SAFETY DATA SHEET

DOW CHEMICAL COMPANY LIMITED

Safety Data Sheet according to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law

Product name: DOWSIL™ CC-8030 Conformal Coating

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DOW CHEMICAL COMPANY LIMITED encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

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

1.1 Product identifier
Product name: DOWSIL™ CC-8030 Conformal Coating

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Use at industrial sites: Manufacture of computer, electronic and optical products, electrical equipment. Use in coatings.

1.3 Details of the supplier of the safety data sheet
COMPANY IDENTIFICATION
DOW CHEMICAL COMPANY LIMITED
5 OAKWATER AVENUE
CHEADLE ROYAL BUSINESS PARK
CHEADLE
SK8 3SR
UNITED KINGDOM

Customer Information Number:	+44 (0) 1663 746518 SDSQuestion@dow.com
Fax:	+44 (0) 1663 746605

1.4 EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 0031 115 694 982
Local Emergency Contact: 00 31 115 69 4982

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008, as retained and amended in UK law
Flammable liquids - Category 3 - H226
Eye irritation - Category 2 - H319
Long-term (chronic) aquatic hazard - Category 3 - H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008, as retained and amended in UK law

Hazard pictograms

Signal word: WARNING

Hazard statements

H226	Flammable liquid and vapour.
H319	Causes serious eye irritation.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

2.3 Other hazards

This product contains octamethylcyclotetrasiloxane (D4) that has been identified by the Member State Committee of ECHA as fulfilling the PBT and vPvB criteria laid down in Annex XIII to Regulation (EC) No 1907/2006. See Section 12 for additional information.
This product contains dodecamethylcyclohexasiloxane (D6) that has been identified by the Member State Committee of ECHA as fulfilling the vPvB criteria laid down in Annex XIII to Regulation (EC) No 1907/2006. See Section 12 for additional information.
This product contains decamethylcyclopentasiloxane (D5) that has been identified by the Member State Committee of ECHA as fulfilling the vPvB criteria laid down in Annex XIII to Regulation (EC) No 1907/2006. See Section 12 for additional information.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Silicone elastomer
3.2 Mixtures

This product is a mixture.

CASRN / EC-No. / Index-No.	UK REACH Registration Number	Concentration	Component	Classification: REGULATION (EC) No 1272/2008, as retained and amended in UK law
CASRN 68909-20-6 **EC-No.** 272-697-1 **Index-No.** 014-052-00-7	–	>= 9.0 - <= 15.0 %	silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica	STOT RE 2; H373 (Lungs) EUH066 Acute toxicity estimate Acute oral toxicity: > 2,000 mg/kg Acute dermal toxicity: > 2,000 mg/kg
CASRN 2530-83-8 **EC-No.** 219-784-2 **Index-No.** –	–	>= 0.24 - <= 1.1 %	Glycidoxypropyltrimethoxysilane	Eye Dam. 1; H318 Aquatic Chronic 3; H412 Acute toxicity estimate Acute oral toxicity: 8,025 mg/kg Acute inhalation toxicity: > 5.3 mg/l, 4 Hour, dust/mist Acute dermal toxicity: 4,250 mg/kg
CASRN 7473-98-5 **EC-No.** 231-272-0 **Index-No.** –	–	>= 0.25 - <= 1.1 %	Hydroxy-2-methyl-1-phenylpropan-1-one	Acute Tox. 4; H302 Aquatic Chronic 3; H412 Acute toxicity estimate Acute oral toxicity: 1,694 mg/kg Acute dermal toxicity: 6,929 mg/kg
CASRN 128-37-0 **EC-No.** 204-881-4 **Index-No.** –	–	>= 0.14 - <= 0.58 %	Di-t-butyl-p-cresol	Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1 Acute toxicity estimate Acute oral toxicity:

				> 6,000 mg/kg Acute dermal toxicity: > 2,000 mg/kg

CASRN 556-67-2 **EC-No.** 209-136-7 **Index-No.** 014-018-00-1	–	>= 0.023 - <= 0.035 %	octamethylcyclotetrasiloxane [D4]	Flam. Liq. 3; H226 Repr. 2; H361f Aquatic Chronic 1; H410 M-Factor (Chronic aquatic toxicity): 10 Acute toxicity estimate Acute oral toxicity: > 4,800 mg/kg Acute inhalation toxicity: 36 mg/l, 4 Hour, dust/mist Acute dermal toxicity: > 2,400 mg/kg

PBT and vPvB substance

CASRN 540-97-6 **EC-No.** 208-762-8 **Index-No.** –	–	>= 0.13 - <= 0.22 %	Dodecamethyl cyclohexasiloxane	Not classified Acute toxicity estimate Acute oral toxicity: > 2,000 mg/kg Acute dermal toxicity: > 2,000 mg/kg

CASRN 541-02-6 **EC-No.** 208-764-9 **Index-No.** –	–	>= 0.01 - <= 0.16 %	Decamethylcyclopentasiloxane	Not classified Acute toxicity estimate Acute oral toxicity: > 24,134 mg/kg Acute inhalation toxicity: 8.67 mg/l, 4 Hour, dust/mist Acute dermal toxicity: > 2,000 mg/kg

Substances with a workplace exposure limit

CASRN 1185-55-3 **EC-No.** 214-685-0 **Index-No.** –	–	>= 1.5 - <= 2.5 %	Methyltrimethoxysilane	Flam. Liq. 2; H225 Acute toxicity estimate Acute oral toxicity: 11,685 mg/kg Acute inhalation toxicity: > 7605 ppm, 6 Hour, vapour

				Acute dermal toxicity: > 9,500 mg/kg

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air and keep comfortable for breathing; consult a physician.

Skin contact: Wash off with plenty of water. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Rinse mouth with water. No emergency medical treatment necessary.

4.2 Most important symptoms and effects, both acute and delayed:
Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical. Dry sand.

Unsuitable extinguishing media: High volume water jet. Do not use direct water stream..

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products: Silicon oxides. Carbon oxides. Formaldehyde. Sulphur oxides.

Unusual Fire and Explosion Hazards: Flash back possible over considerable distance.. Exposure to combustion products may be a hazard to health.. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.. Flammable mixtures may exist within the vapor space of containers at room temperature.. Closed containers may

rupture via pressure build-up when exposed to fire or extreme heat.. Vapours may form explosive mixtures with air..

5.3 Advice for firefighters

Fire Fighting Procedures: Use water spray to cool unopened containers.. Evacuate area.. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage.. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.. Do not use a solid water stream as it may scatter and spread fire..
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Remove undamaged containers from fire area if it is safe to do so.

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus.. Use personal protective equipment..

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures: Remove all sources of ignition. Use personal protective equipment. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Vapor explosion hazard. Keep out of sewers. Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions: Do not release the product to the aquatic environment above defined regulatory levels Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up: Non-sparking tools should be used. Soak up with inert absorbent material. Suppress (knock down) gases/vapours/mists with a water spray jet. Clean up remaining materials from spill with suitable absorbant. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.

6.4 Reference to other sections:
See sections: 7, 8, 11, 12 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling: Do not get on skin or clothing. Avoid inhalation of vapour or mist. Do not swallow. Do not get in eyes. Keep container tightly closed. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment. Non-sparking tools should be used. Handle in accordance with good industrial hygiene and safety practice. CONTAINERS MAY BE HAZARDOUS WHEN

EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied.
Use with local exhaust ventilation. Use only in an area equipped with explosion proof exhaust ventilation. Ground and bond container and receiving equipment.

7.2 Conditions for safe storage, including any incompatibilities: Keep in properly labelled containers. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

Do not store with the following product types: Strong oxidizing agents. Organic peroxides. Flammable solids. Pyrophoric liquids. Pyrophoric solids. Self-heating substances and mixtures. Substances and mixtures, which in contact with water, emit flammable gases. Explosives. Gases.
Unsuitable materials for containers**:** None known.

7.3 Specific end use(s): See the technical data sheet on this product for further information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Glycidoxypropyltrimethoxysilane	Dow IHG	TWA	0.5 ppm
Di-t-butyl-p-cresol	ACGIH	TWA Inhalable fraction and vapor	2 mg/m3
	Further information: A4: Not classifiable as a human carcinogen		
	GB EH40	TWA	10 mg/m3
octamethylcyclotetrasiloxane [D4]	US WEEL	TWA	10 ppm
Decamethylcyclopentasiloxane	US WEEL	TWA	10 ppm
Methyltrimethoxysilane	Dow IHG	TWA	7.5 ppm
methanol	ACGIH	TWA	200 ppm
	Further information: Skin: Danger of cutaneous absorption		
	ACGIH	STEL	250 ppm
	Further information: Skin: Danger of cutaneous absorption		
	GB EH40	TWA	266 mg/m3 200 ppm
	Further information: Sk: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.		
	GB EH40	STEL	333 mg/m3 250 ppm
	Further information: Sk: Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.		

The following substance(s), which have Occupational Exposure Limit(s) (OEL), may be formed during handling or processing:
Methanol.
Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
methanol	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI

Recommended monitoring procedures

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with the Occupational Exposure Limits and the 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 should be analysed by an accredited laboratory.

Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy); European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents); European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents). Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

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.
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods.
Health and Safety Executive (HSE), United Kingdom: Methods for the Determination of Hazardous Substances.
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany.
L'Institut National de Recherche et de Securité, (INRS), France.

Derived No Effect Level

Glycidoxypropyltrimethoxysilane

Workers

Acute systemic effects		***Acute local effects***		***Long-term systemic effects***		***Long-term local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	10 mg/kg bw/day	70.5 mg/m3	n.a.	n.a.

Consumers

Acute systemic effects			***Acute local effects***		***Long-term systemic effects***			***Long-term local effects***	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	26400 mg/m3	n.a.	n.a.	n.a.	5 mg/kg bw/day	17 mg/m3	5 mg/kg bw/day	n.a.	n.a.

Hydroxy-2-methyl-1-phenylpropan-1-one

Workers

Acute systemic effects		***Acute local effects***		***Long-term systemic effects***		***Long-term local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	1 mg/kg bw/day	3.5 mg/m3	n.a.	n.a.

Consumers

Acute systemic effects			***Acute local effects***		***Long-term systemic effects***			***Long-term local effects***	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	0.5 mg/kg bw/day	0.9 mg/m3	0.4 mg/kg bw/day	n.a.	n.a.

Di-t-butyl-p-cresol

Workers

Acute systemic effects		***Acute local effects***		***Long-term systemic effects***		***Long-term local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	0.5 mg/kg bw/day	1.76 mg/m3	n.a.	n.a.

Consumers

Acute systemic effects			***Acute local effects***		***Long-term systemic effects***			***Long-term local effects***	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	0.25 mg/kg bw/day	0.435 mg/m3	0.25 mg/kg bw/day	n.a.	n.a.

octamethylcyclotetrasiloxane [D4]

Workers

Acute systemic effects		***Acute local effects***		***Long-term systemic effects***		***Long-term local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	73 mg/m3	n.a.	73 mg/m3

Consumers

Acute systemic effects			***Acute local effects***		***Long-term systemic effects***			***Long-term local effects***	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	13 mg/m3	3.7 mg/kg bw/day	n.a.	13 mg/m3

Dodecamethyl cyclohexasiloxane

Workers

Acute systemic effects		***Acute local effects***		***Long-term systemic effects***		***Long-term local effects***	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	6.1 mg/m3	n.a.	n.a.	n.a.	1.22 mg/m3

Consumers

Acute systemic effects			*Acute local effects*		*Long-term systemic effects*			*Long-term local effects*	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	1.5 mg/m3	n.a.	n.a.	n.a.	n.a.	0.3 mg/m3

Decamethylcyclopentasiloxane

Workers

Acute systemic effects		*Acute local effects*		*Long-term systemic effects*		*Long-term local effects*	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	97.3 mg/m3	n.a.	24.2 mg/m3

Consumers

Acute systemic effects			*Acute local effects*		*Long-term systemic effects*			*Long-term local effects*	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	17.3 mg/m3	5 mg/kg bw/day	n.a.	4.3 mg/m3

Methyltrimethoxysilane

Workers

Acute systemic effects		*Acute local effects*		*Long-term systemic effects*		*Long-term local effects*	
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	3.6 mg/m3	25.6 mg/m3	n.a.	n.a.

Consumers

Acute systemic effects			*Acute local effects*		*Long-term systemic effects*			*Long-term local effects*	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	n.a.	n.a.	n.a.	n.a.	7.2 mg/m3	6.25 mg/m3	0.26 mg/m3	n.a.	n.a.

Predicted No Effect Concentration

Glycidoxypropyltrimethoxysilane

Compartment	**PNEC**
Fresh water	0.45 mg/l
Intermittent use/release	0.45 mg/l
Marine water	0.045 mg/l
Sewage treatment plant	8.2 mg/l
Fresh water sediment	1.6 mg/kg dry weight (d.w.)
Marine sediment	0.16 mg/kg dry weight (d.w.)
Soil	0.063 mg/kg dry weight (d.w.)

Hydroxy-2-methyl-1-phenylpropan-1-one

Compartment	**PNEC**
Fresh water	0.002 mg/l
Marine water	0.0 mg/l
Intermittent use/release	0.019 mg/l
Sewage treatment plant	45 mg/l
Fresh water sediment	0.021 mg/kg dry weight (d.w.)
Marine sediment	0.002 mg/kg dry weight (d.w.)
Soil	0.003 mg/kg food

Di-t-butyl-p-cresol

Compartment	**PNEC**
Fresh water	199 ng/L
Intermittent use/release	0.00199 mg/l
Marine water	19.9 ng/L
Sewage treatment plant	0.017 mg/l
Fresh water sediment	0.45819 mg/kg dry weight (d.w.)
Marine sediment	0.04582 mg/kg dry weight (d.w.)
Soil	0.0539 mg/kg dry weight (d.w.)

octamethylcyclotetrasiloxane [D4]

Compartment	**PNEC**
Fresh water	0.0015 mg/l
Marine water	0.00015 mg/l
Sewage treatment plant	10 mg/l
Fresh water sediment	3 mg/kg dry weight (d.w.)
Marine sediment	0.3 mg/kg dry weight (d.w.)
Soil	0.84 mg/kg dry weight (d.w.)
Oral	41 mg/kg food

Dodecamethyl cyclohexasiloxane

Compartment	**PNEC**
Fresh water sediment	13.5 mg/kg dry weight (d.w.)
Marine sediment	1.35 mg/kg dry weight (d.w.)
Oral	66.7 mg/kg food

Decamethylcyclopentasiloxane

Compartment	**PNEC**
Fresh water	> 0.0012 mg/l
Marine water	> 0.00012 mg/l
Fresh water sediment	11 mg/kg
Marine sediment	1.1 mg/kg
Soil	2.54 mg/kg

Sewage treatment plant	10 mg/l
Oral	16 mg/kg food

Methyltrimethoxysilane

Compartment	**PNEC**
Fresh water sediment	0.73 mg/kg
Marine sediment	0.073 mg/kg
Soil	0.03 mg/kg

8.2 Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin protection

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Natural rubber ("latex"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 4 or higher (breakthrough time greater than 120 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 1 or higher (breakthrough time greater than 10 minutes according to EN 374) is recommended. Glove thickness alone is not a good indicator of the level of protection a glove provides against a chemical substance as this level of protection is also highly dependent on the specific composition of the material that the glove is fabricated from. The thickness of the glove must, depending on model and type of material, generally be more than 0.35 mm to offer sufficient protection for prolonged and frequent contact with the substance. As an exception to this general rule it is known that multilayer laminate gloves may offer prolonged protection at thicknesses less than 0.35 mm. Other glove materials with a thickness of less than 0.35 mm may offer sufficient protection when only brief contact is expected. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	
Physical state	liquid
Color	Hazy
Odor	Mercaptans.
Odor Threshold	No data available
pH	Not applicable, substance/mixture is non-soluble (in water)
Melting point/range	No data available
Freezing point	No data available
Boiling point (760 mmHg)	> 100 °C
Flash point	Approximately57.5 °C
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not Applicable
Flammability (liquids)	Sustains combustion
Lower explosion limit	Not determined
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	0.98
Water solubility	insoluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Dynamic Viscosity	488 cP at 25 °C
Kinematic Viscosity	410 mm2/s at 25 °C > 20.5 mm2/s at 40 °C
Explosive properties	No data available
Oxidizing properties	The substance or mixture is not classified as oxidizing.

9.2 Other information

Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: Not classified as a reactivity hazard.

10.2 Chemical stability: Stable under normal conditions.

10.3 Possibility of hazardous reactions: Can react with strong oxidizing agents. Vapours may form explosive mixture with air. Flammable liquid and vapour.

10.4 Conditions to avoid: Avoid static discharge. Heat, flames and sparks.

10.5 Incompatible materials: Avoid contact with oxidizing materials.

10.6 Hazardous decomposition products:
Decomposition products can include and are not limited to: Formaldehyde. Methanol.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data are available.

11.1 Information on toxicological effects

Information on likely routes of exposure
Inhalation, Eye contact, Skin contact, Ingestion.

Acute toxicity (represents short term exposures with immediate effects - no chronic/delayed effects known unless otherwise noted)

Acute Toxicity Endpoints:

Acute oral toxicity

Information for the Product:

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined.

Based on information for component(s):
LD50, Rat, > 5,000 mg/kg Estimated.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials: LD50, Rat, > 2,000 mg/kg OECD 401 or equivalent No deaths occurred at this concentration.

Glycidoxypropyltrimethoxysilane
LD50, Rat, male and female, 8,025 mg/kg OECD 401 or equivalent

This substance may hydrolyze to release Methanol. Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.

Hydroxy-2-methyl-1-phenylpropan-1-one

LD50, Rat, male and female, 1,694 mg/kg OECD Test Guideline 401

Di-t-butyl-p-cresol
LD50, Rat, > 6,000 mg/kg OECD Test Guideline 401

octamethylcyclotetrasiloxane [D4]
LD50, Rat, male, > 4,800 mg/kg No deaths occurred at this concentration.

Dodecamethyl cyclohexasiloxane
LD50, Rat, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Decamethylcyclopentasiloxane
LD50, Rat, male and female, > 24,134 mg/kg

Methyltrimethoxysilane
LD50, Rat, male and female, 11,685 mg/kg

This substance may hydrolyze to release Methanol. Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.

Acute dermal toxicity

Information for the Product:

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product: The dermal LD50 has not been determined.

Based on information for component(s):
LD50, Rabbit, > 2,000 mg/kg Estimated.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
The dermal LD50 has not been determined.

For similar material(s): LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Glycidoxypropyltrimethoxysilane
LD50, Rabbit, male, 4,250 mg/kg OECD 402 or equivalent

This substance may hydrolyze to release Methanol. Effects of methanol are the same as observed via oral and inhalation exposure and include central nervous system (CNS) depression, visual impairment up to blindness, metabolic acidosis, with effects on organ systems such as liver, kidneys and heart, even death.

Hydroxy-2-methyl-1-phenylpropan-1-one
LD50, Rat, male and female, 6,929 mg/kg OECD Test Guideline 402

Di-t-butyl-p-cresol
LD50, Rat, male and female, > 2,000 mg/kg OECD Test Guideline 402 No deaths occurred at this concentration.

octamethylcyclotetrasiloxane [D4]
LD50, Rat, male and female, > 2,400 mg/kg No deaths occurred at this concentration.

Dodecamethyl cyclohexasiloxane
LD50, Rabbit, male and female, > 2,000 mg/kg

Decamethylcyclopentasiloxane
LD50, Rabbit, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Methyltrimethoxysilane
LD50, Rabbit, male and female, > 9,500 mg/kg OECD 402 or equivalent

This substance may hydrolyze to release Methanol. Effects of methanol are the same as observed via oral and inhalation exposure and include central nervous system (CNS) depression, visual impairment up to blindness, metabolic acidosis, with effects on organ systems such as liver, kidneys and heart, even death.

Acute inhalation toxicity

Information for the Product:

Brief exposure (minutes) is not likely to cause adverse effects. Vapor from heated material or mist may cause respiratory irritation.

As product: The LC50 has not been determined.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
The LC50 has not been determined.

Glycidoxypropyltrimethoxysilane
LC50, Rat, 4 Hour, dust/mist, > 5.3 mg/l

This substance may hydrolyze to release Methanol. Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death.

Hydroxy-2-methyl-1-phenylpropan-1-one
The LC50 has not been determined.

Di-t-butyl-p-cresol
The LC50 has not been determined.

octamethylcyclotetrasiloxane [D4]
LC50, Rat, male and female, 4 Hour, dust/mist, 36 mg/l OECD Test Guideline 403

Dodecamethyl cyclohexasiloxane

The LC50 has not been determined.

Decamethylcyclopentasiloxane
LC50, Rat, male and female, 4 Hour, dust/mist, 8.67 mg/l

Methyltrimethoxysilane
LC50, Rat, male and female, 6 Hour, vapour, > 7605 ppm OECD Test Guideline 403

This substance may hydrolyze to release Methanol. Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death.

Skin corrosion/irritation

Information for the Product:

Based on information for component(s):
Brief contact may cause slight skin irritation with local redness.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials:
Brief contact is essentially nonirritating to skin.
Repeated exposure may cause skin dryness or cracking.

Glycidoxypropyltrimethoxysilane
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.

Hydroxy-2-methyl-1-phenylpropan-1-one
Brief contact may cause slight skin irritation with local redness.

Di-t-butyl-p-cresol
Brief contact is essentially nonirritating to skin.
Prolonged contact may cause slight skin irritation with local redness.

octamethylcyclotetrasiloxane [D4]
Brief contact is essentially nonirritating to skin.

Dodecamethyl cyclohexasiloxane
Essentially nonirritating to skin.

Decamethylcyclopentasiloxane
Prolonged contact is essentially nonirritating to skin.

Methyltrimethoxysilane
Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

Causes serious eye irritation.

Information for the Product:

Based on information for component(s):
May cause moderate eye irritation.
May cause corneal injury.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials:
May cause irritation or corneal injury due to mechanical action.

Glycidoxypropyltrimethoxysilane
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Hydroxy-2-methyl-1-phenylpropan-1-one
May cause slight eye irritation.
May cause slight corneal injury.

Di-t-butyl-p-cresol
May cause slight eye irritation.
May cause slight temporary corneal injury.

octamethylcyclotetrasiloxane [D4]
Essentially nonirritating to eyes.

Dodecamethyl cyclohexasiloxane
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Decamethylcyclopentasiloxane
Essentially nonirritating to eyes.

Methyltrimethoxysilane
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization

Information for the Product:

For skin sensitization:
Contains component(s) which did not cause allergic skin sensitization in guinea pigs.

For respiratory sensitization:
No relevant data found.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
For skin sensitization:
Based on testing for product(s) in this family of materials:
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Glycidoxypropyltrimethoxysilane
Did not cause allergic skin reactions when tested in guinea pigs.
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:
No relevant data found.

Hydroxy-2-methyl-1-phenylpropan-1-one
For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Di-t-butyl-p-cresol
Skin contact may cause an allergic skin reaction in a small proportion of individuals.

For respiratory sensitization:
No relevant data found.

octamethylcyclotetrasiloxane [D4]
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Dodecamethyl cyclohexasiloxane
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Decamethylcyclopentasiloxane
Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Methyltrimethoxysilane
For skin sensitization:
Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Glycidoxypropyltrimethoxysilane
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Hydroxy-2-methyl-1-phenylpropan-1-one
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Di-t-butyl-p-cresol
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

octamethylcyclotetrasiloxane [D4]
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Dodecamethyl cyclohexasiloxane
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Decamethylcyclopentasiloxane
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Methyltrimethoxysilane
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Aspiration Hazard

Information for the Product:

Based on physical properties, not likely to be an aspiration hazard.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on physical properties, not likely to be an aspiration hazard.

Glycidoxypropyltrimethoxysilane
Based on available information, aspiration hazard could not be determined.

Hydroxy-2-methyl-1-phenylpropan-1-one
Based on physical properties, not likely to be an aspiration hazard.

Di-t-butyl-p-cresol

Based on physical properties, not likely to be an aspiration hazard.

octamethylcyclotetrasiloxane [D4]
May be harmful if swallowed and enters airways.

Dodecamethyl cyclohexasiloxane
Based on physical properties, not likely to be an aspiration hazard.

Decamethylcyclopentasiloxane
Based on physical properties, not likely to be an aspiration hazard.

Methyltrimethoxysilane
Material is not classified as an aspiration hazard based on insufficient data, however materials with low viscosity may be aspirated into the lungs during ingestion or vomiting.

Chronic toxicity (represents longer term exposures with repeated dose resulting in chronic/delayed effects - no immediate effects known unless otherwise noted)

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
In animals, effects have been reported on the following organs:
lung
Due to the physical state of the material, this component is not expected to be bioavailable under normal handling and processing conditions.

Glycidoxypropyltrimethoxysilane
For similar material(s):
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Hydroxy-2-methyl-1-phenylpropan-1-one
In animals, effects have been reported on the following organs:
Liver

Di-t-butyl-p-cresol
BHT is toxic only at concentrations much higher than normally consumed in man, causing organ changes (liver, lung, brain, thyroid, kidney) and anti-clotting effects; however, it may enhance or inhibit the effects of other substances.

octamethylcyclotetrasiloxane [D4]
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Respiratory tract.
Female reproductive organs.

Dodecamethyl cyclohexasiloxane
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Decamethylcyclopentasiloxane
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Methyltrimethoxysilane
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Carcinogenicity

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
No relevant data found.

Glycidoxypropyltrimethoxysilane
Did not cause cancer in laboratory animals.

Hydroxy-2-methyl-1-phenylpropan-1-one
No relevant data found.

Di-t-butyl-p-cresol
It is generally recognized that at high doses BHT may act as a promoter or inhibitor of certain tumor formation in laboratory animals; at the maximum acceptable daily intake for man it is not believed to cause cancer.

octamethylcyclotetrasiloxane [D4]
Results from a 2 year repeated vapour inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. This finding occurred at the highest exposure dose (700 ppm) only. Studies to date have not demonstrated if these effects occur through pathways that are relevant to humans. Repeated exposure in rats to D4 resulted in protoporphyrin accumulation in the liver. Without knowledge of the specific mechanism leading to the protoporphyrin accumulation the relevance of this finding to humans is unknown.

Dodecamethyl cyclohexasiloxane
No relevant data found.

Decamethylcyclopentasiloxane
Results from a 2 year repeated vapour inhalation exposure study to rats of decamethylcyclopentasiloxane (D5) indicate effects (uterine endometrial tumors) in female animals. This finding occurred at the highest exposure dose (160 ppm) only. Studies to date have not demonstrated if this effect occurs through a pathway that is relevant to humans.

Methyltrimethoxysilane
No relevant data found.

Teratogenicity

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials: Did not cause birth defects or any other fetal effects in laboratory animals.

Glycidoxypropyltrimethoxysilane
Did not cause birth defects or any other fetal effects in laboratory animals.

Hydroxy-2-methyl-1-phenylpropan-1-one
Did not cause birth defects or any other fetal effects in laboratory animals.

Di-t-butyl-p-cresol
Did not cause birth defects in laboratory animals.

octamethylcyclotetrasiloxane [D4]
Did not cause birth defects or any other fetal effects in laboratory animals.

Dodecamethyl cyclohexasiloxane
No relevant data found.

Decamethylcyclopentasiloxane
Did not cause birth defects or any other fetal effects in laboratory animals.

Methyltrimethoxysilane
Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials: In animal studies, did not interfere with reproduction.

Glycidoxypropyltrimethoxysilane
In animal studies, did not interfere with reproduction.

Hydroxy-2-methyl-1-phenylpropan-1-one
In animal studies, did not interfere with reproduction.

Di-t-butyl-p-cresol
Available data are inadequate to determine effects on reproduction.

octamethylcyclotetrasiloxane [D4]
In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, has been shown to interfere with fertility.

Dodecamethyl cyclohexasiloxane
In animal studies, did not interfere with reproduction.

Decamethylcyclopentasiloxane
In animal studies, did not interfere with reproduction.

Methyltrimethoxysilane
In animal studies, did not interfere with reproduction.

Mutagenicity

Information for the Product:

Product test data not available.

Information for components:

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Based on testing for product(s) in this family of materials: In vitro genetic toxicity studies were negative.

Glycidoxypropyltrimethoxysilane
Glycidoxypropyltrimethoxysilane was found to be genetically active in Ames reverse mutation assays, In Vitro sister chromatid exchange assays, and an In Vivo mouse micronucleus assay. This ingredient was not genetically active in an In Vivo cytogenetic assay (mice) or in an In Vivo sister chromatid exchange assay (rabbits, rats). The potential relevance of these data to humans is not known.

Hydroxy-2-methyl-1-phenylpropan-1-one
In vitro genetic toxicity studies were negative.

Di-t-butyl-p-cresol
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were predominantly negative.

octamethylcyclotetrasiloxane [D4]
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Dodecamethyl cyclohexasiloxane
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Decamethylcyclopentasiloxane
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Methyltrimethoxysilane
In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data are available.

12.1 Toxicity

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica

Acute toxicity to fish
Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).
Based on testing for product(s) in this family of materials:
LC50, Danio rerio (zebra fish), 96 Hour, > 1,000 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
Based on testing for product(s) in this family of materials:
EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
ErC50, Scenedesmus quadricauda (Green algae), 72 Hour, > 10,000 mg/l, OECD Test Guideline 201

Toxicity to bacteria
Based on testing for product(s) in this family of materials:
EC50, activated sludge, 3 Hour, Respiration rates., > 1,000 mg/l, OECD Test Guideline 209

Glycidoxypropyltrimethoxysilane

Acute toxicity to fish
Material is harmful to aquatic organisms (LC50/EC50/IC50 between 10 and 100 mg/L in the most sensitive species).
LC50, Carp (Cyprinus carpio), semi-static test, 96 Hour, 55 mg/l, Directive 67/548/EEC, Annex V, C.1.

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), static test, 48 Hour, 324 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (algae), static test, 96 Hour, Growth rate, 350 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (algae), static test, 96 Hour, Growth rate, 130 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
EC50, activated sludge, Static, 3 Hour, Respiration rates., > 100 mg/l, OECD 209 Test

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 100 mg/l

Hydroxy-2-methyl-1-phenylpropan-1-one

Acute toxicity to fish
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
LC50, Leuciscus idus (Golden orfe), 48 Hour, 160 mg/l, DIN 38412

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna, Static, 48 Hour, > 119 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
EC50, Desmodesmus subspicatus (green algae), Static, 72 Hour, Growth rate, 1.95 mg/l, OECD Test Guideline 201
NOEC, Desmodesmus subspicatus (green algae), Static, 72 Hour, Growth rate, 0.194 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, activated sludge, 3 Hour, Respiration rates., > 1,000 mg/l, OECD Test Guideline 209

Di-t-butyl-p-cresol

Acute toxicity to fish
Material is very toxic to aquatic organisms (LC50/EC50/IC50 below 1 mg/L in the most sensitive species).
LC50, Danio rerio (zebra fish), 96 Hour, > 0.57 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 0.48 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC10, Desmodesmus subspicatus (green algae), 72 Hour, 0.4 mg/l, Directive 67/548/EEC, Annex V, C.3.
EC50, Desmodesmus subspicatus (green algae), 72 Hour, > 0.4 mg/l, Directive 67/548/EEC, Annex V, C.3.

Toxicity to bacteria
EC50, 3 Hour, > 10,000 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 0.07 mg/l

octamethylcyclotetrasiloxane [D4]

Acute toxicity to fish
Based on testing of comparable products: The estimated maximum aqueous concentration of Octamethyl Cyclotetrasiloxane (D4) from migration to water from the product as supplied is below the D4 established no-effect threshold (< 0.0079 mg/L) for aquatic organisms.

Chronic toxicity to aquatic invertebrates
Based on testing for product(s) in this family of materials:
Not classified due to data which are conclusive although insufficient for classification.

Dodecamethyl cyclohexasiloxane

Acute toxicity to algae/aquatic plants
Not expected to be acutely toxic to aquatic organisms.

No toxicity at the limit of solubility
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, > 0.002 mg/l

Decamethylcyclopentasiloxane

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
No toxicity at the limit of solubility
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 16 µg/l, OECD Test Guideline 204 or Equivalent

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Daphnia magna, 48 Hour, > 2.9 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate, > 0.012 mg/l
No toxicity at the limit of solubility
NOEC, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate, 0.012 mg/l

Chronic toxicity to fish
No toxicity at the limit of solubility
LC50, Oncorhynchus mykiss (rainbow trout), 14 d, > 16 mg/l
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), 45 d, >= 0.017 mg/l
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), 90 d, >= 0.014 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna, 21 d, 0.015 mg/l

Toxicity to soil-dwelling organisms
This product does not have any known adverse effect on the soil organisms tested.
NOEC, Eisenia fetida (earthworms), >= 76 mg/kg

Methyltrimethoxysilane

Acute toxicity to fish
Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 110 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), flow-through test, 48 Hour, > 122 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 3.6 mg/l, OECD Test Guideline 201
No toxicity at the limit of solubility
NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, >= 3.6 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC10, activated sludge, 3 Hour, Respiration rates., > 100 mg/l, OECD Test Guideline 209

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 28 d, number of offspring, >= 10 mg/l

12.2 Persistence and degradability

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
Biodegradability: Biodegradation is not applicable.

Glycidoxypropyltrimethoxysilane
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Fail
Biodegradation: 37 %
Exposure time: 28 d
Method: Regulation (EC) No. 440/2008, Annex, C.4-A

Stability in Water (1/2-life)
Hydrolysis, DT50, 6.5 Hour, pH 7, Half-life Temperature 24.5 °C, OECD Test Guideline 111
Hydrolysis, DT50, 0.15 Hour, pH 5, Half-life Temperature 24.5 °C, OECD Test Guideline 111
Hydrolysis, DT50, 0.002 Hour, pH 9, Half-life Temperature 24.5 °C, OECD Test Guideline 111

Hydroxy-2-methyl-1-phenylpropan-1-one
Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Biodegradation: 90 - 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Di-t-butyl-p-cresol
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Fail
Biodegradation: 4.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent

octamethylcyclotetrasiloxane [D4]
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 3.7 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Stability in Water (1/2-life)
Hydrolysis, DT50, 3.9 d, pH 7, Half-life Temperature 25 °C, OECD Test Guideline 111

Dodecamethyl cyclohexasiloxane

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
10-day Window: Fail
Biodegradation: 4.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Decamethylcyclopentasiloxane

Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 0.14 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Methyltrimethoxysilane

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Biodegradation: 54 %
Exposure time: 28 d
Method: Regulation (EC) No. 440/2008, Annex, C.4-A

12.3 Bioaccumulative potential

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica

Bioaccumulation: No relevant data found.

Glycidoxypropyltrimethoxysilane

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.5 Estimated by Structure-Activity Relationship (SAR).

Hydroxy-2-methyl-1-phenylpropan-1-one

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.62 OECD Test Guideline 107 or Equivalent
Bioconcentration factor (BCF): 0.63 Fish

Di-t-butyl-p-cresol

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 4.17 - 5.10 Estimated.
Bioconcentration factor (BCF): 598.4 Fish Estimated.

octamethylcyclotetrasiloxane [D4]

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 6.49 Measured
Bioconcentration factor (BCF): 12,400 Pimephales promelas (fathead minnow) Measured

Dodecamethyl cyclohexasiloxane
Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 8.87

Decamethylcyclopentasiloxane
Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 5.2 Measured
Bioconcentration factor (BCF): 2,010 Fish Estimated.

Methyltrimethoxysilane
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.82 Estimated.

12.4 Mobility in soil

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
No relevant data found.

Glycidoxypropyltrimethoxysilane
No relevant data found.

Hydroxy-2-methyl-1-phenylpropan-1-one
Partition coefficient (Koc): 10.67 Estimated.

Di-t-butyl-p-cresol
Partition coefficient (Koc): > 5000 Estimated.

octamethylcyclotetrasiloxane [D4]
Partition coefficient (Koc): 16596 OECD Test Guideline 106

Dodecamethyl cyclohexasiloxane
Partition coefficient (Koc): > 5000

Decamethylcyclopentasiloxane
Partition coefficient (Koc): > 5000 Estimated.

Methyltrimethoxysilane
No relevant data found.

12.5 Results of PBT and vPvB assessment

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica
This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Glycidoxypropyltrimethoxysilane

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Hydroxy-2-methyl-1-phenylpropan-1-one

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Di-t-butyl-p-cresol

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

octamethylcyclotetrasiloxane [D4]

Octamethylcyclotetrasiloxane (D4) meets the current criteria for PBT and vPvB under REACh Annex XIII or other regionally specific criteria. However, D4 does not behave similarly to known PBT/vPvB substances. The weight of scientific evidence from field studies shows that D4 is not biomagnifying in aquatic and terrestrial food webs. D4 in air will degrade by reaction with naturally occurring hydroxyl radicals in the atmosphere. Any D4 in air that does not degrade by reaction with hydroxyl radicals is not expected to deposit from the air to water, to land, or to living organisms.

Dodecamethyl cyclohexasiloxane

Dodecamethyl cyclohexasiloxane (D6) meets the current REACh Annex XIII criteria for vPvB. However, D6 does not behave similarly to known PBT/vPvB substances. The weight of scientific evidence from field studies shows that D6 is not biomagnifying in aquatic and terrestrial food webs. D6 in air will degrade by reaction with naturally occurring hydroxyl radicals in the atmosphere. Any D6 in air that does not degrade by reaction with hydroxyl radicals is not expected to deposit from the air to water, to land, or to living organisms.

Decamethylcyclopentasiloxane

Decamethylcyclopentasiloxane (D5) meets the current REACh Annex XIII criteria for vPvB. However, D5 does not behave similarly to known PBT/vPvB substances. The weight of scientific evidence from field studies shows that D5 is not biomagnifying in aquatic and terrestrial food webs. D5 in air will degrade by reaction with naturally occurring hydroxyl radicals in the atmosphere. Any D5 in air that does not degrade by reaction with hydroxyl radicals is not expected to deposit from the air to water, to land, or to living organisms. Based on an independent scientific panel of experts, the Canadian Minister of the Environment has concluded that "D5 is not entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity, or that constitute or may constitute a danger to the environment on which life depends".
This substance is considered to be persistent, bioaccumulating and toxic (PBT).
This substance is considered to be very persistent and very bioaccumulating (vPvB).

Methyltrimethoxysilane

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Glycidoxypropyltrimethoxysilane

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Hydroxy-2-methyl-1-phenylpropan-1-one
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Di-t-butyl-p-cresol
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

octamethylcyclotetrasiloxane [D4]
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Dodecamethyl cyclohexasiloxane
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Decamethylcyclopentasiloxane
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Methyltrimethoxysilane
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Do not dump into any sewers, on the ground, or into any body of water. This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to ECDirective 2008/98/EC, provided it fulfils the criteria listed in Annex III of this directive. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required.

The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

SECTION 14: TRANSPORT INFORMATION

Classification for ROAD and Rail transport (ADR/RID):

14.1	**UN number or ID number**	UN 1993
14.2	**UN proper shipping name**	FLAMMABLE LIQUID, N.O.S.(Methyltrimethoxysilane)
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Not considered environmentally hazardous based on available data.
14.6	**Special precautions for user**	Hazard Identification Number: 30

Classification for INLAND waterways (ADNR/ADN):

Consult your Dow contact before transporting by inland waterway

Classification for SEA transport (IMO-IMDG):

14.1	**UN number or ID number**	UN 1993
14.2	**UN proper shipping name**	FLAMMABLE LIQUID, N.O.S.(Methyltrimethoxysilane)
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Not considered as marine pollutant based on available data.
14.6	**Special precautions for user**	EmS: F-E, S-E
14.7	**Maritime transport in bulk according to IMO instruments**	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

14.1	**UN number or ID number**	UN 1993
14.2	**UN proper shipping name**	Flammable liquid, n.o.s.(Methyltrimethoxysilane)
14.3	**Transport hazard class(es)**	3
14.4	**Packing group**	III
14.5	**Environmental hazards**	Not applicable
14.6	**Special precautions for user**	No data available.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: REGULATORY INFORMATION

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

UK REACH - UK Statutory Instruments 2019 No.758 as amended
This product contains only components that have been either registered, notified for downstream user import (DUIN), are exempt from registration, are regarded as registered or are not subject to registration according to UK Statutory Instruments 2019 No.758 as amended (UK REACH)., Polymers are exempted from registration under REACH. All relevant starting materials and additives have been registered, notified for downstream user import (DUIN) or are exempt from registration according to UK Statutory Instruments 2019 No.758 as amended (UK REACH)., The aforementioned indications of the UK REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied, is given. It is the

buyer's/user's responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

UK REACH List of restrictions (Annex 17)

Conditions of restriction for the following entries should be considered:
Number on list 3
octamethylcyclotetrasiloxane [D4] (Number on list 70)
Decamethylcyclopentasiloxane (Number on list 70)

Authorisation status under REACH:
The following substance/s contained in this product might be or is/are subject to authorization in accordance with REACH:

CAS-No.: 556-67-2	Name: octamethylcyclotetrasiloxane [D4]

Authorisation status: listed in the Candidate List of Substances of Very High Concern for Authorisation
Authorisation number: Not available
Sunset date: Not available
Exempted (Categories of) Uses: Not available

CAS-No.: 540-97-6	Name: Dodecamethyl cyclohexasiloxane

Authorisation status: listed in the Candidate List of Substances of Very High Concern for Authorisation
Authorisation number: Not available
Sunset date: Not available
Exempted (Categories of) Uses: Not available

CAS-No.: 541-02-6	Name: Decamethylcyclopentasiloxane

Authorisation status: listed in the Candidate List of Substances of Very High Concern for Authorisation
Authorisation number: Not available
Sunset date: Not available
Exempted (Categories of) Uses: Not available

Control of Major Accident Hazards Regulations 2015 (COMAH)
Listed in Regulation: FLAMMABLE LIQUIDS
Number in Regulation: P5c
5,000 t
50,000 t

Further information
Take note of The Management of Health and Safety at Work Regulations 1999 (requirements relating to new and expectant mothers at work contained in Regulation 16 to 18) and of the Pregnant Workers Directive 92/85/EEC.

Take note of The Management of Health and Safety at Work Regulations 1999 (requirements relating to protection of young people at work contained in Regulation 19) and of Directive 94/33/EC on the protection of young people at work.

15.2 Chemical safety assessment
No Chemical Safety Assessment has been carried out for this substance/mixture.

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H361f	Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) No 1272/2008

Flam. Liq. - 3 - H226 - Based on product data or assessment
Eye Irrit. - 2 - H319 - Calculation method
Aquatic Chronic - 3 - H412 - Calculation method

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Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
Dow IHG	Dow Industrial Hygiene Guideline
GB EH40	UK. EH40 WEL - Workplace Exposure Limits
STEL	Short-term exposure limit
TWA	Time weighted average
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)
Acute Tox.	Acute toxicity
Aquatic Acute	Short-term (acute) aquatic hazard
Aquatic Chronic	Long-term (chronic) aquatic hazard
Eye Dam.	Serious eye damage
Flam. Liq.	Flammable liquids
Repr.	Reproductive toxicity
STOT RE	Specific target organ toxicity - repeated exposure

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS -

Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW CHEMICAL COMPANY LIMITED urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
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