

# Tetramethylsilane (TMS) 99.9%

**Novachem Pty Ltd** 

Version No: **2.3**Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 4

Issue Date: **12/09/2018**Print Date: **12/09/2018**S.GHS.AUS.EN

# SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier			
Product name	Tetramethylsilane (TMS) 99.9%		
Chemical Name	tetramethylsilane		
Synonyms	DLM-43, DLM-43-50		
Proper shipping name	TETRAMETHYLSILANE		
Chemical formula	C4H12Si		
Other means of identification	Not Available		
CAS number	75-76-3*		

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses For professional use only

### Details of the supplier of the safety data sheet

Registered company name	Novachem Pty Ltd		
Address	Crissane Road, Heidelberg West Victoria 3081 Australia		
Telephone	+61384151255		
Fax	+61386250088		
Website	www.novachem.com.au		
Email	novachem@novachem.com.au		

# Emergency telephone number

Association / Organisation	Victorian Poisons Information Centre	
Emergency telephone numbers	13 11 26	
Other emergency telephone numbers	Not Available	

# **SECTION 2 HAZARDS IDENTIFICATION**

### Classification of the substance or mixture

Poisons Schedule	Not Applicable			
Classification [1]	Flammable Liquid Category 1, Serious Eye Damage Category 1			
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HSIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI			

# Label elements

Hazard pictogram(s)





SIGNAL WORD DANGE

### Hazard statement(s)

H224	Extremely flammable liquid and vapour.	
H318	Causes serious eye damage.	

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P210	Keep away from heat/sparks/open flames/hot surfaces No smoking.	
P233	Keep container tightly closed.	
P280	Wear protective gloves/protective clothing/eye protection/face protection.	
P240	Ground/bond container and receiving equipment.	

### Precautionary statement(s) Response

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	mmediately call a POISON CENTER or doctor/physician.		
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam for extinction.		
P303+P361+P353	03+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.		

### Precautionary statement(s) Storage

P403+P235 Store in a well-ventilated place. Keep cool.

## Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

### **SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**

# Substances

CAS No	%[weight]	Name
75-76-3	99.9	<u>tetramethylsilane</u>

### Mixtures

See section above for composition of Substances

### **SECTION 4 FIRST AID MEASURES**

# Description of first aid measures

If this product comes in contact with the eyes:				
Skin Contact  Flush skin and hair with running water (and soap if available).  Seek medical attention in event of irritation.  Inhalation  Inhalation  In turn in the products are inhaled remove from contaminated area.  Other measures are usually unnecessary.  Indestion  Indestion  In turn in the product in available	Eye Contact	<ul> <li>Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>Transport to hospital or doctor without delay.</li> </ul>		
Innalation  Other measures are usually unnecessary.  Innection  Innection	Skin Contact	► Flush skin and hair with running water (and soap if available).		
Ingestion	Inhalation	· · · · · · · · · · · · · · · · · · ·		
	Ingestion	Indestion 1 7 9		

## Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

# **SECTION 5 FIREFIGHTING MEASURES**

# Extinguishing media

► DO NOT use water

# Special hazards arising from the substrate or mixture

Fire Incompatibility ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters			
Fire Fighting	<ul> <li>Alert Fire Brigade and tell them location and nature of hazard.</li> <li>May be violently or explosively reactive.</li> <li>Wear full body protective clothing with breathing apparatus.</li> <li>Prevent, by any means available, spillage from entering drains or water course.</li> </ul>		
Fire/Explosion Hazard	Liquid and vapour are highly flammable. Severe fire hazard when exposed to heat, flame and/or oxidisers. Vapour forms an explosive mixture with air. Severe explosion hazard, in the form of vapour, when exposed to flame or spark. Combustion products include: carbon dioxide (CO2) silicon dioxide (SiO2) other pyrolysis products typical of burning organic material.		

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Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions **HAZCHEM** 

### **SECTION 6 ACCIDENTAL RELEASE MEASURES**

### Personal precautions, protective equipment and emergency procedures

### **Environmental precautions**

### Methods and material for containment and cleaning up

Minor Spills	<ul> <li>Remove all ignition sources.</li> <li>Clean up all spills immediately.</li> <li>Avoid breathing vapours and contact with skin and eyes.</li> <li>Control personal contact with the substance, by using protective equipment.</li> </ul>	
Major Spills	<ul> <li>Clear area of personnel and move upwind.</li> <li>Alert Fire Brigade and tell them location and nature of hazard.</li> <li>May be violently or explosively reactive.</li> <li>Wear full body protective clothing with breathing apparatus.</li> </ul>	

Personal Protective Equipment advice is contained in Section 8 of the SDS.

### **SECTION 7 HANDLING AND STORAGE**

### Precautions for safe handling

- Containers, even those that have been emptied, may contain explosive vapours.
- ▶ Do NOT cut, drill, grind, weld or perform similar operations on or near containers

### Contains low boiling substance:

Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.

Check for bulging containers.

- Safe handling Vent periodically
  - Always release caps or seals slowly to ensure slow dissipation of vapours
  - Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area.

  - Prevent concentration in hollows and sumps

### Other information

- Consider storage under inert gas. ► Store in original containers in approved flame-proof area.
  - No smoking, naked lights, heat or ignition sources.
  - DO NOT store in pits, dep basements or areas where vapours may be trapped.
- ▶ Keep containers securely sealed.

## Conditions for safe storage, including any incompatibilities

### ▶ Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid. Check that containers are clearly labelled and free from leaks Suitable container

- For low viscosity materials (i): Drums and jerry cans must be of the non-removable head type. (ii): Where a can is to be used as an inner package, the can must have a screwed enclosure.
- ► For materials with a viscosity of at least 2680 cSt. (23 deg. C)
- ▶ For manufactured product having a viscosity of at least 250 cSt.

# Storage incompatibility

- Measurement of the autoignition temperatures of several series of mono-, di-, tri- and tetra- alkylsilanes showed the ease of oxidation decreases with increasing substitution.
- ► Some alkylsilanes are easily ignited or are pyrophoric.
- BRETHERICK L.: Handbook of Reactive Chemical Hazards
- Segregate from alcohol, water.
- ▶ Explosion hazard may follow contact with incompatible materials
- Avoid reaction with oxidising agents
- ▶ NOTE: May develop pressure in containers; open carefully. Vent periodically.

# **SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

### **Control parameters**

# OCCUPATIONAL EXPOSURE LIMITS (OEL)

# INGREDIENT DATA

Not Available

### **EMERGENCY LIMITS**

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3	
tetramethylsilane	Tetramethylsilane	280 ppm	360 ppm	740 ppm	
Ingredient	Original IDLH	Original IDLH		Revised IDLH	
tetramethylsilane	Not Available	Not Available		Not Available	

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**Exposure controls** 

# Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

### Personal protection







Eye and face protection

- Safety glasses with side shields.
- Chemical goggles
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

### Skin protection

See Hand protection below

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

### Hands/feet protection

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

- ▶ Wear chemical protective gloves, e.g. PVC.
- ▶ Wear safety footwear or safety gumboots, e.g. Rubber

### Body protection

Other protection

### See Other protection below

- Overalls.
- ▶ PVC Apron.
- PVC protective suit may be required if exposure severe.
- Evewash unit.
- ▶ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- ▶ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).
- Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.

# Respiratory protection

- · Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

# **SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

### Information on basic physical and chemical properties

Appearance	Not Available		
Physical state	Liquid	Relative density (Water = 1)	0.648
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	450.00
pH (as supplied)	Not Applicable	Decomposition temperature	Not Available
Melting point / freezing point (°C)	-99	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	26-28	Molecular weight (g/mol)	88.23
Flash point (°C)	-27.22	Taste	Not Available
Evaporation rate	Fast BuAC = 1	Explosive properties	Not Available
Flammability	HIGHLY FLAMMABLE.	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	100
Vapour pressure (kPa)	80.3 @ 20 deg C	Gas group	Not Available
Solubility in water (g/L)	Reacts	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	>1	VOC g/L	Not Available

# **SECTION 10 STABILITY AND REACTIVITY**

Reactivity

See section 7

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Chemical stability	<ul> <li>Unstable in the presence of incompatible materials.</li> <li>Product is considered stable.</li> <li>Hazardous polymerisation will not occur.</li> </ul>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

# **SECTION 11 TOXICOLOGICAL INFORMATION**

Information	on	toxicological	ettects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.  Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.  The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.
Ingestion	The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Material on the skin evaporates rapidly and may cause tingling, chilling and even temporary numbness  Open cuts, abraded or irritated skin should not be exposed to this material  Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	If applied to the eyes, this material causes severe eye damage.
Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

	TOXICITY	IRRITATION
Tetramethylsilane (TMS) 99.9%	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Not Available
	Oral (rat) LD50: >2000 mg/kg <sup>[1]</sup>	
tetramethylsilane	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Not Available
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup> Oral (rat) LD50: >2000 mg/kg <sup>[1]</sup>	

Legend:

1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.\* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

TETRAMETHYLSILANE	No significant acute toxicological data identified in literature search.		
Acute Toxicity	×	Carcinogenicity	0
Skin Irritation/Corrosion	0	Reproductivity	0
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	0
Respiratory or Skin sensitisation	0	STOT - Repeated Exposure	0
Mutagenicity	0	Aspiration Hazard	0

# Legend:

X − Data available but does not fill the criteria for classification
 ✓ − Data available to make classification

O - Data Not Available to make classification

# **SECTION 12 ECOLOGICAL INFORMATION**

# Toxicity

Tetramethylsilane (TMS) 99.9%	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	48	Crustacea	>2.8mg/L	2
	EC50	72	Algae or other aquatic plants	>0.0079mg/L	2
	NOEC	72	Algae or other aquatic plants	>=0.0079mg/L	2
tetramethylsilane	ENDPOINT	TEST DUB ATION (HB)	SPECIES	VALUE	SOURCE
	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE

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EC50	48	Crustacea	>2.8mg/L	2
EC50	72	Algae or other aquatic plants	>0.0079mg/L	2
NOEC	72	Algae or other aquatic plants	>=0.0079mg/L	2

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

### DO NOT discharge into sewer or waterways.

### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
tetramethylsilane	HIGH	HIGH

### Bioaccumulative potential

Ingredient	Bioaccumulation
tetramethylsilane	LOW (LogKOW = 3.24)

### Mobility in soil

Ingredient	Mobility
tetramethylsilane	LOW (KOC = 48.64)

### **SECTION 13 DISPOSAL CONSIDERATIONS**

### Waste treatment methods

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- ▶ Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.

- Product / Packaging disposal
- ▶ DO NOT allow wash water from cleaning or process equipment to enter drains It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- ▶ Where in doubt contact the responsible authority.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material).
- ▶ Decontaminate empty containers

# **SECTION 14 TRANSPORT INFORMATION**

# **Labels Required**

	3
Marine Pollutant	NO
HAZCHEM	3YE

### Land transport (ADG)

UN number	2749		
UN proper shipping name	TETRAMETHYLSILANE		
Transport hazard class(es)	Class 3 Subrisk Not Applicable		
Packing group	I		
Environmental hazard	Not Applicable		
Special precautions for user	Special provisions Not Applicable  Limited quantity 0		

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Air transport (ICAO-IATA / DGR)

UN number	2749				
UN proper shipping name	Tetramethylsilane				
	ICAO/IATA Class	3			
Transport hazard class(es)	ICAO / IATA Subrisk	Not Applicable			
	ERG Code	3H			
Packing group	I				
Environmental hazard	Not Applicable				
Special precautions for user	Special provisions		A1		
	Cargo Only Packing In	nstructions	361		
	Cargo Only Maximum	Qty / Pack	30 L		
	Passenger and Cargo Packing Instructions		Forbidden		
	Passenger and Cargo Maximum Qty / Pack		Forbidden		
	Passenger and Cargo Limited Quantity Packing Instructions		Forbidden		
	Passenger and Cargo Limited Maximum Qty / Pack		Forbidden		

# Sea transport (IMDG-Code / GGVSee)

UN number	2749		
UN proper shipping name	TETRAMETHYLSILANE		
Transport hazard class(es)	IMDG Class 3 IMDG Subrisk Not Applicable		
Packing group			
Environmental hazard	Not Applicable		
Special precautions for user	EMS Number F-E , S-D Special provisions Not Applicable Limited Quantities 0		

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

# **SECTION 15 REGULATORY INFORMATION**

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

TETRAMETHYLSILANE(75-76-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

# **National Inventory Status**

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (tetramethylsilane)
China - IECSC	Υ
Europe - EINEC / ELINCS / NLP	Υ
Japan - ENCS	Υ
Korea - KECI	Υ
New Zealand - NZIoC	Y
Philippines - PICCS	Υ
USA - TSCA	Υ
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

# **SECTION 16 OTHER INFORMATION**

Revision Date	12/09/2018
Initial Date	06/12/2017

# Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using

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available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

### **Definitions and abbreviations**

PC – TWA: Permissible Concentration-Time Weighted Average PC-STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit。

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value LOD: Limit Of Detection OTV: Odour Threshold Value BCF: BioConcentration Factors BEI: Biological Exposure Index

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