# SAFETY DATA SHEET
**DOW CHEMICAL TAIWAN LIMITED**

**Product name: DOWSIL™ 340 Heat Sink Compound**

**Issue Date:** 2023.12.29
**Print Date:** 2024.11.27

DOW CHEMICAL TAIWAN 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™ 340 Heat Sink Compound

**Other names:** None

**Recommended use of the chemical and restrictions on use**
**Identified uses:** Heat transfer agents

**COMPANY IDENTIFICATION**
DOW CHEMICAL TAIWAN LIMITED
5F-2 AND 5F-3, NO. 2, SEC. 3
MINSHENG E. ROAD, ZHONGSHAN DIST.
104 TAIPEI CITY
TAIWAN

**Customer Information Number:** (02) 2775-6100
SDSQuestion@dow.com

**EMERGENCY TELEPHONE NUMBER**
**24-Hour Emergency Contact:** 02-27756292
**Local Emergency Contact:** 02-27756292

## 2. HAZARDS IDENTIFICATION

**GHS Classification**
Short-term (acute) aquatic hazard - Category 1
Long-term (chronic) aquatic hazard - Category 1

**GHS label elements**
**Hazard pictograms**

Signal word: **WARNING!**

**Hazard statements**
Very toxic to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention**
Avoid release to the environment.

**Response**
Collect spillage.

**Disposal**
Dispose of contents and/or container to an approved waste disposal plant.

**Other hazards**
No data available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical Properties:** Silicone compound
This product is a mixture.

| Component | CASRN | Concentration |
|---|---|---|
| Zinc oxide | 1314-13-2 | >= 59.0 - <= 79.0 % |

## 4. FIRST AID MEASURES

**Description of first aid measures**
**General advice:**
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.

**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:** If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

**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.

**Protection of first-aiders**
**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.

## 5. FIREFIGHTING MEASURES

**Extinguishing media**

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

**Unsuitable extinguishing media:** None known..

**Special hazards arising from the substance or mixture**

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

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

**Advice for firefighters**

**Fire Fighting Procedures:** Use water spray to cool unopened containers.. Evacuate area.. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage..
Use 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:** Wear self-contained breathing apparatus for firefighting if necessary.. Use personal protective equipment..

## 6. ACCIDENTAL RELEASE MEASURES

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

**Environmental precautions:** Do not release the product to the aquatic environment above defined regulatory levels Prevent further leakage or spillage if safe to do so. 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:** 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.
See sections: 7, 8, 11, 12 and 13.

## 7. HANDLING AND STORAGE

**Precautions for safe handling:** 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.

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 |
|---|---|---|---|
| Zinc oxide | ACGIH | TWA Respirable particulate matter | 2 mg/m3 |
| | ACGIH | STEL Respirable particulate matter | 10 mg/m3 |
| | TW OEL | TWA Fumes | 5 mg/m3 |
| | TW OEL | STEL Fumes | 10 mg/m3 |

Any type of listing among TWA, STEL, Ceiling and BEI which is missing from above Control parameters table, can be considered as no data available.

**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).

**Skin protection**

**Hand protection:** Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. 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"). 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:** Wear clean, body-covering clothing.

**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, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge.

**Hygiene measures: No smoking and drinking**

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | |
| **Physical state** | paste |
| **Color** | white |
| **Odor** | none |
| **Odor Threshold** | No data available |
| **pH** | Not applicable |
| **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)** | 2.0 |
| **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** | Not applicable |
| **Kinematic Viscosity** | Not applicable |
| **Explosive properties** | Not explosive |
| **Oxidizing properties** | The substance or mixture is not classified as oxidizing. |
| **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.

## 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.

**Conditions to avoid:** None known.

**Inhibitor:** None

**Incompatible materials:** Avoid contact with oxidizing materials.

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

## 11. TOXICOLOGICAL INFORMATION

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

**Exposure routes**
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:**
Not classified based on available information.

**Acute oral toxicity**

**Information for the Product:**

Very low toxicity if swallowed. Swallowing may result in gastrointestinal irritation. May cause nausea and vomiting.

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:**

**Zinc oxide**
LD50, Rat, male and female, > 5,000 mg/kg OECD 401 or equivalent

**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:**

**Zinc oxide**
LD50, Rat, male and female, > 2,000 mg/kg OECD 402 or equivalent No deaths occurred at this concentration.

**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.

As product: The LC50 has not been determined.

**Information for components:**

**Zinc oxide**
LC50, Rat, male and female, 4 Hour, dust/mist, > 5.7 mg/l OECD Test Guideline 403 No deaths occurred at this concentration.

**Skin corrosion/irritation**

Not classified based on available information.

**Information for the Product:**

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

**Information for components:**

**Zinc oxide**
Prolonged contact is essentially nonirritating to skin.

**Serious eye damage/eye irritation**

Not classified based on available information.

**Information for the Product:**

Based on information for component(s):
May cause slight temporary eye irritation.
Corneal injury is unlikely.
May cause mild eye discomfort.

**Information for components:**

**Zinc oxide**
May cause slight temporary eye irritation.
Corneal injury is unlikely.

**Sensitization**

**For skin sensitization:**
Not classified based on available information.

**For respiratory sensitization:**
Not classified based on available information.

**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:**

**Zinc oxide**
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.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
Available data are inadequate to determine single exposure specific target organ toxicity.

**Aspiration Hazard**

Not classified based on available information.

**Information for the Product:**

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

**Information for components:**

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

**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)**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
In humans, effects have been reported on the following organs:
Respiratory tract.
In animals, effects have been reported on the following organs:
Lung.

**Carcinogenicity**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
No relevant data found.

**Teratogenicity**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
No relevant data found.

**Reproductive toxicity**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

**Mutagenicity**

Not classified based on available information.

**Information for the Product:**

Product test data not available.

**Information for components:**

**Zinc oxide**
In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were predominantly negative.

## 12. ECOLOGICAL INFORMATION

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

**Ecotoxicity**

**Zinc oxide**

**Acute toxicity to fish**
Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 0.14 - 1.1 mg/l
LC50, Danio rerio (zebra fish), 96 Hour, 1 - 10 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), 48 Hour, 1 - 10 mg/l

**Acute toxicity to algae/aquatic plants**
IC50, Selenastrum capricornutum (green algae), 72 Hour, Growth rate, 0.136 mg/l
NOEC, Selenastrum capricornutum (green algae), 72 Hour, Growth rate, 0.019 mg/l

**Toxicity to bacteria**
EC50, activated sludge, 3 Hour, Respiration rates., 0.1 mg/l

**Chronic toxicity to fish**
NOEC, Danio rerio (zebra fish), 32 d, mortality, >= 0.540 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 0.04 mg/l

**Persistence and degradability**

**Zinc oxide**

**Biodegradability:** Biodegradability is not applicable to inorganic substances.

**Bioaccumulative potential**

**Zinc oxide**

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

**Mobility in soil**

**Zinc oxide**

No relevant data found.

**Results of PBT and vPvB assessment**

**Zinc oxide**

PBT assessment does not apply

**Other adverse effects**

**Zinc oxide**

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 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 SDS SECTION 1: Identified Uses. 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 Section 10 Regulatory Information, MSDS Section 15

**Treatment and disposal methods of used packaging:** 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 of the waste generator. Do not re-use containers for any purpose.

## 14. TRANSPORT INFORMATION

**Classification for ROAD and Rail transport:**

| | |
|---|---|
| **Proper shipping name** | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Zinc oxide) |

| | |
|---|---|
| **UN number** | UN 3077 |
| **Class** | 9 |
| **Packing group** | III |
| **Marine pollutant** | Yes |

**Classification for SEA transport (IMO-IMDG):**

| | |
|---|---|
| **Proper shipping name** | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Zinc oxide) |
| **UN number** | UN 3077 |
| **Class** | 9 |
| **Packing group** | III |
| **Marine pollutant** | Zinc oxide |
| **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):**

| | |
|---|---|
| **Proper shipping name** | Environmentally hazardous substance, solid, n.o.s.(Zinc oxide) |
| **UN number** | UN 3077 |
| **Class** | 9 |
| **Packing group** | III |

**Specific transport measures and precautionary conditions: No**

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

**Taiwan Chemical Substance Inventory (TCSI)**
All intentional components are either listed on the Inventory or exempted by regulations, or certified by vendors of their supply chemicals.

**Applicable regulations in Taiwan:**

**Occupation Safety and Health Law**

**Waste Disposal Act.**

**Rules on Road Traffic Safety**

**Standards of Permissible Exposure Limits in Workplace**

## 16. OTHER INFORMATION

**Revision**
Identification Number: 1608410 / A169 / Issue Date: 2023.12.29 / Version: 6.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

| | |
|---|---|
| ACGIH | USA. ACGIH Threshold Limit Values (TLV) |
| STEL | time weighted average for short term exposure |
| TW OEL | Standards of Permissible Exposure Limits in Workplace |
| TWA | 8-hour time weighted average |

**Full text of other abbreviations**
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; TECI - Thailand Existing Chemicals Inventory; 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 in Taiwan by the Product Regulatory Management group from information supplied by our parent company.

**Date that the SDS was prepared: Please refer to issue date.**

| | | |
|---|---|---|
| Organization that prepared the SDS | Company Name: Dow Chemical Taiwan Ltd | |
| | Address/Telephone: 1.CHUNG-HSIN 1ST STREET, MIN-HSIUNG INDUSTRIAL PARK,MIN-HSIUNG, CHIA-YI HSIEN ,TAIWAN / 886-5-2918446 / ytsai@dow.com | |
| Prepared by | Title: Product Regulatory Specialist | Name: Y.P. Tsai |

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