SAFETY DATA SHEET
THE DOW CHEMICAL COMPANY

Product name: DOWCAL™ 200 Heat Transfer Fluid

THE DOW CHEMICAL COMPANY 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. IDENTIFICATION

Product name: DOWCAL™ 200 Heat Transfer Fluid

Recommended use of the chemical and restrictions on use
Identified uses: Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the stated use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2030 WILLARD H DOW CENTER
MIDLAND MI  48674-0000
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards
no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Mixture
This product is a mixture.

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>Concentration</th>
</tr>
</thead>
</table>
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; if effects occur, 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: 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: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Do not store in: Opened or unlabeled containers. Store in a dry place. Avoid moisture. Store away from direct sunlight. Store in tightly closed container. Use only with adequate ventilation. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

Storage stability
Shelf life: Use within 60 Month

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value/Notation</th>
</tr>
</thead>
</table>


Propylene glycol | US WEEL | TWA | 10 mg/m³

**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). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

**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"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Polyvinyl alcohol ("PVA"). 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. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**

| Physical state | Liquid. |
| Color | Color is variable |
| Odor | Characteristic |
| Odor Threshold | No test data available |
| pH | 7.2 - 8.2  50% Literature |
| Melting point/range | Not applicable to liquids |
| Freezing point | -51 - -12 °C (-60 - -10 °F) Literature |
| Boiling point (760 mmHg) | 170 °C (338 °F) Literature |
| Flash point | closed cup 101 °C (214 °F) at 760 mmHg Literature |
| Evaporation Rate (Butyl Acetate = 1) | <0.5 Estimated. |
| Flammability (solid, gas) | Not applicable to liquids |
| Lower explosion limit | 2.6 % vol Literature (based on major component) |
| Upper explosion limit | 12.5 % vol Literature (based on major component) |
Vapor Pressure 3 mbar *Literature*
Relative Vapor Density (air = 1) >1.0 *Literature*
Relative Density (water = 1) 1.045 - 1.055 at 20 °C (68 °F) / 20 °C *Literature*
Water solubility Miscible in all proportions
Partition coefficient: n-octanol/water no data available
Auto-ignition temperature 420 °C (788 °F) *Literature* Propylene glycol.
Decomposition temperature No test data available
Kinematic Viscosity 50 - 75 mm²/s at 20 °C (68 °F) *Literature*
Explosive properties no data available
Oxidizing properties no data available
Molecular weight No test data available

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

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Avoid direct sunlight or ultraviolet sources.


Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers. Organic acids.

11. TOXICOLOGICAL INFORMATION

*Toxicological information on this product or its components appear in this section when such data is available.*

Acute toxicity

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.

For the major component(s):
LD₅₀, Rat, > 20,000 mg/kg
Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product: The dermal LD50 has not been determined.

For the major component(s):
LD50, Rabbit, > 20,000 mg/kg

Acute inhalation toxicity
Vapors are primarily water; single exposure is not likely to be hazardous. Mist may cause
irritation of upper respiratory tract (nose and throat).

As product: The LC50 has not been determined.

For the major component(s):
LC50, Rat, 4 Hour, vapour, 6.15 mg/l No deaths occurred following exposure to a saturated
atmosphere.

Skin corrosion/irritation
Prolonged contact is essentially nonirritating to skin. Repeated contact may cause flaking and softening of skin.

Serious eye damage/eye irritation
May cause slight temporary eye irritation. Corneal injury is unlikely. Mist may cause eye irritation.

Sensitization
For the major component(s):
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system
effects. For the minor component(s):
In animals, effects have been reported on the following organs:
Liver.
Blood
Testes

Carcinogenicity
For the major component(s): Did not cause cancer in laboratory animals.

Teratogenicity
For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals. In laboratory animals, boron compounds have caused birth defects only at doses toxic to the mother and have been toxic to the fetus at doses nontoxic to the mother.

**Reproductive toxicity**
For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility. In animal studies, boron compounds have been shown to interfere with fertility in males, and to a lesser degree in females.

**Mutagenicity**
For the major component(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

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

### 12. ECOLOGICAL INFORMATION

*Ecotoxicological information on this product or its components appear in this section when such data is available.*

**Toxicity**

**Propylene glycol**

**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), static test, 96 Hour, 40,613 mg/l, OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**
LC50, Ceriodaphnia dubia (water flea), static test, 48 Hour, 18,340 mg/l, OECD Test Guideline 202

**Acute toxicity to algae/aquatic plants**
ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate inhibition, 19,000 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**
NOEC, Pseudomonas putida, 18 Hour, > 20,000 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Ceriodaphnia dubia (water flea), semi-static test, 7 d, number of offspring, 13,020 mg/l

**Sodium benzoate**

**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, Pimephales promelas (fathead minnow), static test, 96 Hour, > 100 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), static test, 96 Hour, > 100 mg/l
Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, > 100 mg/l

BORON POTASSIUM OXIDE (B4K2O7), TETRAHYDRATE
Acute toxicity to fish
For this family of materials:
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
For this family of materials:
LC50, dab (Limanda limanda), flow-through, 96 Hour, 74 mg/l

Acute toxicity to aquatic invertebrates
For this family of materials:
LC50, Daphnia magna (Water flea), static test, 48 Hour, 173 mg/l, OECD Test Guideline 202 or Equivalent

Persistence and degradability

Propylene glycol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).
10-day Window: Pass
Biodegradation: 81 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Biodegradation: 96 %
Exposure time: 64 d
Method: OECD Test Guideline 306 or Equivalent

Theoretical Oxygen Demand: 1.68 mg/mg

Chemical Oxygen Demand: 1.53 mg/mg

Biological oxygen demand (BOD)

<table>
<thead>
<tr>
<th>Incubation Time</th>
<th>BOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 d</td>
<td>69.000 %</td>
</tr>
<tr>
<td>10 d</td>
<td>70.000 %</td>
</tr>
<tr>
<td>20 d</td>
<td>86.000 %</td>
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</tbody>
</table>

Photodegradation
Atmospheric half-life: 10 Hour
Method: Estimated.

Sodium benzoate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: > 74 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent

**BORON POTASSIUM OXIDE (B4K2O7), TETRAHYDRATE**

**Biodegradability:** Biodegradation is not applicable.

**Bioaccumulative potential**

**Propylene glycol**

- **Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
- **Partition coefficient: n-octanol/water(log Pow):** -1.07 Measured
- **Bioconcentration factor (BCF):** 0.09 Estimated.

**Sodium benzoate**

- **Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
- **Partition coefficient: n-octanol/water(log Pow):** -2.27 Estimated.

**BORON POTASSIUM OXIDE (B4K2O7), TETRAHYDRATE**

- **Bioaccumulation:** No relevant data found.

**Mobility in soil**

**Propylene glycol**

- Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
- Potential for mobility in soil is very high (Koc between 0 and 50).
- **Partition coefficient(Koc):** < 1 Estimated.

**Sodium benzoate**

- No relevant data found.

**BORON POTASSIUM OXIDE (B4K2O7), TETRAHYDRATE**

- No relevant data found.

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**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: Recycler. Reclaimer. Incinerator or other thermal destruction device.
14. TRANSPORT INFORMATION

**DOT**
Not regulated for transport

**Classification for SEA transport (IMO-IMDG):**
- Not regulated for transport
- 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):**
Not regulated for transport

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

**OSHA Hazard Communication Standard**
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312**
This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.

**Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Pennsylvania Worker and Community Right-To-Know Act:**
The following chemicals are listed because of the additional requirements of Pennsylvania law:

<table>
<thead>
<tr>
<th>Components</th>
<th>CASRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>57-55-6</td>
</tr>
</tbody>
</table>

**California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)**
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)
The product contains an intentional component that is not on the inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
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Revision
Identification Number: 101266728 / A001 / Issue Date: 04/16/2015 / Version: 2.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

<table>
<thead>
<tr>
<th>TWA</th>
<th>8-hr TWA</th>
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<tbody>
<tr>
<td>US WEEL</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
</tbody>
</table>

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.

THE DOW CHEMICAL COMPANY 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.