



## Operator Manual Accessories



### Mixing/Booster

S.N. 1574-01 -

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# 1. Warranty Policies & Claim Procedures

**DRYAIR MANUFACTURING CORP.** (referred to within as DRYAIR) warrants its new, unused equipment to be free of defects in material and workmanship at the time of delivery to the original retail purchaser.

## Warranty Policies

### Basic Warranty Policy

- DRYAIR will repair or replace, at its option, without charge, any defective part of the equipment for a period of twelve (12) months from delivery to the first retail purchaser, F.O.B St. Brieux, SK., Canada.
- Any parts that are covered by an extended warranty published by DRYAIR are an exception to the Basic Warranty policy and are to be warranted as per the details of the Extended Warranty Policy.
- Labour is covered as per DRYAIR flat labour rate.
- The Warranty Policy, terms and conditions, may change from time to time without prior notice.
- Warranty terms and conditions are transferable in the event of the sale to a second owner.
- Replacement parts will be warranted for 90 days from the repair date. Bill of sale must accompany the warranty claim.
- The terms of this Warranty Policy are subject to provincial and state legislation. DRYAIR reserves the right to make modifications in accordance with provincial and state legislation without prior notice or obligation.

### Extended Warranty Policy

#### Heat Exchanger

- An extended warranty is available on the heat exchanger unit of the water heater assembly. The available warranty for a part, under the extended warranty policy, is prorated by 20% per year.
- Shipment date is the date to be used for the commencement of the warranty period.
- Coverage schedule

Year 1 - 100%

Year 2 - 80%

Year 3 - 60%

Year 4 - 40%

Year 5 - 20%

### **Exceptions to the Warranty Policies**

- Under no circumstance shall the owner be entitled to recover costs for incidental, special or consequential damages such as, but not limited to: loss of profit or revenue, other commercial losses, inconvenience and/or replacement equipment rental cost.
- Maintenance, repair or service items not related to warrantable defects.
- Loss or damage during shipping.
- Failure resulting from lack of or improper maintenance.
- Damage caused by operator abuse, negligence or improper operation.
- Damage resulting from improper voltage supply.
- Damage from improper installation. Installation done by other than the manufacturer.
- Non-defective items replaced at the request of the customer.
- Damage due to accidents.
- Damage resulting from improper fuel supply (i.e. pressure or contamination).
- Damage resulting from cracked or broken lines occurring during transport.
- Damage resulting from use of inadequate or improper fluids (i.e. Glycol or oil).
- Mileage is not covered.
- Glycol is considered a consumable and will not be covered under the warranty policy.
- Generators carry their own warranty coverage through their own manufacturers. Please refer generator issues to the OEM. Contact information may be found in the Service & Operators Manual under Optional Equipment.

### **Owner Obligations**

- It is the responsibility of the owner, at the owner's expense, to transport the equipment to the service facility of an authorized DRYAIR distributor/dealer or alternately to reimburse the distributor/dealer, for any traveling expenses incurred in fulfilling this warranty.
- The terms of this Warranty Policy are subject to provincial and state legislation. DRYAIR reserves the right to make modifications in accordance with provincial and state legislation without prior notice or obligation.
- It is the responsibility of the owner to read, understand and implement the maintenance, safety and operational guidelines as laid out in the Operation and Maintenance Guide.
- All parts are to be tagged with warranty claim number and shipped prepaid to DRYAIR within 30 days.

### **Manufacturer Obligations**

- DRYAIR reserves the right to continually improve the product's parts or specifications at any time without notice or obligation.
- The terms of this Warranty Policy are subject to provincial and state legislation. DRYAIR reserves the right to make modifications in accordance with provincial and state legislation without prior notice or obligation.

## Warranty Claim Procedure

- All warranty credits must be processed with the DRYAIR Warranty Claim Form.
- All warranty parts, unless otherwise specified, are to be returned to DRYAIR along with a completed Warranty Claim Form.

**Note:** Prior to returning warranty parts, please call for an authorization number and shipping instructions from the Warranty department in Canada.

Location of Warranty Depots:

<b>USA</b>	<b>Canada</b>
DRYAIR Manufacturing Corp. 410 Douglas Road, Box 264 Bradner, OH 43406 Ph. 1 (888) 750-1700	DRYAIR Manufacturing Corp. 400 Service Road, Box 126 St. Brieux, SK S0K 3V0 Ph. 1 (888) 750-1700

- Each warranty claim should only refer to one Serial or Production Schedule numbered unit.
- Warranty parts are to be tagged with warranty claim number.
- When claiming for warranty labour, the allowable warranty labour rate will be \$85.00/hour. The factory reserves the right to adjust the number of hours claimed where deemed necessary.
- The factory may at times specify allowable labour for certain warranty procedures.
- Mileage and travel time to/from the customer are not eligible for warranty credit.
- Freight charges for warranty parts are not eligible for warranty credit.
- Labour flat rates for component changes:
  - Electrical Components - 0.5hr
    - Relays
    - Switches
    - Thermostats
    - Breakers
  - Plumbing Components - 1hr
    - Flow Reverser
    - Flow Switch
    - Valves
  - Electric Motor Changes - 1hr
    - Hose Reel
  - Glycol Pump Changes - 2hrs

**Note:** Other labour charges will be at the discretion of DRYAIR.



## 2. Safety Concerns

### General Safety Guidelines

- Make certain that the operator reads and understands all the information in this manual.
- All unauthorized people must be kept away from the equipment when in operation.
- All guards must be in place when the equipment is in operation.
- Maintain instructional and safety decals. Replace damaged decals (*Figure 1*).

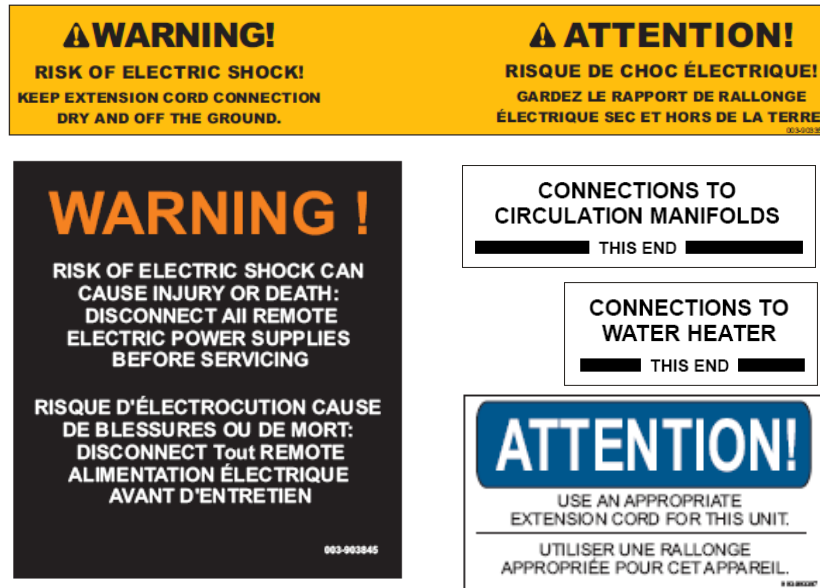


Figure 1 - Safety Decals

## Water Heater Module

**CAUTION!** *The water heater is a heating appliance.*

- Observe all posted warnings and cautions when dealing with any heating appliance.
- Keep children and pets away from all piping and fuel accessories.
- While the system is operating the water heater housing panels must be kept closed to prevent drafts from affecting water heater operation.

The key advantage to the DRYAIR system, in addition to better temperature control abilities over other heating methods, is that there is only one flame point and only one fueling point. This means fewer sets of environmentally sensitive equipment to manage. In the DRYAIR system, the heat transfer around your site is almost entirely managed by low-pressure Heat Transfer Fluid lines.

## Heat Transfer Fluid (HTF)

Follow the following precautions and measures when working with “heat transfer fluid” (“DOWFROST\* HTF” & “BOSS CHILL PG”).

### Fluid Handling Precautions

- Ventilation ..... Good general ventilation should be sufficient for most conditions.
- Respiratory protection No respiratory protection should be needed.
- Skin protection ..... For brief contact, no precautions other than clean, body-covering clothing should be needed.  
..... Use impervious gloves when prolonged or frequently repeated contact should occur.
- Eye protection ..... Use safety glasses.

### First Aid Measures

- Eyes ..... Flush eyes with plenty of water.
- Skin ..... Wash off in flowing water or shower.
- Ingestion ..... Induce vomiting if large amounts are ingested.  
..... Consult medical personnel.
- Inhalation ..... Remove to fresh air if effects occur.  
..... Consult a physician.
- Note to Physician ..... No specific antidote.  
..... Supportive care.  
..... Treatment based on judgment of the physician in response to reactions of the patient.

*For complete “heat transfer fluid” information, refer to the Material Safety Data Sheets for “Dowfrost HTF” & “Boss Chill PG” included with the manuals package*

## 3. Introduction

### Mixing/Booster

The Mixing/Booster is a three-function component which ensures maximum flexibility in the use of the DRYAIR system.

- Tempering mode supplies lower temperature fluid for concrete cure and radiant floor heat applications eliminating the need to reduce the water heater operating temperatures below safe operating ranges.
- Booster mode allows the system to increase flow rates or function as a pumping station to increase pumping distances over 300ft. per station.
- The DRYAIR system also allows for dual-temperature control. High temperature fluid can be provided to portable heat exchangers, along with a lower temperature fluid for concrete cure and radiant floor hear applications.
- It can provide heat transfer fluid tempering, dual temperature control and pressure and flow boost.



*Figure 2 - Mixing/Booster Pump*

## Accessories

### Extension Reservoir Assembly

The Extended Reservoir Tank is required in scenarios when “portable heat exchangers” are higher than the top level of the glycol reservoir tank. If the Extended Reservoir tank is not used, the following can occur:

- **Insufficient Fluid in the System**

Fluid can drain back to the heat transfer reservoir tank from the over-elevated fluid lines when the pump is shut off. The heat transfer reservoir tank will show adequate fluid, but when the pump is started, extra fluid will be required to recharge the over-elevated fluid lines and portable heat exchangers and the system will then have insufficient fluid in the reservoir.

- **Fluid Overflow**

If fluid is added to maintain proper fluid levels while the pump is running, overflow at the reservoir tank may occur when the pump is shut off. This would occur because of the drain back from the over-elevated fluid lines.

### Optional Remote Manifold

- The optional remote manifold allows for additional distribution and/or separation between the central heating trailer and the manifold.

### Insulated Line Jackets

- Insulated circulation line jackets are also available. These insulated jackets will prevent exposed circulation line heat loss in extreme sub-zero conditions.

### Portable Heat Exchangers

Portable heat exchangers are the ideal way to heat and/or dry enclosed structures. Their compact and mobile design allows them to be positioned where they are required on the job site. The efficient fan/coil design provides a high rate of heat transfer. High volume fans then deliver this heat evenly throughout a large area. The clean, low relative humidity heat delivery minimizes energy costs by eliminating the need to draw in fresh outside air. With the DRYAIR system, you just reheat warm internal air, rather than heating cold external air.

**Note:** Disengage Flow Reverser when using this accessory.



Figure 3 - Extended Reservoir Tank



Figure 4 - Optional Remote Manifold



Figure 5 - Portable Heat Exchangers

### Plate Heat Exchanger

The Plate Heat Exchanger module creates two separate fluid loops. It can extend the range of the HTF distribution and eliminate the need for extended reservoirs in elevated applications. The plate heat exchanger, combined with a central heating module can be used:

- To extend the effective range and lengths of the primary distribution lines.
- In a multi-story application to extend the vertical distance from the heating module that a portable heat exchanger.

**Note:** *Disengage Flow Reverser when using this accessory.*



Figure 6 - Plate Heat Exchanger Unit

## How the System Works

The DRYAIR system uses a low-pressure, open fluid loop system with an atmospherically vented fluid reservoir. A hydronic water heater warms the heat transfer fluid. The heated fluid is pumped through a distribution system loop, passing through heat exchangers in remote locations.

Two types of exchangers are available:

### Powered Heat Exchangers

- Portable heat exchangers include a heat transfer coil, fan and thermostatic temperature control. The heat transfer fluid flows through the transfer coil, where heat is transferred to the air being drawn through the coil by the fan. The coil is specially designed for optimum heat transfer, without adding any moisture or combustion by-products to the air.

### Passive Heat Exchangers

- Circulation line heat exchangers use flexible hose with hydraulic-style quick couplers for ease in hookup. Heat transfer occurs by direct contact and radiant heat conduction.

The Mixing/Booster unit can be utilized to:

- Provide lower temperature fluid for concrete cure and radiant floor heat applications.
- Provide dual temperature control with a single fluid circulation system.
- Boost fluid flow and increase pumping distances.

The plate heat exchangers combined with a central heating module is an option to consider for delivering heat on a multi-storied project, where there will be a significant difference in elevation between the central heating module and the powered heat exchangers.

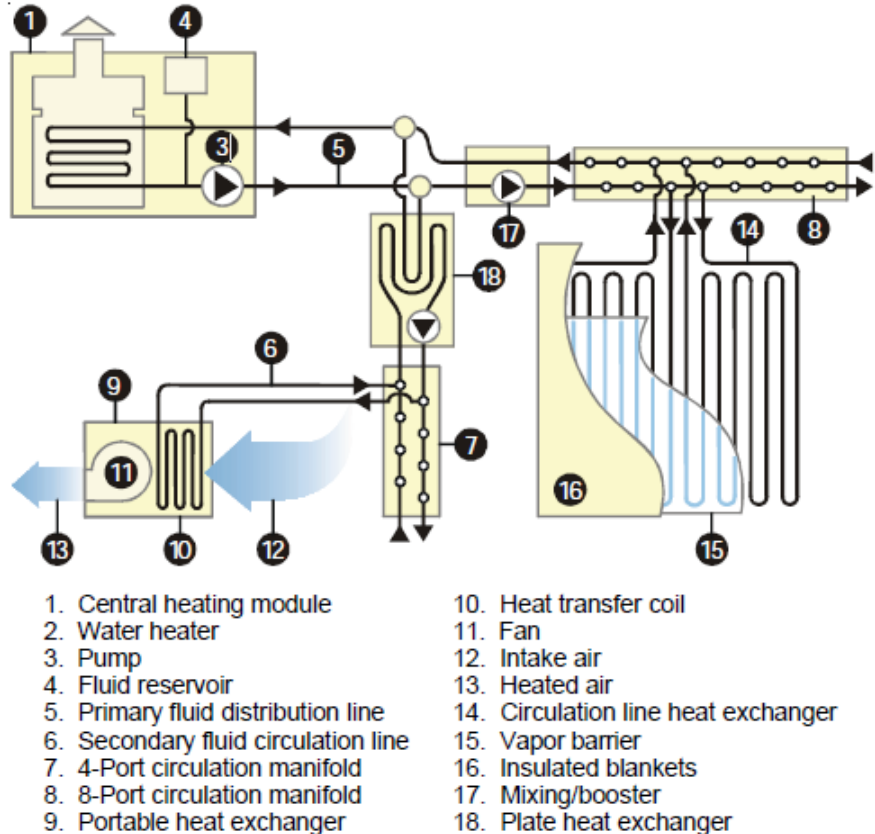


Figure 7 - How the DRYAIR System Works

## 4. Setup

**CAUTION!** It is very important that you read and understand this manual before operating the Mixing/Booster. Failure to follow the procedures and cautions in this manual could lead to injury or improper function of the Mixing/Booster.

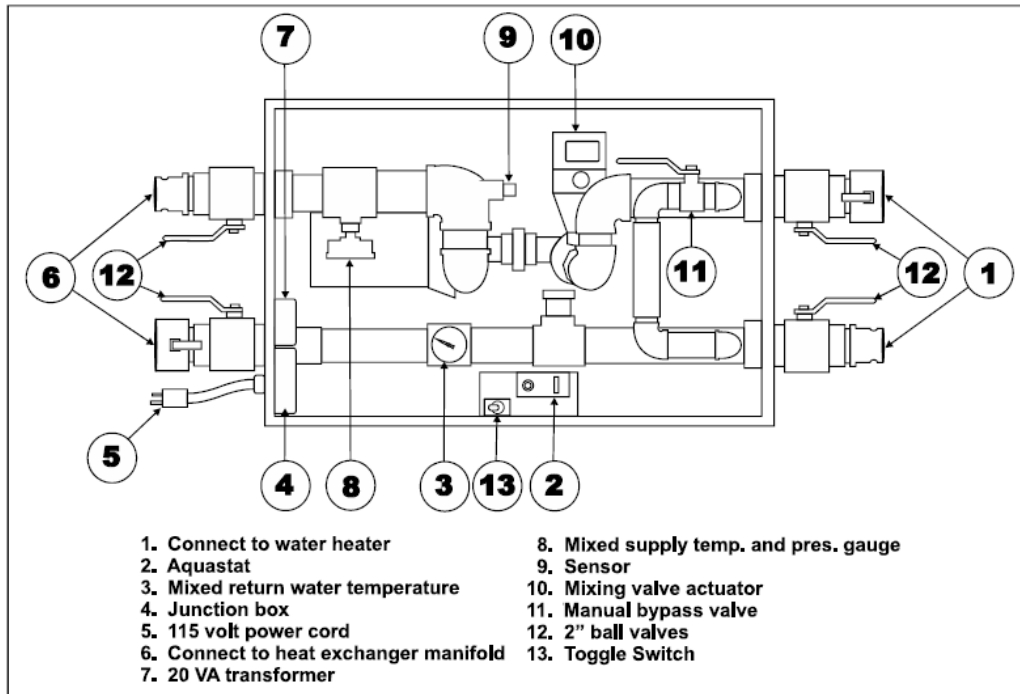


Figure 8 - Mixing/Booster Component Overview

### Dual Temperature Control Function

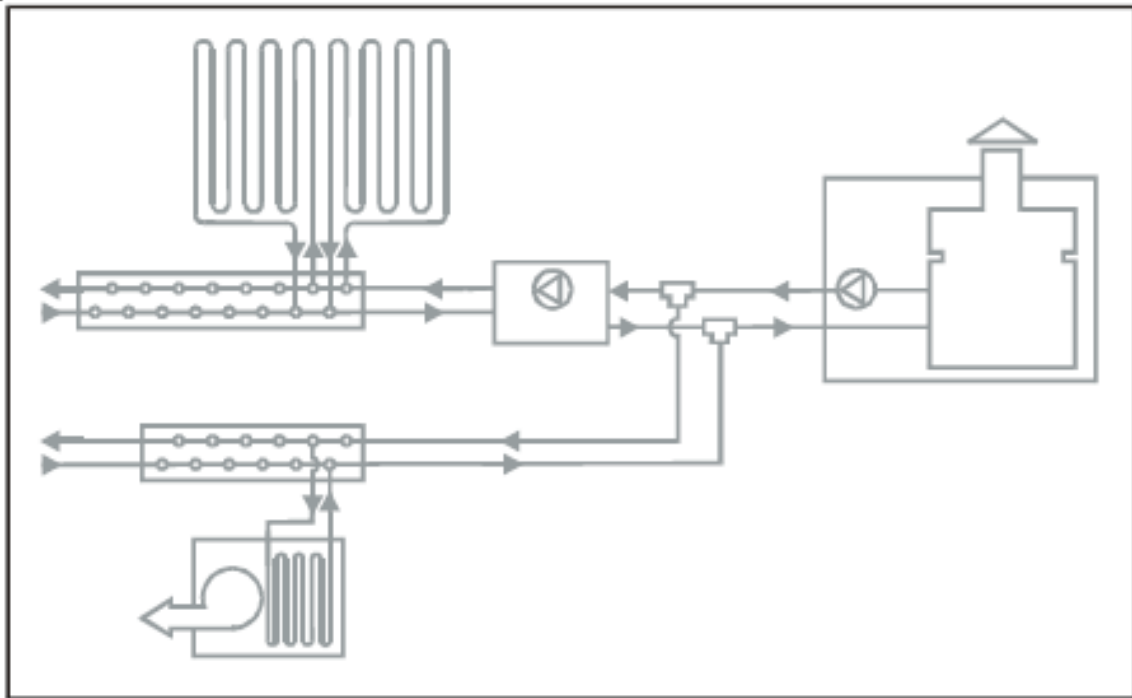
Use these setup instructions to provide dual temperature control to one fluid circulation system.

- Position Mixing/Booster before the circulation manifold serving the heat exchangers involved with the lower temperature applications.
- Connect couplers (1) to the circulation lines leading to the water heater module.
- Connect couplers (6) to the circulation manifold, or circulation lines leading to the circulation manifold(s).
- A circulation manifold serving full hot supply heat transfer fluid must only be inserted into the circulation system between the Mixing/Booster and the central heating unit.

**Note:** Flow availability through the circulation manifold placed in between the Mixing/Booster and the water heater module may vary depending on the application being utilized.

- If there is an active circulation manifold between the Mixing/Booster and the water heater module, the manual by-pass valve (11) is to be in the closed position. If that circulation manifold is inactive (no flow), the manual by-pass valve (11) is to be placed in the fully open position.
- Flip the toggle switch (13) to the Dual Heat Control position.
- Set the dial on the aquastat (2) for the desired output water temperature. The aquastat controls the modulation/mixing valve (10) which, when open will introduce lower temperature return fluid into the supply side. The desired output temperature is achieved with the mixing of the two fluids.

*For Dual Heat Control Function, utilize layout as shown below.*



*Figure 9 - Dual Heat Control Function*

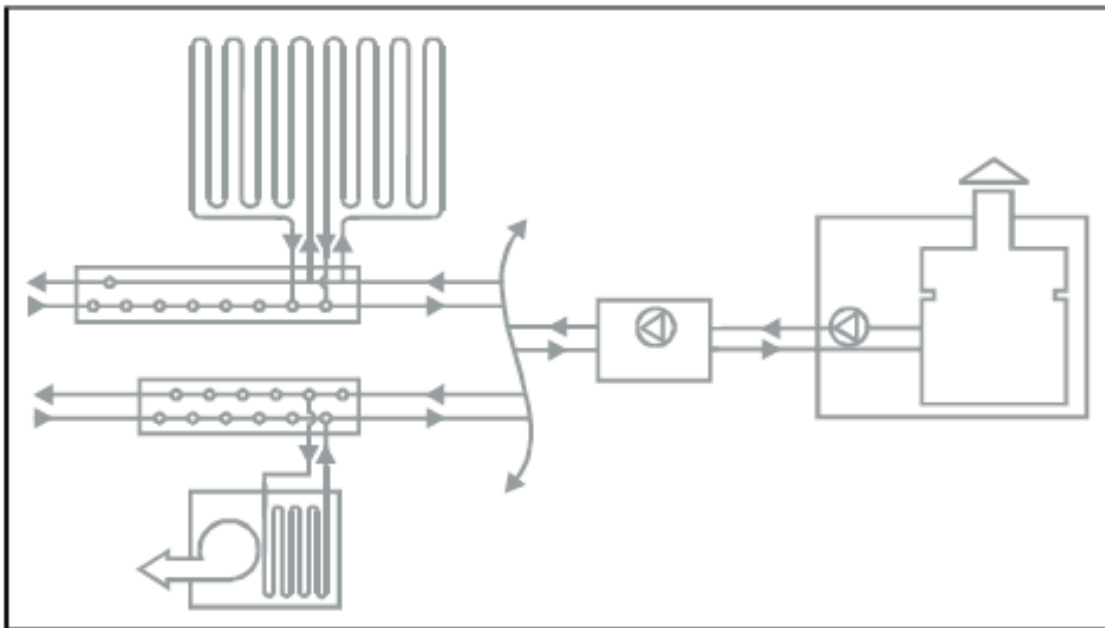


## Pressure & Flow Boost Function

Use these setup instructions to boost flow and increase the pumping distances in fluid circulation system.

- Position where flow and pressure increase are required. The Mixing/Booster may be as much as 300ft. up-line from the water heater module or another Mixing/Booster.
- Connect couplers (1) to the circulation lines leading to the water heater module.
- Connect couplers (6) to the circulation lines leading to the circulation manifold(s).
- The manual bypass valve (11) is to be placed in the fully open position.
- Flip the toggle switch (13) to the Pressure/Flow Boost position.
- Set the dial on the aquastat (2) for the desired output water temperature. This setting should be at least as high as the water heater supply temperature setting.

*For Pressure and Flow Boost Function utilize layout as shown below:*



*Figure 10 - Pressure and Flow Boost Function*

## Electrical Requirements & Connection

- The Mixing/Booster require a 115V, 15amp power supply.
- Each unit is factory equipped with a 115V appliance cable and plug.
- A maximum of 50ft. 12 AWG (or equivalent) extension cord can be run to the Mixing/Booster. For distances greater than 50ft. use 10 AWG.
- Electrical schematic can be found in **Appendix - Electrical Schematic**.

## Heat Transfer Fluid (HTF)

**CAUTION!** At no time should you use automobile antifreeze in your system. The use of automobile antifreeze will void your warranty.

### HTF Specifications

- DRYAIR pre-mixed “HTF” fluid is made up of 50% “Dowfrost ® HTF” or “Boss Chill PG” and 50% water, by weight - freeze protection down to -28°F (-33°C).
- The “glycol/water mixture chart” will provide you with more information on the proper mixture for your area (*Figure 11*).
- Soft water with a neutral pH level (#7) must be used.

Percent Propylene Glycol		Freezing Point	
By Mass	By Volume	°F	°C
0.0	0.0	32.0	0.0
10.0	9.6	26.1	-3.2
20.0	19.4	17.9	-7.8
30.0	29.4	6.7	-14.0
40.0	39.6	-8.1	-22.3
50.0	49.9	-28.9	-33.8
60.0	60.0	-54.9	-48.3

*Figure 11 - Glycol Mixing Guide*

**CAUTION!** Whenever coupling or uncoupling quick couplers, make sure that the isolation valves are closed, and the pump is off. Failure to do so may put you at risk of injury from eye and/or skin exposure to hot glycol.

# 5. Operation

## Start Up

- Open all 2” ball valves (12) entering and leaving the Mixing/Booster, as well as all valves at the portable manifold being supplied by the Mixing/Booster.
- Initiate startup of the water heater module to provide hot water to the Mixing/Booster.
- To initiate startup of the mixing/booster unit, plug in its power supply. It may take a few minutes for the temperature to stabilize, but the unit should maintain an outgoing water temperature very close to the set point of the aquastat (2).

*Note: A 115V, 15amp circuit is required. The supply cord should be a minimum of 14 gauge. If the cord length exceeds 75 feet, a 12gauge cord must be utilized.*

- Close cabinet lid when the procedure is complete.

## Control Settings

The Mixing/Booster has two control settings that are preset at factory. The settings are as follows:

1. Johnson Control A350P
  - Throt Range
  - Min Output
  - Dip Settings
  - Reverse Acting
2. Honeywell Actuator (ML7984A)
  - Dip Settings

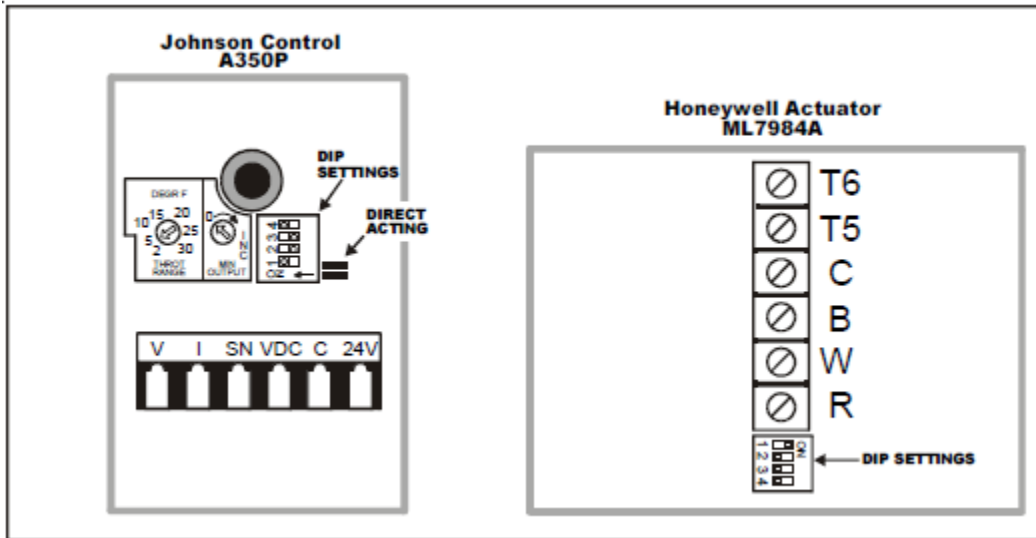


Figure 12 - Control Setting

## 6. Troubleshooting

### Mixing/Booster Pump

#### Mixing/Booster Pump Does Not Start

No Power

- Check that the power supply is connected, and breakers are on.
- Check the power connection cable (appliance cable).

#### Mixing/Booster Pump Running, but No Heat

If fluid inlet is cold:

- Check that all valves (Mixing/Booster pump and circulation system valves back to water heater) are open and fluid is circulating. If valves are closed, open valves to initiate flow. If valves are open and there is not circulation, but the fluid is cold, the problem is at the water heater. Refer to Water Heater Module operator's manual – Troubleshooting section.

Fluid inlet is hot, but the outlet is cold and still no heat:

- Check Mixing/Booster actuator valve for actuator operation. Refer to Honeywell Actuator Valve manual.
- Check that setting on the temperature control (aquastat) is at the desired operating temperature and the supply temperature is lower than the set point.
- Check well sensor (electronic) and verify that it is intact and positioned properly in its well.

#### Heat Transfer Fluid is Leaking

- Check all connection fittings and hoses. Tighten as required.
- Shut down the fan and check the coil for leaks. Replace coil if leaks are found.

**FOR ADDITIONAL ASSISTANCE CALL DRYAIR TECHNICAL SUPPORT 1 (888) 750-1700**

## 7. Maintenance

The DRYAIR system is designed to be a low maintenance system. All system equipment is assembled using extensively tested and certified components. Following these maintenance procedures will ensure maximum benefit and minimal downtime for the system.

The daily maintenance schedule is designed to be a quick system check and ensures a low risk of operating interruptions.

### Daily Checklist

#### **Check Mixing/Booster Cabinet Every Day for Heat Transfer Fluid**

- If fluid is found inside the cabinet, check for leaks at all fittings and connections in the Mixing/Booster cabinet as well as the fluid circulation system.
- For Heat Transfer Fluid handling precautions, refer to the Material Safety Data Sheets at the back of this manual.

#### **Check the Supply Temperature Gauge**

- Verify that the supply temperature gauge is within 10°F of the temperature control setting.

#### **Check the Gauge Panel at Regular Intervals for Any Irregular Gauge Readings**

### Seasonal Checklist

#### **Circulation Pump**

- The pump requires no special maintenance other than that specified in the manufacturer's pump manual provided as part of the literature package with each DRYAIR system.

#### **Hoses**

- Periodically check all hoses for damage due to aging, elevated temperatures, over-torqued hose clamps, abrasion and weathering.
- Replace damaged hoses as required.
- Seasonally check hose clamps torqued and adjust accordingly.

#### **Heat Transfer Fluid**

- A clean, properly maintained hot water system should not be drained unless: there is a possibility of freezing, the boiler has accumulated a considerable amount of sludge or dirt on the water side, or draining is necessary to permit repairs. Very little sludge should be accumulated in a water heater where little make-up water is added and where an appropriate water heater water treatment is maintained at proper strength.

- The Heat Transfer Fluid should be tested from year to year for freeze protection and should be strong enough for your area. The Heat Transfer Fluid should be checked with a refractometer (see- Appendix, Heat Transfer Fluid, Glycol/Water Mixture Chart for Mixing Ratios).
- The pH level of the Heat Transfer Fluid requires an annual check to see if the pH level is neutral. The pH level should be at #7. This should be checked with a pH instrument.

# 8. Appendix



		P.O Box 126 400 Service Road St. Brieux, Sk. Canada	
Model / Module:			
Production Schedule / Calendrier de Production:			
Reference / Référence:			
<b>Motor Data / Données Moteur</b>			
HP			
Volts			
Hz	60		
Ambient / Ambiant	60°C		
RPM			
Max. Ampacity / Max. Ampacité:			
Speed / Vitesse:			
Certified for Indoor and Outdoor Use / Certifié pour l'utilisation à l'intérieur et à l'extérieur			
		Max. Inlet Water Temperature / Température Maximale de L'eau d'Entrée:	85°C
003-903386 R01			

Figure 13 - Mixing Booster Data & Serial Plate

# Electrical Schematic

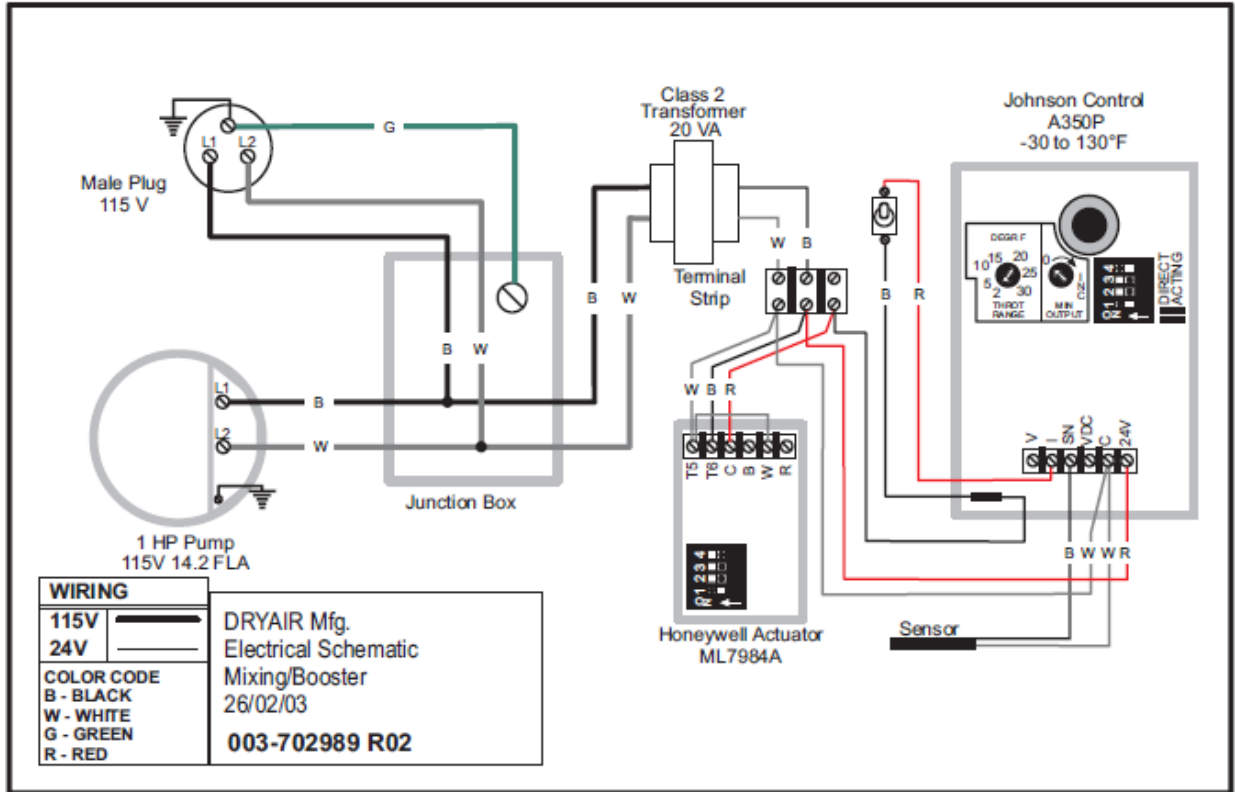


Figure 14 - Mixing/Booster Electrical Schematic





## **Material Safety Data Sheets**

The Material Safety Data Sheets (MSDS) included with this manual have been provided by DRYAIR's suppliers.



# SAFETY DATA SHEET

Issuing Date 03-Jun-2019

Revision date 03-Jun-2019

Revision Number 1

## 1. Identification

### Product identifier

Product Name BOSS Chill Propylene Glycol

### Other means of identification

Product Code(s) GHSRBS-041

UN/ID no. UN 3082

Synonyms None

### Recommended use of the chemical and restrictions on use

Recommended use Heat transfer medium

Restrictions on use No information available

### Details of the supplier of the safety data sheet

#### Initial supplier identifier

BOSS Lubricants

#### Manufacturer Address

6303 30 ST SE Calgary, AB T2C 1R4

### Emergency telephone number

Initial supplier phone number (800) 844-9457  
Emergency Telephone Chemtrec 1-800-424-9300

## 2. Hazard(s) identification

### Classification

Not a hazardous substance or mixture according to the Globally Harmonized System (GHS) and Canada's Hazardous Products Regulations

### Label elements

#### Hazard statements

Not a hazardous substance or mixture according to the Globally Harmonized System (GHS) and Canada's Hazardous Products Regulations.



**Precautionary Statements - Disposal**

Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

**Other information****3. Composition/information on ingredients****Substance**

Chemical name	CAS No.	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Water	7732-18-5	0.1 - 1	-	
Propylene glycol	57-55-6	80 - 100	-	
PROPRIETARY ADDITIVES	PROPRIETARY	1 - 5	-	

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

**4. First-aid measures****Description of first aid measures**

<b>Inhalation</b>	Remove to fresh air. If not breathing, give artificial respiration. IF exposed or concerned: Get medical advice/attention.
<b>Eye contact</b>	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if symptoms occur.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed**

<b>Symptoms</b>	Prolonged contact may cause redness and irritation.
-----------------	---

**Indication of any immediate medical attention and special treatment needed**

<b>Note to physicians</b>	Treat symptomatically.
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**5. Fire-fighting measures**

<b>Suitable Extinguishing Media</b>	Carbon dioxide (CO <sub>2</sub> ). Foam. Dry chemical. Water spray or fog. Alcohol resistant foam.
<b>Unsuitable extinguishing media</b>	Do not scatter spilled material with high pressure water streams.
<b>Specific hazards arising from the chemical</b>	Use water spray to cool fire-exposed containers and structures. Isolate and restrict area access. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Container may rupture from gas generation in a fire situation. Fight fire from a safe distance and from a protected location. Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity. Consider use of unmanned hose holder or monitor nozzles.
<b>Explosion data</b>	
<b>Sensitivity to mechanical impact</b>	None.
<b>Sensitivity to static discharge</b>	None.
<b>Special protective equipment for fire-fighters</b>	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

## 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Use personal protective equipment as required. See section 8 for more information. Ensure adequate ventilation.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Keep out of drains, sewers, ditches and waterways. Ventilate the area. Avoid breathing vapors or mists.

**Methods for cleaning up** Cover liquid spill with sand, earth or other noncombustible absorbent material. Prevent product from entering drains.

## 7. Handling and storage

### Precautions for safe handling

**Advice on safe handling** Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with skin, eyes or clothing. Use only with adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Do not ingest. If swallowed then seek immediate medical assistance. For industrial use only.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Do not contaminate food or feed stuffs. Store only in containers resistant to alkaline solutions with a pH of 9.0 to 12.0.

## 8. Exposure controls/personal protection

### Control parameters

**Exposure Limits** This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

### Appropriate engineering controls

**Engineering controls** Ensure adequate ventilation, especially in confined areas.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** Wear safety glasses with side shields (or goggles). If splashes are likely to occur, wear safety glasses with side-shields. Avoid contact with eyes.

**Hand protection** Wear suitable gloves.

**Skin and body protection** Wear suitable protective clothing.

**Respiratory protection** No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

**General hygiene considerations** Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

### Information on basic physical and chemical properties

**Physical state** Liquid  
**Appearance** No information available  
**Color** purple  
**Odor** Odorless  
**Odor threshold** No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	9.0– 10.5	
Melting point / freezing point	No data available	None known
Boiling point / boiling range	188 °C / 317 °F	ASTM D7213
Flash point	116 °C / 240 °F	ASTM D93
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Relative density	No data available	None known
Water solubility	completely soluble	
Solubility in other solvents	No data available	None known

Partition coefficient	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known

**Other information**

Explosive properties	No information available.
Oxidizing properties	No information available.
Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Liquid Density	No information available
Bulk density	No information available

**10. Stability and reactivity**

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents. Strong acids.
Hazardous decomposition products	Thermal decomposition can lead to release of irritating and toxic gases and vapors.

**11. Toxicological information****Information on likely routes of exposure****Product Information**

Inhalation	No known effects under normal use conditions.
Eye contact	Irritating to eyes.
Skin contact	Avoid contact with skin and clothing.
Ingestion	Harmful if swallowed. Ingestion of larger amounts may cause defects to the central nervous system (e.g. dizziness, headache). Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause adverse kidney effects.

**Symptoms related to the physical, chemical and toxicological characteristics**

Symptoms	No information available.
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**Acute toxicity**

**Numerical measures of toxicity**  
No information available

**Unknown acute toxicity** No information available  
Product Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Propylene glycol 57-55-6	= 20 g/kg ( Rat )	= 20800 mg/kg ( Rabbit )	Not available

#### **Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Skin corrosion/irritation** Based on available data, the classification criteria are not met.

**Serious eye damage/eye irritation** Based on available data, the classification criteria are not met.

**Respiratory or skin sensitization** Based on available data, the classification criteria are not met.

**Germ cell mutagenicity** Based on available data, the classification criteria are not met.

**Carcinogenicity** Based on available data, the classification criteria are not met.

**Reproductive toxicity** Based on available data, the classification criteria are not met.

**STOT - single exposure** Based on available data, the classification criteria are not met.

**STOT - repeated exposure** Based on available data, the classification criteria are not met.

**Aspiration hazard** No information available.

## **12. Ecological information**

**Ecotoxicity** Harmful to aquatic life.

**Persistence and degradability** No information available.

**Bioaccumulation** No information available.

**Other adverse effects** No information available.

## **13. Disposal considerations**

### **Waste treatment methods**

**Waste from residues/unused products** Dispose of waste in accordance with environmental legislation.

**Contaminated packaging** Do not reuse empty containers.

## 14. Transport information

<u>Transport Canada</u>	Not regulated
<u>TDG</u>	Not regulated
<u>DOT</u>	Not regulated unless shipping container holds at least 5,000 pounds.
UN/ID no.	UN 3082
Hazard class	9
Packing group	III
<u>MEX</u>	Not regulated
<u>ICAO (air)</u>	no data available
<u>IATA</u>	no data available
<u>IMDG</u>	no data available
<u>RID</u>	no data available
<u>ADR</u>	no data available
<u>ADN</u>	no data available

## 15. Regulatory information

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

#### International Regulations

The Montreal Protocol on Substances that Deplete the Ozone Layer Not applicable

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Rotterdam Convention Not applicable

#### International Inventories

TSCA	Complies.
DSL/NDSL	Complies.
EINECS/ELINCS	Contact supplier for inventory compliance status.
ENCS	Contact supplier for inventory compliance status.
IECSC	Contact supplier for inventory compliance status.
KECL	Contact supplier for inventory compliance status.
PICCS	Contact supplier for inventory compliance status.
AICS	Contact supplier for inventory compliance status.

#### Legend:

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**ENCS** - Japan Existing and New Chemical Substances

**IECSC** - China Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances



AICS - Australian Inventory of Chemical Substances

**16. Other information**

<b>NFPA</b>	Health hazards 2	Flammability 1	Instability 0	Physical and chemical properties -
<b>HMIS</b>	Health hazards 2	Flammability 1	Physical hazards 0	Personal protection X

**Key or legend to abbreviations and acronyms used in the safety data sheet****Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

**Key literature references and sources for data used to compile the SDS**

Agency for Toxic Substances and Disease Registry (ATSDR)  
 U.S. Environmental Protection Agency ChemView Database  
 European Food Safety Authority (EFSA)  
 EPA (Environmental Protection Agency)  
 Acute Exposure Guideline Level(s) (AEGl(s))  
 U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act  
 U.S. Environmental Protection Agency High Production Volume Chemicals  
 Food Research Journal  
 Hazardous Substance Database  
 International Uniform Chemical Information Database (IUCLID)  
 Japan GHS Classification  
 Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)  
 NIOSH (National Institute for Occupational Safety and Health)  
 National Library of Medicine's ChemID Plus (NLM CIP)  
 National Library of Medicine's PubMed database (NLM PUBMED)  
 National Toxicology Program (NTP)  
 New Zealand's Chemical Classification and Information Database (CCID)  
 Organization for Economic Co-operation and Development Environment, Health, and Safety Publications  
 Organization for Economic Co-operation and Development High Production Volume Chemicals Program  
 Organization for Economic Co-operation and Development Screening Information Data Set  
 RTECS (Registry of Toxic Effects of Chemical Substances)  
 World Health Organization

**Issuing Date** 03-Jun-2019

**Revision date** 04-Jun-2019

**Revision Note** No information available.

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**

**Data for Regulatory Rules**

Region	Template name	Revision Note
Canada	HGHS	2.0

### GHS Product Information

pH	9.0– 10.5
Physical state	Liquid
Flash point °C	116
Boiling point / boiling range °C	188

### Component Information

### Canada

#### GHS Classification

Not Hazardous

Not a hazardous substance or mixture according to the Globally Harmonized System (GHS) and Canada's Hazardous Products Regulations

Precautionary Statements - Disposal

Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable



# SAFETY DATA SHEET

## DOW CHEMICAL CANADA ULC

**Product name:** DOWFROST™ Heat Transfer Fluid

**Issue Date:** 12/16/2019

**Print Date:** 12/17/2019

DOW CHEMICAL CANADA ULC 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.

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## 1. IDENTIFICATION

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**Product name:** DOWFROST™ Heat Transfer Fluid

### **Recommended use of the chemical and restrictions on use**

**Identified uses:** Intended as a heat transfer fluid for closed-loop systems. This product is acceptable for use where there is possibility of incidental food contact and as a product for use in the immersion or spray freezing of wrapped meat and packaged poultry products. 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 CANADA ULC  
#2400, 215 - 2ND STREET S.W.  
CALGARY AB T2P 1M4  
CANADA

**Customer Information Number:**

800-258-2436  
SDSQuestion@dow.com

### **EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact (transportation emergencies only):** 1-800-424-9300

**Local Emergency Contact (transportation emergencies only):** 1-800-424-9300

**24-Hour Emergency Contact:** 1-989-636-4400

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## 2. HAZARDS IDENTIFICATION

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### **Hazard classification**

This product is not hazardous under the criteria of the Hazardous Products Regulation (HPR) as implemented under the Workplace Hazardous Materials Information System (WHMIS 2015).

### **Other hazards**

No data available

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

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This product is a mixture.

Component	CASRN	Concentration (w/w)
Propylene glycol	57-55-6	> 95.0 %
Inorganic corrosion inhibitor	not hazardous	< 3.0 %
Water	7732-18-5	< 3.0 %

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#### 4. FIRST AID MEASURES

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##### 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:** Rinse mouth with water. 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.

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#### 5. FIREFIGHTING MEASURES

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##### Extinguishing media

**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..

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**6. ACCIDENTAL RELEASE MEASURES**

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**Personal precautions, protective equipment and emergency procedures:** 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:** 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. Recover spilled material if possible. See Section 13, Disposal Considerations, for additional information.

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**7. HANDLING AND STORAGE**

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**Precautions for safe handling:** No special precautions required. Keep container closed. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

**Conditions for safe storage:** Do not store in: Galvanized steel. Opened or unlabeled containers. Store in original unopened container. 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

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

Consult local authorities for recommended exposure limits.

Component	Regulation	Type of listing	Value
Propylene glycol	US WEEL	TWA	10 mg/m3
	CA ON OEL	TWAEV Total	155 mg/m3 50 ppm
	CA ON OEL	TWAEV	10 mg/m3
	Further information: C: For assessing the visibility in a work environment where 1,2-propylene glycol aerosol is present.		
	CA ON OEL	TWA	155 mg/m3 50 ppm
	CA ON OEL	TWA	10 mg/m3
	Further information: (c): For assessing the visibility in a work environment where 1,2-propylene glycol aerosol is present		
	CA ON OEL	TWA Vapour and aerosols	155 mg/m3 50 ppm
	CA ON OEL	TWA aerosol	10 mg/m3
	Further information: (c): For assessing the visibility in a work environment where 1,2-propylene glycol aerosol is present		

### 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"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Avoid gloves made of: 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

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### Appearance

Physical state	Liquid.
Color	Colorless
Odor	Characteristic
Odor Threshold	No test data available
pH	10.0 50% <i>Literature</i>
Melting point/range	Not applicable to liquids
Freezing point	supercools
Boiling point (760 mmHg)	152 °C <i>Literature</i>
Flash point	<b>closed cup</b> 104 °C <i>Pensky-Martens Closed Cup ASTM D 93</i> (based on major component), Propylene glycol. <b>open cup</b> <i>Cleveland Open Cup ASTM D92</i> None
Evaporation Rate (Butyl Acetate = 1)	<0.5 <i>Estimated.</i>
Flammability (solid, gas)	Not applicable to liquids
Flammability (liquids)	Not expected to be a static-accumulating flammable liquid.
Lower explosion limit	2.6 % vol <i>Literature</i> Propylene glycol.
Upper explosion limit	12.5 % vol <i>Literature</i> Propylene glycol.
Vapor Pressure	2.2 mmHg <i>Literature</i>
Relative Vapor Density (air = 1)	>1.0 <i>Literature</i>
Relative Density (water = 1)	1.05 at 20 °C / 20 °C <i>Literature</i>
Water solubility	<i>Literature</i> completely soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	371 °C <i>Literature</i> Propylene glycol.
Decomposition temperature	No test data available
Kinematic Viscosity	43.4 cSt at 20 °C <i>Literature</i>
Explosive properties	No data available
Oxidizing properties	No data available
Molecular weight	76.9 g/mol <i>Literature</i>

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

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## 10. STABILITY AND REACTIVITY

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**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.

**Incompatible materials:** Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

**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..

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## 11. TOXICOLOGICAL INFORMATION

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

### Information on likely routes of exposure

Ingestion, Inhalation, Skin contact, Eye contact.

**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.

For the major component(s): Propylene glycol.  
LD50, Rat, > 20,000 mg/kg

#### Information for components:

##### Propylene glycol

LD50, Rat, > 20,000 mg/kg

##### Inorganic corrosion inhibitor

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

#### Acute dermal toxicity

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

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

#### Information for components:



**Propylene glycol**

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

**Inorganic corrosion inhibitor**

LD50, Rabbit, > 5,000 mg/kg

**Acute inhalation toxicity**

At room temperature, exposure to vapor is minimal due to low volatility. Mist may cause irritation of upper respiratory tract (nose and throat).

For the major component(s):

LC50, Rat, 4 Hour, vapour, 6.15 mg/l No deaths occurred following exposure to a saturated atmosphere.

**Information for components:**

**Propylene glycol**

LC50, Rabbit, 2 Hour, dust/mist, 317.042 mg/l No deaths occurred at this concentration.

**Inorganic corrosion inhibitor**

Based on information for a similar material: Maximum attainable concentration. LC50, Rat, male and female, 4 Hour, dust/mist, > 0.83 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**

Based on information for component(s):

Prolonged contact is essentially nonirritating to skin.

Repeated contact may cause flaking and softening of skin.

**Information for components:**

**Propylene glycol**

Prolonged contact is essentially nonirritating to skin.

Repeated contact may cause flaking and softening of skin.

**Inorganic corrosion inhibitor**

Prolonged contact may cause slight skin irritation with local redness.

**Serious eye damage/eye irritation**

Based on information for component(s):

May cause slight temporary eye irritation.

Corneal injury is unlikely.

**Information for components:**

**Propylene glycol**

May cause slight temporary eye irritation.

Corneal injury is unlikely.

Mist may cause eye irritation.

**Inorganic corrosion inhibitor**

May cause slight eye irritation.

May cause slight temporary corneal injury.

Dust may irritate eyes.  
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.

**Information for components:**

**Propylene glycol**

Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:  
No relevant data found.

**Inorganic corrosion inhibitor**

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

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.

**Information for components:**

**Propylene glycol**

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

**Aspiration Hazard**

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

**Information for components:**

**Propylene glycol**

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)**

In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

**Information for components:**

**Propylene glycol**

In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

**Inorganic corrosion inhibitor**

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

**Carcinogenicity**

Similar formulations did not cause cancer in laboratory animals.

**Information for components:**

**Propylene glycol**

Did not cause cancer in laboratory animals.

**Inorganic corrosion inhibitor**

No relevant data found.

**Teratogenicity**

For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

**Information for components:**

**Propylene glycol**

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

**Inorganic corrosion inhibitor**

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

**Reproductive toxicity**

For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

**Information for components:**

**Propylene glycol**

In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

**Inorganic corrosion inhibitor**

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

**Mutagenicity**

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

**Information for components:**

**Propylene glycol**

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

**Inorganic corrosion inhibitor**

In vitro genetic toxicity studies were negative.

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## 12. ECOLOGICAL INFORMATION

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*Ecotoxicological information appears 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

#### Inorganic corrosion inhibitor

##### **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, Leuciscus idus (Golden orfe), static test, 48 Hour, > 900 mg/l, Method Not Specified.

### 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

10-day Window: Not applicable

**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)**

Incubation Time	BOD
5 d	69.000 %
10 d	70.000 %
20 d	86.000 %

**Photodegradation**

**Atmospheric half-life:** 10 Hour

**Method:** Estimated.

**Inorganic corrosion inhibitor**

**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.

**Inorganic corrosion inhibitor**

**Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility.

**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.

**Inorganic corrosion inhibitor**

No relevant data found.

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## 13. DISPOSAL CONSIDERATIONS

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**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.

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## 14. TRANSPORT INFORMATION

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### TDG

Not regulated for transport

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

	Not regulated for transport
<b>Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code</b>	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.

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## 15. REGULATORY INFORMATION

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### Canadian Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

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## 16. OTHER INFORMATION

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### Hazard Rating System

#### NFPA

Health	Flammability	Instability
0	1	0

### Revision

Identification Number: 11045208 / A208 / Issue Date: 12/16/2019 / Version: 8.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

### Legend

CA ON OEL	Canada. Ontario OELs
TWA	8-hr TWA
TWAEV	time-weighted average exposure value
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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; HMIS - Hazardous Materials Identification System; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance 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

### 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 CANADA ULC 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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