for different exposure routes

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. For minor skin contact, avoid spreading material on unaffected skin. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

Eye contact Rinse immediately with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. Get medical attention immediately.

Most important symptoms and effects Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.

Personal protection for first-aid responders Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

Notes to physician Treat symptomatically.

5. Fire-fighting measures

Extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Extinguishing media to avoid None known.

Specific hazards during fire fighting By heating and fire, harmful vapors/gases may be formed.
Nitrogen oxides. (corrosive)

Special fire fighting procedures Move containers from fire area if you can do so without risk.

Protection of fire-fighters Firefighters must use standard protective equipment including flame retardant coat, helmet, gloves, rubber boots, and self-contained breathing apparatus.

6. Accidental release measures

Personal precautions Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Do not touch or walk through spilled material. Ensure adequate ventilation. Wear appropriate personal protective equipment.

Environmental precautions Prevent further leakage or spillage if safe to do so.

Spill cleanup methods Eliminate sources of ignition.

Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use.

7. Handling and storage

Handling Provide adequate ventilation. Use care in handling/storage. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid contact with skin. Avoid contact with eyes. Do not breathe mist or vapor. Avoid prolonged exposure.

Storage Keep container tightly closed. Keep out of the reach of children. Store in a cool, dry place out of direct sunlight. Store away from incompatible materials (see Section 10 of the SDS).
Keep in original container.

8. Exposure controls/personal protection

Occupational exposure limits

Vendor guide

Components	Type	Value
Methylethylketoxime(Impurity) (CAS 96-29-7)	STEL	10 ppm
	TWA	3 ppm

Decomposition	Type	Value
Methylethylketoxime (CAS 96-29-7)	STEL	10 ppm
	TWA	3 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Provide eyewash station.
Pay attention to ventilation such as local exhaust, mechanical and/or door open for at least 24 hours after application.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Wear protective gloves.

Other Wear suitable protective clothing.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Avoid contact with skin. Avoid contact with eyes. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance

Form Paste.

Color Milk-white, translucent

Odor Oxime odor

Odor threshold Not available.

pH Not measurable(Refer to water solubility)

Melting point/freezing point No data

Boiling point, initial boiling point, and boiling range Not applicable

Flash point > 141.8 °F (> 61 °C) Closed Cup (Does not sustain combustion)

Auto-ignition temperature Not available.

Flammability (solid, gas) Not applicable.

Flammability limit - lower (%) No data

Flammability limit - upper (%) No data

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Negligible (25 °C)

Vapor density > 1 (air=1)

Evaporation rate < 1 (Butyl Acetate=1)

Relative density 1.03 (25 °C)

Density Not available.

Solubility Not soluble

Partition coefficient (n-octanol/water) Not applicable

Decomposition temperature Not available.

Viscosity Not applicable

Molecular weight	Not applicable

10. Stability and reactivity

Reactivity	No hazardous reaction known under normal conditions of use, storage and transport.
Stability	Stable at normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	None.
Incompatible materials	Strong oxidizing agents. Water, moisture.
Hazardous decomposition products	This product reacts with water, moisture or humid air to evolve following compounds: Methylethylketoxime. Thermal breakdown of this product during fire or very high heat condition may evolve the following hazardous decomposition product: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Nitrogen oxides. Formaldehyde .

11. Toxicological information

Information on likely routes of exposure

Inhalation	No adverse effects due to inhalation are expected.
Skin contact	May cause an allergic skin reaction.
Eye contact	Causes serious eye irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects

Acute toxicity

Components	Species	Test Results
3-(2-Aminoethylamino)propyltrimethoxysilane (CAS 1760-24-3)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
		16 ml/kg
Oral		
LD50	Rat	2995 mg/kg
		2400 mg/kg
Methylethylketoxime(Impurity) (CAS 96-29-7)		
Acute		
Dermal		
LD50	Rabbit	> 1000 mg/kg (Male and female)
Inhalation		
Vapor		
LC50	Rat	> 4.83 mg/l, 4 hours (Male and female)
Oral		
LD50	Rat	> 900 mg/kg (Male and female)
		2326 mg/kg (Male)

Decomposition	Species	Test Results
Methylethylketoxime (CAS 96-29-7)		
Acute		
Dermal		
LD50	Rabbit	> 1000 mg/kg (Male and female)
Inhalation		
Vapor		
LC50	Rat	> 4.83 mg/l, 4 hours (Male and female)
Oral		
LD50	Rat	> 900 mg/kg (Male and female)

Decomposition	Species	Test Results
		2326 mg/kg (Male)

Skin corrosion/irritation SKIN-RABBIT : Moderately irritating [Alkoxysilane]

Serious eye damage/eye irritation Causes serious eye damage. [Vinyloximesilane] [Methylethylketoxime]
EYE-RABBIT : 15mg SEVERE [Alkoxysilane]
Causes serious eye irritation. [Methyloximesilane]

Respiratory or skin sensitization

Respiratory sensitization Not available.

Skin sensitization May cause an allergic skin reaction. [Methyloximesilane] [Vinyloximesilane] [Methylethylketoxime]
Positive (Guinea pig) [Alkoxysilane]

Germ cell mutagenicity Negative(Ames test, Chromosome analysis, Micronucleus test) [Alkoxysilane]

Carcinogenicity Suspected of causing cancer. [Methylethylketoxime]

Reproductive toxicity Developmental toxicity: NOAEL 500mg/kg/day (Rat), Maternal toxicity: NOAEL 500mg/kg/day (Rat) [Alkoxysilane]

Specific target organ toxicity - single exposure Not available.

Specific target organ toxicity - repeated exposure May cause damage to the following organs through prolonged or repeated exposure:
Hematopoietic system. [Methyloximesilane]
Hematopoietic system. [Vinyloximesilane]

Aspiration hazard Not available.

Chronic effects Not available.

Other information Additional Information
Methyl Ethyl Ketoxime (MEKO). Material will generate MEKO on exposure to humid air gradually. Male rodents exposed to MEKO vapor at high concentration throughout their lifetime developed liver cancer. But relevance to humans is uncertain now. Please read the detail information to MEKO below
Skin Irritation ;Causes mild irritation. Can be absorbed through the skin.
Eyes Irritation ;Causes severe irritation.
Acute Oral Tox. ;LD50(rat)= >900mg/kg.
Acute Dermal Tox. ;LD50(rabbit)= >1000mg/kg.
Acute Inhalation Tox.;LC50(rat) > 4.83mg/l/4Hr
Inhalation Tox. ;Shows narcotic action at high concentration. May produce blood effects
Skin Sensitization ;Positive(guinea pig)
Neurotoxicity ;High dose can produce transient and reversible change in neurobehavioral function.
Carcinogenicity ;Liver carcinomas were observed in a lifetime inhalation study (ca.2 years) in which mice and rats were exposed.
Other Chronic Study ;Degenerative effects on the olfactory epithelium of nasal passages occured in a concentration related manner in males and females of mice and rats at MEKO concentration of 15, 75 and 375ppm. The significant change in hematological parameters were observed at 404ppm concentration.
Workplace Environmental Exposure Level; Vendor guide ; 3ppm(TWA), 10ppm(STEL), AIHA WEEL ; 10ppm(TWA)

12. Ecological information

Ecotoxicity Toxic to aquatic life. [Alkoxysilane]

Components		Species	Test Results
3-(2-Aminoethylamino)propyltrimethoxysilane (CAS 1760-24-3)			
Aquatic			
Algae	EbC50	Green algae (Selenastrum capricornutum)	5.5 mg/l, 72 hr
	ErC50	Green algae (Selenastrum capricornutum)	8.8 mg/l, 72 hr
Crustacea	EC50	Daphnia magna	90 mg/l, 48 hr
			81 mg/l, 48 hr
	NOEC	Daphnia magna	> 1 mg/l, 21 day
Fish	LC50	Brachydanio rerio	597 mg/l, 96 hr

Components		Species	Test Results
Methylethylketoxime(Impurity) (CAS 96-29-7)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	777 - 914 mg/l, 96 hours

Decomposition		Species	Test Results
Methylethylketoxime (CAS 96-29-7)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	777 - 914 mg/l, 96 hours

Persistence and degradability Causes easily hydrolysis in water or atmosphere. [Alkoxysilane]

Bioaccumulation No data available.

Mobility in soil No data available.

Mobility in general No data available.

Other hazardous effects Not available.

13. Disposal considerations

Residual waste Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Local disposal regulations Not hardening substance : Incinerate. Incinerator should be appropriately equipped for silica and other fine powder which the product will generate in incineration. Workers should wear appropriate personal protective equipment(s) such as respirator.
Hardening substance : Bury or incinerate. Incinerator should be appropriately equipped for silica and other fine powder which the product will generate in incineration. Workers should wear appropriate personal protective equipment(s) such as respirator.
Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Dispose of contents/container in accordance with local/regional/national/international regulations.

14. Transport information

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code This product is not intended to be transported in bulk.

15. Regulatory information

Applicable regulations This safety data sheet was prepared in accordance with the Regulation of Labelling and Hazard Communication of Hazardous Chemicals.

Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste

Not listed.

GHS Classification List: GHS implementation phase 1, 2 and 3 (CLA No. 0980145063, 0990146707, and 1020146801)

3-(2-Aminoethylamino)propyltrimethoxysilane (CAS 1760-24-3)
Vinyloximesilane (CAS 2224-33-1)

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Montreal Protocol

Not applicable.

Kyoto protocol

Not applicable.

Basel Convention

Not applicable.

16. Other information

References

ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
Taiwan. Dangerous Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)
Taiwan. Industrial Precursor Chemicals (Categories and Regulations Governing Inspection and Declaration of Industrial Precursor Chemicals, MOEA Decree No. 87, as amended)
Taiwan. OELs. (Standards on Workplace Atmosphere of Dangerous and Hazardous Materials)
Taiwan. Toxic Chemical Substances (TCS) (List of Toxic Chemical Substances announced by the Environmental Protection Administration)
Taiwan. Toxic Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)

This information is offered in good faith as typical values and not as a product specification. No warranty, expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.
This product has been designed, manufactured and developed solely for general industrial use only. This product is not designed for, intended for use as, or suitable for, medical, surgical or other particular purposes. Users have the sole responsibility and obligation to determine the suitability of this product for any application, to make preliminary tests, and to confirm the safety of this product for their use. Users must never use this product for the purpose of implantation into the human body and/or injection into humans.

Issue date

03-19-2018

Revision information

This document has undergone significant changes and should be reviewed in its entirety.