



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™ EA-9189 H Adhesive White

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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™ EA-9189 H Adhesive White

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 adhesives and sealants. 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

Reproductive toxicity - Category 1B - H360F

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: **DANGER**

Hazard statements

H360F May damage fertility.

Precautionary statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P501 Dispose of contents/ container to an approved waste disposal plant.

Contains Dimethyldimethoxysilane

2.3 Other hazards

This product contains no substances assessed to be PBT or vPvB at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Silicone, Sealant

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 Not available EC-No. Not available Index-No.	—	>= 4.8 - <= 6.0 %	Vinyltrimethoxysilan e modified Quartz	Carc. 1A; H350 STOT RE 1; H372 (Lungs)

—				Acute toxicity estimate Acute oral toxicity: > 5,000 mg/kg
CASRN 68909-20-6 EC-No. 272-697-1 Index-No. 014-052-00-7	—	>= 2.3 - <= 2.8 %	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 27858-32-8 EC-No. 248-697-2 Index-No. —	—	>= 0.8 - <= 1.6 %	Diisopropoxydi(ethoxyacetoacetyl)titana te	Flam. Liq. 3; H226 Eye Irrit. 2; H319 STOT SE 3; H336 (Central nervous system) Acute toxicity estimate Acute oral toxicity: 23,020 mg/kg Acute inhalation toxicity: > 198.65 mg/l, 4 Hour, vapour Acute dermal toxicity: 12,870 mg/kg
CASRN 1112-39-6 EC-No. 214-189-4 Index-No. —	—	>= 0.7 - <= 1.5 %	Dimethyldimethoxy silane	Flam. Liq. 2; H225 Repr. 1B; H360F Acute toxicity estimate Acute oral toxicity: > 2,000 - 5,000 mg/kg Acute inhalation toxicity: > 4.7 mg/l, 4 Hour, vapour
Substances with a workplace exposure limit				
CASRN Not available EC-No. Not available Index-No. —	—	>= 53.0 - <= 63.0 %	Vinyltrimethoxysilane treated aluminum hydroxide	Not classified Acute toxicity estimate Acute oral toxicity: > 2,000 mg/kg
CASRN 1185-55-3 EC-No.	—	>= 1.1 - <= 1.9 %	Methyltrimethoxysilane	Flam. Liq. 2; H225

214-685-0 Index-No. —				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
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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: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

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

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

May damage fertility.

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. Skin contact may aggravate preexisting dermatitis.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

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

Unsuitable extinguishing media: None known..

5.2 Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: Exposure to combustion products may be a hazard to health..

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..

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:

Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. 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: Wipe up or scrape up and contain for salvage or disposal. 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 contact with eyes. Do not swallow. Keep container tightly closed. Take care to prevent spills, waste and minimize release to the environment. 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. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

7.2 Conditions for safe storage, including any incompatibilities: Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.

Do not store with the following product types: Strong oxidizing agents. Organic peroxides. 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
Dimethyldimethoxysilane	Dow IHG	TWA	2.4 ppm
Vinyltrimethoxysilane treated aluminum hydroxide	ACGIH	TWA Respirable particulate matter	1 mg/m3 , Aluminium
	Further information: A4: Not classifiable as a human carcinogen		
	GB EH40	TWA inhalable dust	10 mg/m3
	GB EH40	TWA Respirable dust	4 mg/m3
Methyltrimethoxysilane	US WEEL	TWA	10 ppm
	US WEEL	STEL	55 mg/m3
	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.		
Isopropanol	ACGIH	TWA	200 ppm
	Further information: A4: Not classifiable as a human carcinogen		
	ACGIH	STEL	400 ppm
	Further information: A4: Not classifiable as a human carcinogen		
	GB EH40	TWA	999 mg/m3 400 ppm
	GB EH40	STEL	1,250 mg/m3 500 ppm

The following substance(s), which have Occupational Exposure Limit(s) (OEL), may be formed during handling or processing:

Methanol.

Isopropanol

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	15 mg/l	ACGIH

				shift (As soon as possible after exposure ceases)		BEI
Isopropanol	67-63-0	Acetone	Urine	End of shift at end of workweek	40 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 Sécurité, (INRS), France.

Derived No Effect Level

Diisopropoxydi(ethoxyacetoacetyl)titanate

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.	500 mg/m ³	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.	n.a.	n.a.	n.a.	n.a.	n.a.

Dimethyldimethoxysilane

Workers

Acute systemic effects	Acute local effects	Long-term systemic	Long-term local effects
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				effects			
Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
20 mg/kg bw/day	130 mg/m3	n.a.	130 mg/m3	2.8 mg/kg bw/day	19.7 mg/m3	n.a.	130 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
4 mg/kg bw/day	26 mg/m3	4 mg/kg bw/day	n.a.	26 mg/m3	1 mg/kg bw/day	3.5 mg/m3	1 mg/kg bw/day	n.a.	26 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.

methanol

Workers

Acute systemic effects			Acute local effects		Long-term systemic effects		Long-term local effects	
Dermal	Inhalation		Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
20 mg/kg bw/day	130 mg/m3		n.a.	130 mg/m3	20 mg/kg bw/day	130 mg/m3	n.a.	130 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
4 mg/kg bw/day	26 mg/m3	4 mg/kg bw/day	n.a.	26 mg/m3	4 mg/kg bw/day	26 mg/m3	4 mg/kg bw/day	n.a.	26 mg/m3

Isopropanol

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.	1000 mg/m3		n.a.	n.a.	888 mg/kg bw/day	500 mg/m3	n.a.	n.a.

Consumers

Acute systemic effects			Acute local effects		Long-term systemic effects			Long-term local	
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								<i>effects</i>	
Dermal	Inhalation	Oral	Dermal	Inhalation	Dermal	Inhalation	Oral	Dermal	Inhalation
n.a.	178 mg/m3	51 mg/kg bw/day	n.a.	n.a.	319 mg/kg bw/day	89 mg/m3	26 mg/kg bw/day	n.a.	n.a.

Predicted No Effect Concentration

Diisopropoxydi(ethoxyacetoacetyl)titanate

Compartment	PNEC
Fresh water	0.1 mg/l
Intermittent use/release	1.0 mg/l
Marine water	0.01 mg/l
Fresh water sediment	0.082 mg/kg dry weight (d.w.)
Marine sediment	0.008 mg/kg dry weight (d.w.)
Soil	0.019 mg/kg dry weight (d.w.)

Dimethyldimethoxysilane

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 safety glasses (with side shields). Safety glasses (with side shields) 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. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). 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	paste
Color	white
Odor	slight alcoholic
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)	Not applicable
Flash point	Not applicable
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	Not classified as a flammability hazard
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.6
Water solubility	insoluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available

Dynamic Viscosity	Not applicable
Kinematic Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.

9.2 Other information

Molecular weight No data available

Particle size 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.

10.4 Conditions to avoid: None known.

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. Isopropanol.

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**

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:

Vinyltrimethoxysilane modified Quartz

For similar material(s): LD50, Rat, > 5,000 mg/kg

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

LD50, Rat, male, 23,020 mg/kg OECD 401 or equivalent

Dimethyldimethoxysilane

LD50, Rat, > 2,000 - 5,000 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.

Vinyltrimethoxysilane treated aluminum hydroxide

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

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, > 5,000 mg/kg Estimated.

Information for components:

Vinyltrimethoxysilane modified Quartz

The dermal LD50 has not been determined.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s): LD50, Rabbit, 12,870 mg/kg

Dimethyldimethoxysilane

The dermal LD50 has not been determined.

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.

Vinyltrimethoxysilane treated aluminum hydroxide

The dermal LD50 has not been determined.

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 may cause respiratory irritation. Excessive exposure may cause: Central nervous system effects.

The LC50 has not been determined.

Information for components:

Vinyltrimethoxysilane modified Quartz

The LC50 has not been determined.

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

The LC50 has not been determined.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s): LC50, Rat, male and female, 4 Hour, vapour, > 198.65 mg/l
No deaths occurred at this concentration.

Dimethyldimethoxysilane

LC50, Rat, 4 Hour, vapour, > 4.7 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.

Vinyltrimethoxysilane treated aluminum hydroxide

The LC50 has not been determined.

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.
May cause drying and flaking of the skin.

Information for components:

Vinyltrimethoxysilane modified Quartz

Brief contact is essentially nonirritating to skin.
May cause drying and flaking of the skin.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s):
Brief contact is essentially nonirritating to skin.

Dimethyldimethoxysilane

Brief contact is essentially nonirritating to skin.

Vinyltrimethoxysilane treated aluminum hydroxide

Brief contact may cause slight skin irritation with local redness.

Methyltrimethoxysilane

Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

Information for the Product:

Based on information for component(s):

May cause slight temporary eye irritation.
May cause mild eye discomfort.

Information for components:**Vinyltrimethoxysilane modified Quartz**

Solid or dust may cause irritation or corneal injury due to mechanical action.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s):

May cause moderate eye irritation.

May cause slight corneal injury.

Dimethyldimethoxysilane

Essentially nonirritating to eyes.

Vinyltrimethoxysilane treated aluminum hydroxide

May cause slight temporary eye irritation.

Corneal injury is unlikely.

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:**Vinyltrimethoxysilane modified Quartz**

For skin sensitization:

No relevant data found.

For respiratory sensitization:

No relevant data found.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For skin sensitization:

For similar material(s):

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Dimethyldimethoxysilane

For skin sensitization:

For similar material(s):

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

For respiratory sensitization:

No relevant data found.

Vinyltrimethoxysilane treated aluminum hydroxide

For skin sensitization:

For similar material(s):

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

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:

Vinyltrimethoxysilane modified Quartz

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

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

May cause drowsiness or dizziness.

Route of Exposure: Inhalation

Target Organs: Central nervous system

Dimethyldimethoxysilane

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

Vinyltrimethoxysilane treated aluminum hydroxide

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:**Vinyltrimethoxysilane modified Quartz**

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

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

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

Diisopropoxydi(ethoxyacetoacetyl)titanate

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

Dimethyldimethoxysilane

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

Vinyltrimethoxysilane treated aluminum hydroxide

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:**Vinyltrimethoxysilane modified Quartz**

For similar material(s):

In humans, effects have been reported on the following organs:

Kidney.

Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.

Due to the physical state of the material, this component is not expected to be bioavailable under normal handling and processing conditions.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s):

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

Dimethyldimethoxysilane

In animals, effects have been reported on the following organs:

Liver

Male reproductive organs.

This material contains dimethyldimethoxysilane. Repeated exposure in rats to dimethyldimethoxysilane 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.

Vinyltrimethoxysilane treated aluminum hydroxide

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:

Vinyltrimethoxysilane modified Quartz

For similar material(s): Has caused cancer in humans. Has caused cancer in laboratory animals. Due to the physical state of the material, this component is not expected to be bioavailable under normal handling and processing conditions.

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

No relevant data found.

Diisopropoxydi(ethoxyacetoacetyl)titanate

No relevant data found.

Dimethyldimethoxysilane

No relevant data found.

Vinyltrimethoxysilane treated aluminum hydroxide

No relevant data found.

Methyltrimethoxysilane

No relevant data found.

Teratogenicity

May damage fertility.

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

For similar material(s): Did not cause birth defects or any other fetal effects in laboratory animals.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s): Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Dimethyldimethoxysilane

Has caused birth defects in laboratory animals.

Vinyltrimethoxysilane treated aluminum hydroxide

For similar material(s): 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

May damage fertility.

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

No relevant data found.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

No relevant data found.

Dimethyldimethoxysilane

In animal studies, has been shown to interfere with fertility.

Vinyltrimethoxysilane treated aluminum hydroxide

No relevant data found.

Methyltrimethoxysilane

In animal studies, did not interfere with reproduction.

Mutagenicity

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

For similar material(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases.

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

In vitro genetic toxicity studies were negative.

Dimethyldimethoxysilane

In vitro genetic toxicity studies were negative.

Vinyltrimethoxysilane treated aluminum hydroxide

No relevant data found.

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

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

Acute toxicity to fish

No relevant data found.

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

Diisopropoxydi(ethoxyacetoacetyl)titanate

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, Rasbora heteromorpha (Harlequin fish), static test, 96 Hour, 4,200 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, > 100 mg/l, OECD Test Guideline 201 or Equivalent

NOEC, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, 100 mg/l, OECD Test Guideline 201 or Equivalent

Dimethyldimethoxysilane

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 data from similar materials
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 126 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, > 119 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

Based on data from similar materials
EC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, > 118 mg/l, OECD Test Guideline 201

Toxicity to bacteria

Based on data from similar materials
EC50, 3 Hour, > 100 mg/l, OECD Test Guideline 209

Vinyltrimethoxysilane treated aluminum hydroxide

Acute toxicity to fish

No relevant data found.

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), flow-through, 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), Static, 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), Static, 72 Hour, Growth rate inhibition, >= 3.6 mg/l, OECD Test Guideline 201

Toxicity to bacteria

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

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, >= 10 mg/l

12.2 Persistence and degradability

Information for the Product:

Product test data not available.

Information for components:**Vinyltrimethoxysilane modified Quartz****Biodegradability:** No relevant data found.**silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica****Biodegradability:** Biodegradation is not applicable.**Diisopropoxydi(ethoxyacetoacetyl)titanate****Biodegradability:** For similar material(s): Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 66 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301D**Dimethyldimethoxysilane****Biodegradability:** For similar material(s): Material is not readily biodegradable according to OECD/EEC guidelines.

10-day Window: Fail

Biodegradation: 0 %**Exposure time:** 28 d**Stability in Water (1/2-life)**

Hydrolysis, DT50, < 0.6 Hour, pH 7

Vinyltrimethoxysilane treated aluminum hydroxide**Biodegradability:** No relevant data found.**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****Information for the Product:**

Product test data not available.

Information for components:**Vinyltrimethoxysilane modified Quartz****Bioaccumulation:** No relevant data found.**silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica****Bioaccumulation:** No relevant data found.**Diisopropoxydi(ethoxyacetoacetyl)titanate**

Bioaccumulation: For similar material(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 0.05

Bioconcentration factor (BCF): 3 Fish Estimated.

Dimethyldimethoxysilane

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): Pow: 2 estimated

Bioconcentration factor (BCF): 3.16 Estimated.

Vinyltrimethoxysilane treated aluminum hydroxide

Bioaccumulation: No relevant data found.

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

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

No relevant data found.

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

No relevant data found.

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s):

Partition coefficient (Koc): 1.53 Estimated.

Dimethyldimethoxysilane

Partition coefficient (Koc): 168.6 Estimated.

Vinyltrimethoxysilane treated aluminum hydroxide

No relevant data found.

Methyltrimethoxysilane

No relevant data found.

12.5 Results of PBT and vPvB assessment

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

No data available

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

Substance is not persistent, bioaccumulative, and toxic (PBT). Not very persistent and very bioaccumulative (vPvB).

Diisopropoxydi(ethoxyacetoacetyl)titanate

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).

Dimethyldimethoxysilane

Substance is not persistent, bioaccumulative, and toxic (PBT). Not very persistent and very bioaccumulative (vPvB).

Vinyltrimethoxysilane treated aluminum hydroxide

No data available

Methyltrimethoxysilane

Substance is not persistent, bioaccumulative, and toxic (PBT). Not very persistent and very bioaccumulative (vPvB).

12.6 Other adverse effects

Information for the Product:

Product test data not available.

Information for components:

Vinyltrimethoxysilane modified Quartz

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

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.

Diisopropoxydi(ethoxyacetoacetyl)titanate

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

Dimethyldimethoxysilane

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

Vinyltrimethoxysilane treated aluminum hydroxide

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 EC Directive 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 | Not applicable |
| 14.2 | UN proper shipping name | Not regulated for transport |
| 14.3 | Transport hazard class(es) | Not applicable |
| 14.4 | Packing group | Not applicable |
| 14.5 | Environmental hazards | Not considered environmentally hazardous based on available data. |
| 14.6 | Special precautions for user | No data available. |

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 | Not applicable |
| 14.2 | UN proper shipping name | Not regulated for transport |
| 14.3 | Transport hazard class(es) | Not applicable |
| 14.4 | Packing group | Not applicable |
| 14.5 | Environmental hazards | Not considered as marine pollutant based on available data. |
| 14.6 | Special precautions for user | No data available. |
| 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 | Not applicable |
| 14.2 | UN proper shipping name | Not regulated for transport |
| 14.3 | Transport hazard class(es) | Not applicable |

- 14.4 Packing group** Not applicable
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). 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.

Control of Major Accident Hazards Regulations 2015 (COMAH)

Listed in Regulation: Not applicable

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.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H350	May cause cancer.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

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

Repr. - 1B - H360F - Calculation method

Revision

Identification Number: 4103950 / A279 / Issue Date: 18.11.2025 / Version: 9.0

In case this version of the SDS contains significant changes from the previous version, they are listed below or noted by bold, double bars in the left-hand margin throughout this document.

Changes encompass identification, hazards, tox/eco-tox information and the addition/removal of the ingredients, and regulatory information, hazard information, uses, risk management measures and other key regulatory changes of the product. Detailed explanation of the changes can be obtained upon request.

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)
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
Repr.	Reproductive toxicity
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADN R - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways on the Rhine; ADR - European 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; CASRN - Chemical Abstracts Service Registry Number; 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; Index-No. - Index Number (CLP Annex VI); 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); LOAEC - Lowest Observed Adverse Effect Concentration; LOEC - Lowest Observed Effect Concentration; 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; 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.

GB