Material Safety Data Sheet

DOW CHEMICAL KOREA LIMITED

Product name: DOWSIL™ 3-1944HP RTV Coating

Issue Date: 2020.10.07
Print Date: 2020.10.08

DOW CHEMICAL KOREA 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.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: DOWSIL™ 3-1944HP RTV Coating

Recommended use of the chemical and restrictions on use
Identified uses: Corrosion inhibitors Electrical industry and electronics Adhesive, binding agents
Uses advised against: We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION
DOW CHEMICAL KOREA LIMITED
520, YEONGDONG-DAERO, GANGNAM-GU
5TH FLOOR, I-PARK TOWER
SEOUL TEUGBYEOLSI 06170
SOUTH KOREA

Customer Information Number: 82-(0)2-3490-0700
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 080-369-2436
Local Emergency Contact: 080-369-2436

2. HAZARDS IDENTIFICATION

GHS Classification
Skin sensitisation : Category 1

GHS label elements
Hazard pictograms :

Signal word : Warning
Hazard statements : H317 May cause an allergic skin reaction.

Precautionary statements : **Prevention:**

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment (see supplemental first aid instructions on this label).
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
Disposal:
P501 Dispose of contents and container according to wastes control act.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	Common Name	CASRN	Concentration	Identification Number
Methyltrichlorosilane treated Silica	No data available	121375-93-7	>= 1.0 - <= 8.0 %	해당없음(N/A)
Dimethyl siloxane, trimethoxysilyl-terminated	No data available	Not available	>= 78.0 - <= 88.0 %	97-3-844
Methyltrimethoxysilane	No data available	1185-55-3	>= 1.0 - <= 5.0 %	KE-34364
Dimethyl Siloxane, Dimethylvinylsiloxy-terminated	No data available	68083-19-2	>= 7.0 - <= 17.0 %	KE-31212
Diisopropoxydi(ethoxyacetoacetyl)titanate	No data available	27858-32-8	>= 0.5 - <= 3.5 %	KE-03148
Methanol	methyl alcohol	67-56-1	>= 0.03 - <= 0.16 %	97-1-80 KE-23193

4. FIRST AID MEASURES

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. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation or rash occurs. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

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: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

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

5. FIREFIGHTING MEASURES

Extinguishing media

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

Unsuitable extinguishing media: None known..

Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: Exposure to combustion products may be a hazard to health.. Applying foam initially will release significant amounts of corrosive hydrogen chloride vapors which will be reduced when uniform blanketing is achieved..

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.. Suppress (knock down) gases/vapours/mists with a water spray jet..
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..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions: Discharge into the environment must be avoided. 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.

Methods and materials for containment and cleaning up: Soak up with inert absorbent material. Clean up remaining materials from spill with suitable absorbant. knock down the corrosive vapor cloud downwind of the spill area. Flammable hydrogen gas may also be generated and trapped under the foam blanket. 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.
See sections: 7, 8, 11, 12 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Do not get on skin or clothing. Avoid inhalation of vapour or mist. Avoid contact with eyes. Do not swallow. Keep away from water. Protect from moisture. 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 only with adequate ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Conditions for safe storage: Keep in properly labelled containers. Store in accordance with the particular national regulations. In general chlorosilanes containing Silicon-Hydride (SiH) must be stored in pressurized packaging but some exceptions do exist. In any case the material should not be repacked without guidance from Dow Corning's packaging experts. Store in a closed container.

Do not store with the following product types: Strong oxidizing agents.
Unsuitable materials for containers**:** None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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
Methyltrichlorosilane treated Silica	Dow IHG	TWA Respirable dust	2 mg/m3
	Dow IHG	TWA Total dust	6 mg/m3
	KR OEL	TWA	10 mg/m3
Methyltrimethoxysilane	Dow IHG	TWA	7.5 ppm
	Further information: Skin Sensitizer		
Methanol	ACGIH	TWA	200 ppm
	Further information: Skin: Danger of cutaneous absorption		
	ACGIH	STEL	250 ppm
	Further information: Skin: Danger of cutaneous absorption		
	KR OEL	TWA	200 ppm
	Further information: Skin: Substances designated by 'Skin' may be absorbed into the bloodstream through the skin, mucous membrane and eye and contribute to the overall effect. (Skin notation does not apply to the skin irritant)		
	KR OEL	STEL	250 ppm
	Further information: Skin: Substances designated by 'Skin' may be absorbed into the bloodstream through the skin, mucous membrane and eye and contribute to the overall effect. (Skin notation does not apply to the skin irritant)		
	KR PEL	TWA	200 ppm
	Further information: Skin: Substances designated by 'Skin' may be absorbed into the bloodstream through the skin, mucous membrane and eye and contribute to the overall effect. (Skin notation does not apply to the skin irritant)		
	KR PEL	STEL	250 ppm
	Further information: Skin: Substances designated by 'Skin' may be absorbed into the bloodstream through the skin, mucous membrane and eye and contribute to the overall effect. (Skin notation does not apply to the skin irritant)		
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		
	KR OEL	TWA	200 ppm
	KR OEL	STEL	400 ppm

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

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
Isopropanol	67-63-0	Acetone	Urine	End of shift at	40 mg/l	ACGIH BEI

	end of workweek

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.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Examples of acceptable glove barrier materials include: Natural rubber ("latex"). 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	viscous liquid
Color	Straw-coloured
Odor	alcohol-like
Odor Threshold	No data available
pH	No data available
Melting point/range	No data available
Freezing point	No data available
Boiling point (760 mmHg)	> 100 °C
Flash point	**closed cup** 99 °C **Cleveland open cup** 117 °C
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not applicable
Flammability (liquids)	Not applicable

Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.0
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Dynamic Viscosity	50,000 mPa.s
Kinematic Viscosity	No data available
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.
Molecular weight	No data available
Particle size	Not applicable

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

10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: Can react with strong oxidizing agents. Vapours may form explosive mixture with air. Hazardous decomposition products will be formed at elevated temperatures.

Conditions to avoid: None known.

Incompatible materials: Water Oxidizing agents

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

11. TOXICOLOGICAL INFORMATION

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

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 oral toxicity

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:

Methyltrichlorosilane treated Silica
Based on data from similar materials LD50, Rat, > 5,000 mg/kg

Dimethyl siloxane, trimethoxysilyl-terminated

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

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Based on testing for product(s) in this family of materials: LD50, Rat, > 5,000 mg/kg

Diisopropoxydi(ethoxyacetoacetyl)titanate
LD50, Rat, male, 23,020 mg/kg OECD 401 or equivalent

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. Effects may be delayed. LD50, Rat, > 5,000 mg/kg

Lethal Dose, Humans, 340 mg/kg Estimated.

Lethal Dose, Humans, 29 - 237 ml Estimated.

Acute dermal toxicity
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, > 2,000 mg/kg Estimated.

Information for components:

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

Dimethyl siloxane, trimethoxysilyl-terminated

For similar material(s): LD50, Rat, > 2,000 mg/kg Estimated.

Methyltrimethoxysilane

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Based on testing for product(s) in this family of materials: 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

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. LD50, Rabbit, 15,800 mg/kg

Acute inhalation toxicity
Brief exposure (minutes) is not likely to cause adverse effects. Excessive exposure may cause: Central nervous system effects. May cause dizziness and drowsiness. Vapor from heated material may cause respiratory irritation.

As product: The LC50 has not been determined.

Information for components:

Methyltrichlorosilane treated Silica
For similar material(s): LC50, Rat, 4 Hour, dust/mist, > 0.477 mg/l

Dimethyl siloxane, trimethoxysilyl-terminated

The LC50 has not been determined.

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
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.

Methanol
Easily attainable vapor concentrations may cause serious adverse effects, even death. At lower concentrations: May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death. Effects may be delayed.

LC50, Rat, 4 Hour, vapour, 3 mg/l

Skin corrosion/irritation
Based on information for component(s):
Brief contact is essentially nonirritating to skin.

Information for components:

Methyltrichlorosilane treated Silica
Brief contact is essentially nonirritating to skin.
May cause skin irritation due to mechanical abrasion.

Dimethyl siloxane, trimethoxysilyl-terminated

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

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Based on testing for product(s) in this family of materials:
Brief contact is essentially nonirritating to skin.

Diisopropoxydi(ethoxyacetoacetyl)titanate
Brief contact is essentially nonirritating to skin.

Methanol
Prolonged contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation
Based on information for component(s):
May cause slight eye irritation.
May cause corneal injury.

Information for components:

Methyltrichlorosilane treated Silica
Essentially nonirritating to eyes.
Solid or dust may cause irritation or corneal injury due to mechanical action.

Dimethyl siloxane, trimethoxysilyl-terminated

For similar material(s):
May cause slight temporary eye irritation.
Corneal injury is unlikely.

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Based on testing for product(s) in this family of materials:
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Diisopropoxydi(ethoxyacetoacetyl)titanate
May cause moderate eye irritation.
May cause corneal injury.

Methanol
May cause eye irritation.

Skin and Respiratory Sensitization
For skin sensitization:
Contains component(s) which have caused allergic skin sensitization in guinea pigs.

For respiratory sensitization:
No relevant data found.

Information for components:

Methyltrichlorosilane treated Silica
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Dimethyl siloxane, trimethoxysilyl-terminated

For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Methyltrimethoxysilane
For skin sensitization:
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
For skin sensitization:
Based on testing for product(s) in this family of materials:
Did not cause allergic skin reactions when tested in humans.
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Diisopropoxydi(ethoxyacetoacetyl)titanate
For similar material(s):
Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Methanol
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Information for components:

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

Dimethyl siloxane, trimethoxysilyl-terminated

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.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Available data are inadequate to determine single exposure specific target organ toxicity.

Diisopropoxydi(ethoxyacetoacetyl)titanate
May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Central nervous system

Methanol
Causes damage to organs.
Route of Exposure: Oral
Target Organs: Eyes, Central nervous system

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

Information for components:

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

Dimethyl siloxane, trimethoxysilyl-terminated

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

Methyltrimethoxysilane
May be harmful if swallowed and enters airways.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
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.

Methanol
May be harmful if swallowed and enters airways.

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)
Contains a component(s) that is/are not expected to be bioavailable due to the physical state of the material under normal handling and processing conditions.

Information for components:

Methyltrichlorosilane treated Silica
For similar material(s):
In animals, effects have been reported on the following organs:
Liver
These effects were only observed at exaggerated doses.
Due to the physical state of the material, this component is not expected to be bioavailable under normal handling and processing conditions.

Dimethyl siloxane, trimethoxysilyl-terminated

No relevant data found.

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
No relevant data found.

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

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.

Carcinogenicity
No relevant data found.

Information for components:

Methyltrichlorosilane treated Silica
For similar material(s): Did not cause cancer in laboratory animals.

Dimethyl siloxane, trimethoxysilyl-terminated

No relevant data found.

Methyltrimethoxysilane

No relevant data found.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
No relevant data found.

Diisopropoxydi(ethoxyacetoacetyl)titanate
No relevant data found.

Methanol
Did not cause cancer in laboratory animals.

Teratogenicity
No relevant data found.

Information for components:

Methyltrichlorosilane treated Silica
No relevant data found.

Dimethyl siloxane, trimethoxysilyl-terminated

No relevant data found.

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
No relevant data found.

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.

Methanol
Methanol has caused birth defects in mice at doses nontoxic to the mother as well as slight behavioral effects in offspring of rats.

Reproductive toxicity
No relevant data found.

Information for components:

Methyltrichlorosilane treated Silica
For similar material(s): In animal studies, did not interfere with reproduction.

Dimethyl siloxane, trimethoxysilyl-terminated

No relevant data found.

Methyltrimethoxysilane
In animal studies, did not interfere with reproduction.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
No relevant data found.

Diisopropoxydi(ethoxyacetoacetyl)titanate
No relevant data found.

Methanol
In animal studies, did not interfere with reproduction.

Mutagenicity
Contains component(s) which were negative in some in vitro genetic toxicity studies and positive in others. Genetic toxicity studies in animals were negative for component(s) tested.

Information for components:

Methyltrichlorosilane treated Silica
For similar material(s): In vitro genetic toxicity studies were negative.

Dimethyl siloxane, trimethoxysilyl-terminated

In vitro 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.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Based on testing for product(s) in this family of materials: In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Diisopropoxydi(ethoxyacetoacetyl)titanate
In vitro genetic toxicity studies were negative.

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

12. ECOLOGICAL INFORMATION

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

Ecotoxicity

Methyltrichlorosilane treated Silica

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
For similar material(s):
LC50, zebra fish (Brachydanio rerio), 96 Hour, > 1,000 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
For similar material(s):
EC50, Daphnia magna (Water flea), 24 Hour, > 1,000 mg/l, OECD Test Guideline 202

Dimethyl siloxane, trimethoxysilyl-terminated

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
For similar material(s):
LC50, Fish, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates
For similar material(s):
EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l

Acute toxicity to algae/aquatic plants
For similar material(s):
EC50, algae, 14 d, > 2,000 mg/l

Chronic toxicity to fish
For similar material(s):
No toxicity at the limit of solubility
NOEC, Cyprinodon variegatus (sheepshead minnow), 33 d, 91 mg/l

Chronic toxicity to aquatic invertebrates
For similar material(s):
No toxicity at the limit of solubility

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
Based on information for a similar material:
oral LD50, Colinus virginianus (Bobwhite quail), > 5,000 mg/kg

Methyltrimethoxysilane

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
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
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 3.6 mg/l, OECD Test Guideline 201
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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
For similar material(s):
LC50, Fish, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates
For similar material(s):
EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l

Acute toxicity to algae/aquatic plants
For similar material(s):
EC50, algae, 14 d, > 2,000 mg/l

Chronic toxicity to fish
For similar material(s):
NOEC, Cyprinodon variegatus (sheepshead minnow), 33 d, 91 mg/l

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
Based on information for a similar material:
oral LD50, Colinus virginianus (Bobwhite quail), > 5,000 mg/kg

Diisopropoxydi(ethoxyacetoacetyl)titanate

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
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

Methanol

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Bluegill sunfish (Lepomis macrochirus), flow-through test, 96 Hour, 15,400 mg/l

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), 48 Hour, > 10,000 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate, 22,000 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
IC50, activated sludge, 3 Hour, Respiration rates., > 1,000 mg/l, OECD Test Guideline 209

Chronic toxicity to fish
NOEC, Oryzias latipes (Orange-red killifish), 200 Hour, 15,800 mg/l

Persistence and degradability

Methyltrichlorosilane treated Silica
Biodegradability: Biodegradation is not applicable.

Dimethyl siloxane, trimethoxysilyl-terminated

Biodegradability: The product is not biodegradable.

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated
Biodegradability: No appreciable biodegradation is expected.

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

Methanol
Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Chemical Oxygen Demand: 1.49 mg/mg Dichromate

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	72 %
20 d	79 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 - 18 d
Method: Estimated.

Bioaccumulative potential

Methyltrichlorosilane treated Silica

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Dimethyl siloxane, trimethoxysilyl-terminated

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Methyltrimethoxysilane

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

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

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.

Methanol

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.77 Measured
Bioconcentration factor (BCF): < 10 Leuciscus idus (Golden orfe) Measured

Mobility in Soil

Methyltrichlorosilane treated Silica

No relevant data found.

Dimethyl siloxane, trimethoxysilyl-terminated

Expected to be relatively immobile in soil (Koc > 5000).

Methyltrimethoxysilane

No relevant data found.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated

Expected to be relatively immobile in soil (Koc > 5000).

Diisopropoxydi(ethoxyacetoacetyl)titanate

For similar material(s):
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 1.53 Estimated.

Methanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 0.44 Estimated.

Results of PBT and vPvB assessment

Methyltrichlorosilane treated Silica

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Dimethyl siloxane, trimethoxysilyl-terminated

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

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).

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

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).

Methanol

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).

Other adverse effects

Methyltrichlorosilane treated Silica

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

Dimethyl siloxane, trimethoxysilyl-terminated

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.

Dimethyl Siloxane, Dimethylvinylsiloxy-terminated

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.

Methanol

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

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS

INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section10 Regulatory Information, MSDS Section 15

Disposal precautions: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

Contaminated packaging: All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.

14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport:

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
Environmental hazards	Not applicable
Special precautions for user	No data available.

Classification for SEA transport (IMO-IMDG):

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
Marine pollutant	Not applicable
Special precautions for user	No data available.
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
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.

15. REGULATORY INFORMATION

Regulation under the Occupational Safety and Health Act
The product is classified as hazardous by OSHA in Korea.

Harmful Substances Prohibited from Manufacturing

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Harmful Agents to be kept below Occupational Exposure Limits

Components	CASRN
Methyltrichlorosilane treated Silica	121375-93-7
Methanol	67-56-1

Harmful Agents Required to be kept below Permission Levels

Components	CASRN
Methanol	67-56-1

Hazardous substances requiring management

Not applicable

Special Management Materials

Not applicable

Controlled Substances Subject to Environment Monitoring

Not applicable

Controlled Substances Subject to Health Examination

Not applicable

Regulation under the Chemical Control Act

Toxic Chemicals

Not applicable

Restricted Chemicals

Not applicable

Prohibited Chemicals

Not applicable

Accident Precaution Chemicals

Not applicable

Dangerous Substances Safety Management Act

Classification	Group 4, Flammable liquids, Type 3 petroleums, Water insoluble liquid

Hazard rank	Hazardous rank III
Designated Quantity	2000 litre
Safety Warning	Keep away from fire

Waste Management Law
Industrial waste
Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries
Korea. Korean Existing Chemicals Inventory (KECI):
All intentional components are listed on the inventory, are exempt, or are supplier certified.

The company that sold this product to the consumer could be subject to legal liability, including criminal sanctions for violation of K-BPR.

16. OTHER INFORMATION

Other information
none

Hazard Rating System
NFPA

Health	Flammability	Instability
2	1	0

Revision
Identification Number: 4085928 / A153 / Issue Date: 2020.10.07 / Version: 10.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.
Date of first issue: 2015.07.08

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
Dow IHG	Dow Industrial Hygiene Guideline
KR OEL	Harmful Agents to be kept below Occupational Exposure Limits
KR PEL	Harmful Agents Required to be kept below Permission Levels
STEL	Short-term exposure limit
TWA	Time weighted average

Full text of other abbreviations
AICS - Australian Inventory of Chemical Substances; AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; 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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 KOREA 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.
KR