IMPORTANT FOR FUTURE REFERENCE

Please complete this information and retain this manual for the life of the equipment:

Model #: _____

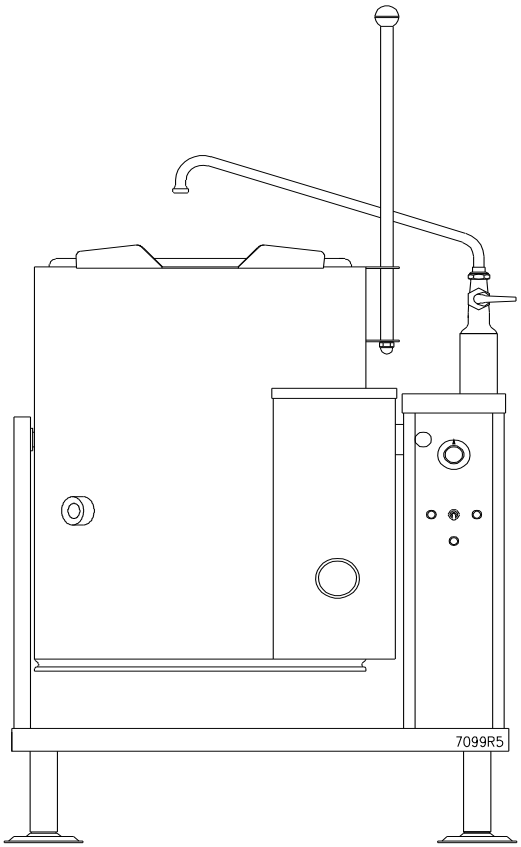
Serial #: _____

Date Purchased: _____

INSTALLATION & OPERATION MANUAL

Gas Fired Steam Jacketed Tilting Kettle

GC-12



⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

CROWN FOOD SERVICE EQUIPMENT

A Middleby Company

70 Oakdale Road, Downsview (Toronto) Ontario, Canada, M3N 1V9

Telephone: 919-762-1000 www.crownsteamgroup.com

Printed in Canada

MANUAL 10105R6

1.0 IMPORTANT NOTES FOR INSTALLATION AND OPERATION

	**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

	**WARNING: Improper installation, operation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing, operating or servicing this equipment.**

	**FOR YOUR SAFETY: Do not store or use gasoline or other flammable vapours or liquids in the vicinity of this or any other appliance.**

This manual should be retained for future reference.

PURCHASER: Instructions to be followed in te event that the operator of this appliance smells gas must be posted in a prominent location. This information shall be obtained by consulting the local gas supplier.

Keep the appliance area free and clear from combustibles.

Do not obstruct the flow of combustion and ventilation air.

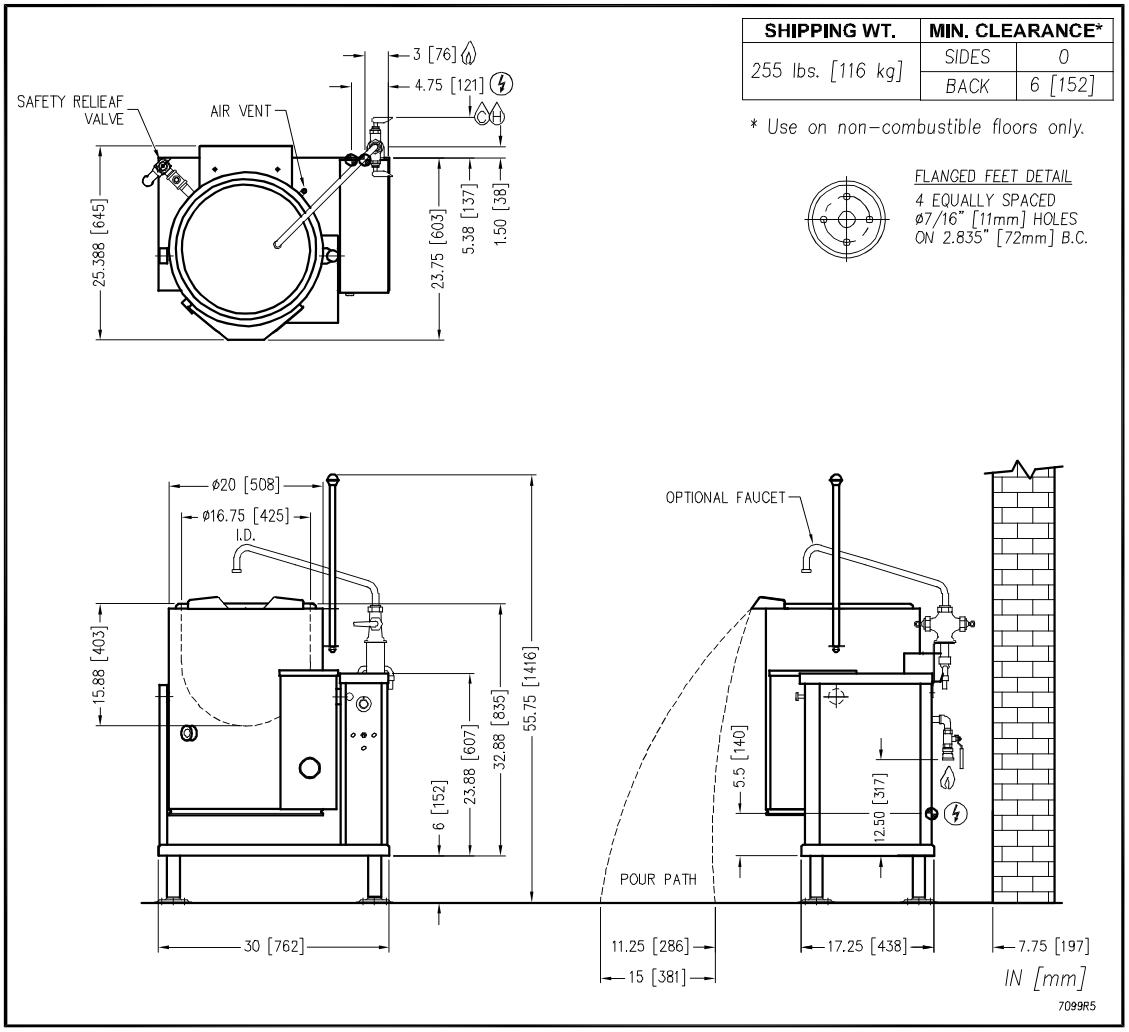
Adequate clearances must be maintained for servicing and proper operation.

Intended for commercial use only. Not for household use.

TABLE OF CONTENTS

2.0 SERVICE CONNECTIONS

MODEL	SERVICE CONNECTIONS	BTU/HR.	kW/HR.
GC-12	Ⓔ – Unless otherwise specified, Field Wire Electrical Connection to be 120 Volts, 60 Hz. single phase with grounding wire. Unit furnished with 8' cord and 3 prong plug. Total max. amps 2.0. Ⓖ – GAS CONNECTION: Supply gas through 3/4" pipe. NATURAL 6" – 14" W.C. (152mm – 355mm W.C.) PROPANE 12" – 14" W.C. (305mm – 355mm W.C.) Contact manufacturer for installation over 2,000 ft. elevation. Ⓒ – COLD WATER: 3/8" O.D. tubing to faucet (OPTIONAL) Ⓗ – HOT WATER: 3/8" O.D. tubing to faucet (OPTIONAL)	43,000	12.6



As continued product improvement is a policy of Crown, specifications are subject to change without notice.

3.0 INTRODUCTION

DESCRIPTION

Model GC-12 (12 gallon capacity) gas fired, self-contained, tilting kettle. The kettle has a jacket of double-wall construction forming a sealed reservoir around the lower two-thirds of the kettle. The reservoir is charged with distilled water. The kettle is equipped with a “clean lock” to hold kettle in cooking position or tilted 105 degrees for ease of cleaning. The kettle is also equipped with automatic ignition, low water cut off and tilt switch, which, when activated, shuts down the burner.

BASIC FUNCTION

The kettle operates by generating steam in the kettle reservoir. The sequence of operation is as follows:

1. Operator turns the power switch to the on position and sets the temperature control dial to the desired setting.

2. The red light comes on indicating the kettle is heating. The green “IGNITION” light comes on indicating that the ignition and burner are active.

3. Once the kettle reaches the set temperature, the red “TEMPERATURE” light and the green “IGNITION” light extinguish.

4. All kettles are supplied with sufficient water in the jacket. If for any reason the water level falls below the required amount to operate the kettle, the burner shuts down and the amber light comes on. See Adding Water in Service section.

5. The sight glass indicates the water level within the kettle jacket.

6. The relief valve is a safety feature which prevents the internal kettle pressure from exceeding 50 PSI. It should never be tampered with.

4.0 INSTALLATION INSTRUCTIONS

INSTALLATION CODES AND STANDARDS

Installation must conform with local codes, or in the absence of local codes, with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, or the *Natural Gas and Propane Installation Code, CSA B149.1*, as applicable.

1. The appliance and its individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of ½ psi (3.5 kPa).

2. The appliance must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ psi (3.5 kPa).

Electrical grounding must be provided in accordance with local codes, or in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical Code, CSA C22.2, as applicable.

Ventilation must be provided in accordance with local codes, or in the absence of local codes, with *ANSI/NFPA 96 Standard for Ventilation and Fire Protection of Commercial Cooking Operations*.

	**WARNING: ELECTRICAL GROUNDING INSTRUCTIONS** **This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug. (120V units only).**

The electrical wiring diagram is located inside the right hand console of the appliance.

GAS CONNECTION

	**WARNING: Do not connect the appliance to the electrical supply until after the gas connection has been made.**

	**CAUTION: The pipe thread compound used when installing pipes must be a type that is resistant to the action of liquified petroleum or propane gases.**

1. The Serial and Rating Plate on the unit indicates the type of gas your unit is equipped to burn. DO NOT connect to any other gas type.

2. A 3/4" NPT line is provided at rear for the connection. The unit is equipped with an internal pressure regulator which is set at 4" W.C. manifold pressure for Natural Gas and 10" W.C. for Propane Gas. Use 1/8" pipe tap on the union elbow assembly located in the console for checking pressure.

An adequate gas supply is imperative. Undersized or low pressure lines will restrict the volume of gas required for satisfactory performance. A steady supply pressure, minimum 6 inch W.C. for natural gas and minimum 12 inch W.C. for propane gas is recommended. With all units operating simultaneously, the manifold pressure on all units should not show any appreciable drop. Fluctuations of more than 25% on natural gas and 10% on propane gas will create problems, affecting burner operation. Contact you gas company for correct supply line sizes.

Purge the supply line to clean out any dust, dirt or other foreign matter before connecting the line to the unit. Use pipe joint compound which is suitable for use with L.P. on all threaded connections.

Test pipe connections thoroughly for gas leaks.

	**WARNING: Never use an open flame to check for gas leaks. Check all connections for leaks using soapy water before use.**

NOTICE: If this equipment is being installed at over 2,000 feet altitude and was not so specified on order, contact service department. Failure to install with proper orifice sizing may void the warranty.

INSTALLATION

1. Uncrate carefully. Report any hidden freight damage to the freight company immediately.

2. Ideally an exhaust system should be directly above the appliance to exhaust combustion gases generated by the unit.

3. The appliance is intended for use on noncombustible floors. The minimum clearance from combustible and noncombustible floor construction is 0" on right side, 0" on left side and 6" (152 mm) from the back of the flue chimney.

4. Appliance location must allow air supply to unit and obstruction free clearance for air opening into the combustion chamber.

5. Set the appliance in place and level using spirit level. Level left to right and front to back.

6. Mark hole locations on the floor through the anchoring holes provided in the flanged adjustable feet.

7. Remove the appliance from installation position and drill holes in locations marked on the floor. (See installation diagram on Page 4). Insert proper anchoring devices. (Not supplied).

8. Place appliance back in the installation position and Re-level left to right and front to back.

9. Bolt and anchor appliance securely to the floor.

10. Seal bolts and flanged feet with silastic or equivalent compound.

11. Make service connections as indicated.

12. The pressure relief valve is located at the left rear of the unit. This area should be kept clear and should not be in an area where operators will normally stand. The elbow on the relief valve should be turned toward the floor. 3/4" diameter pipe may be used to extend to the floor, but must not be piped directly to a drain. It must be vented to the atmosphere.

13. Check the pressure gauge on the front panel before operating. The reading should be in the green vacuum zone (below 0 PSI). See “Re-establishing Vacuum” section under Service Instructions.

5.0 OPERATING INSTRUCTIONS

FRONT PANEL CONTROLS:

Power Switch

This switch turns the main power to the unit on and off. It must be turned on to heat the kettle. It should be turned off when the kettle will not be in use for long periods.

Thermostat

Selects the desired internal kettle operating temperature. It also turns on the temperature light (red) and ignition light (green).

Temperature Pilot Light (Red)

When the kettle has reached set temperature, temperature light (red) will go off.

Ignition Pilot Light (Green)

Comes on with temperature light (red) and indicates ignition has occurred. Should it not come on with temperature light, this would indicate failed ignition or burnt out light.

Low Water Light (Amber)

All kettles are supplied with sufficient water in the pressurized jacket. If at any time the water level falls below that required for proper operation, the kettle will not heat and this light will come on. See “Adding Water” section of service instructions.

Pressure Gauge

The pressure gauge indicates the internal operating pressure of the kettle.

Sight Glass

The sight glass indicates the water level within the kettle jacket.

Pressure Relief Valve

The pressure relief valve is a safety device which prevents the internal kettle pressure from exceeding 50 psi. It should never be tampered with.

TILTING INSTRUCTIONS

Your kettle has the standard “Clean Lock” feature and may not be tilted without disengaging the tilt knob located on the console at the top left. This feature locks the kettle in the upright position and also allows the operator to lock the kettle at 105 degrees for ease of cleaning. Follow these steps to tilt kettle:

1. Pull out the tilt knob at the top left of console.

2. Using kettle tilt handle, pull kettle forward to desired angle of pour or until kettle locks at 105 degrees. The tilt knob can be released after the kettle has been tilted approximately 10 degrees.

3. Kettle will lock in position at 105 degrees and may be tilted further by pulling the tilt lock knob a second time allowing the kettle to tilt the full distance.

4. To return the kettle to the upright position, pull out the tilt lock knob and tilt the kettle upward until it locks in the upright position. The kettle should not move in either direction once in the upright position.

LIGHTING

1. Ensure the kettle is in the upright position.

2. Open the manual gas shut off valve located at the back of the right-hand console when facing the front of the unit.

3. Set the thermostat dial in off position. Turn the power switch on.

4. Set the thermostat to desired setting. NOTE: Ignition may not occur at a setting below 2 - 3 on thermostat dial. If ignition light does not stay on, turn off thermostat. Wait five minutes and repeat the lighting procedure.

	**WARNING: In the event of main burner ignition failure, a 5 minute purge period must be observed prior to re-establishing ignition source.**

SHUT DOWN

1. Turn thermostat dial to “OFF” position.

2. Turn power switch to “OFF” position.

3. Close manual gas shut-off valve.

6.0 CLEANING INSTRUCTIONS

	**WARNING: Disconnect the power supply to the appliance before cleaning or servicing.**

	**WARNING: Never spray water into electric controls or components!**

	**CAUTION: The equipment and its parts are hot. Use care when operating, cleaning and servicing.**

	**CAUTION: Do not use cleaning agents that are corrosive.**

Your kettle should be cleaned immediately after each use or when cooking a different product. Before cleaning, check that the kettle has cooled enough to touch it.

1. Rinse the inside of the kettle thoroughly and drain to remove any food particles.

2. Using a nylon brush, clean the kettle with a mild detergent ad water. Never use steel wool or scouring powder as it will scratch stainless steel. Plain steel wool can leave small pieces of steel which can rust.

3. Rinse the inside of the kettle thoroughly with clean water. Drain the kettle by tilting, to allow the detergent and water solution to drain.

4. Wipe the exterior of the kettle with a clean, damp cloth.

WHAT TO DO IF SURFACE RUST APPEARS

Metal utensils should never be used as they will scratch the surface of the equipment and rust may begin to form. To remove surface accumulation of rust from the inadvertent use of such utensils, the following procedure may be used.

	**CAUTION: Improper use of this procedure may damage your appliance!**

1. Use undiluted white vinegar with a non-abrasive scouring pad (plastic) or cloth on the affected area to remove the rust stain. The appliance should not be heated and remain at room temperature during the entire cleaning process.

2. If the stain resists removal, additional exposure time with vinegar may be required, to a maximum of one hour.

3. Thoroughly wash all of the vinegar away with fresh clear water. Dry the surface completely and allow one hour before using the appliance to cook.

Following daily and period maintenance procedures will prolong the life of your equipment. Climatic conditions - salt air - may require more thorough and frequent cleaning or the life of the equipment could be adversely affected.

STAINLESS STEEL

To remove normal dirt, grease or product residue from stainless steel, use ordinary soap and water (with or without detergent) applied with a sponge or cloth. Dry thoroughly with a clean cloth. Never use vinegar or any other corrosive cleaner.

To remove grease and food splatters or condensed vapours that have baked on the equipment, apply cleanser to a damp cloth or sponge and rub cleanser on the metal in the direction of the polishing lines. Rubbing cleanser as gently as possible in the direction of the polished lines will not mar the finish of the stainless steel. NEVER RUB WITH A CIRCULATION MOTION.

Soil and burn deposits which do not respond to the above procedure can usually be removed by rubbing the surface with **SCOTCH-BRITE™** scouring pads or STAINLESS scouring pads. **DO NOT USE ORDINARY STEEL WOOL** as any particles left on the surface will rust and further spoil the appearance of the finish. **NEVER USE A WIRE BRUSH, STEEL SCOURING PADS (EXCEPT STAINLESS), SCRAPER, FILE OR OTHER STEEL TOOLS.** Surfaces which are marred collect dirt more rapidly and become more difficult to clean. Marring also increases the possibility of corrosive attack. Refinishing may then be required.

WHAT TO DO IF SURFACE RUST APPEARS (Continued)

TO REMOVE HEAT TINT: Darkened areas sometimes appear on stainless steel surfaces where the area has been subjected to excessive heat. These darkened areas are caused by thickening of the protective surface of the stainless steel and is not harmful. Heat tint can normally be removed by the foregoing, but tint which does not respond to this procedure calls for a vigorous scouring in the direction of the polish lines using **SCOTCH-BRITE™** scouring pads or a **STAINLESS** scouring pad in combination with a powdered cleanser. Heat tint action may be lessened by not applying or by reducing heat to equipment during slack periods.

All food contact surfaces must be thoroughly drained and flushed prior to cooking in the kettle.

CONTROL PANEL: The textured control panel should be cleaned with warm water and mild soap. Never use an abrasive cloth or steel wool . Never use cleaning solvents with a hydrocarbon base.

7.0 PERIODIC MAINTENANCE

SAFETY VALVE MAINTENANCE AND TESTING

	**CAUTION! Under normal operating conditions a "try lever test" should be performed every two months. Under severe service conditions, or if corrosion and/or deposits are noticed within the valve body, testing must be performed more often. A "try lever test" should also be performed at the end of any non-service period.**

	**CAUTION! Hot, high pressure fluid may be discharged from body drain and vent during "try lever" test. Care must be taken to avoid any bodily contact.**

	**CAUTION! High sound levels may be experienced during "try lever" test. Wear proper safety equipment and exercise extreme care! Test at, or near, half of the operating pressure by holding the test lever fully open for at least two seconds to flush the valve seat free of sediment and debris. Then release lever and permit the valve to snap shut.** **If lift lever does not activate, or there is no evidence of discharge, turn off equipment immediately and contact a licensed contractor or qualified service personnel.**

8.0 SERVICE

GENERAL

NOTICE: Contact the factory, the factory representative or local service company to perform maintenance and repairs.

In order to avoid problems, check that the unit has been connected to the gas supply type and voltage for which it was supplied. This can be done by examining the rating plate that lists the gas type and voltage for which the unit was manufactured.

PRESSURE SWITCH

The pressure switch is preset for proper operation from the factory and should not be adjusted until it is determined to be the cause of an operating pressure deficiency.

Appliance malfunctions caused by pressure switch misadjustment are:

1. Pressure relief valve opening, especially on preheat from a cold start to 285 °F (pressure switch set too high.)

2. Burners being shut down prematurely by the pressure switch (pressure switch set is too low).

If adjustment of pressure switch is required, call a qualified service technician to service the unit.

SERVICE TECHNICIAN:

1. Bypass the thermostat by removing the wire on terminal 8 and install on piggy back on terminal 10. Ignition and temperature light will come on.

2. Turn on unit and allow it to reach approximately 35 psi. Rotate knob on pressure switch clockwise to increase, counterclockwise to decrease. Use centre of black ring as an indicator until burner shuts off at 35 psi as shown on pressure gauge on front of unit.

3. To check that the pressure switch operates, cool the kettle down by filling with cold water. Once cooled, turn kettle back on. Burner should shut down at 35 psi.

4. Turn off power and cool unit down so that pressure on gauge is below 30 psi.

5. When pressure is below 30 psi, reconnect the thermostat into circuit and set thermostat dial to maximum setting.

6. Turn on power and allow pressure to reach 30 psi on the pressure gauge.

7. Thermostat must shut off at 30 psi. Should it fail to do this, adjustment will be required.

8. To set thermostat, adjust the trim-pot on the control inside the kettle. It is located next to terminal 2 and is not sealed. Turning pot clockwise will lower the temperature setting, counterclockwise increases temperature.

9. To check that the thermostat operates correctly, cool the unit as before and turn thermostat dial to maximum setting. Burner should ignite and cycle between 22 and 30 psi.

10. If vacuum has been lost, heat unit until 30 psi, and open vent nut to release pressure in order to create vacuum. When ignition and temperature lights come on, between 22 to 24 psi, close vent nut and allow to build pressure.

11. Unit is now ready for operation.

ADDING WATER

When the “Low Water” light is on, additional water is required and the following steps must be followed:

1. Unit should be completely cold and off.

2. Lift handle of pressure relief valve to release the remaining vacuum in the kettle (relief valve is at left rear of kettle).

ADDING WATER (Continued)

3. Remove air vent nut on the elbow located at the rear right of the unit.

4. Using pure distilled water only, pour the water into the opening (a funnel will be helpful). Water will enter the kettle slowly, as air must escape through the same hole. Water should be added until the water level is past the centre of the sight glass. The sight glass is located on the lower front left of the kettle.

5. When sufficient water has been added, replace and tighten the nut. Be sure to seal threads with pipe joint compound suitable for steam at 50 psi.

6. Vacuum must be re-established. See Re-establishing Vacuum).

RE-ESTABLISHING VACUUM

Periodically check pressure gauge when kettle is cold. It should be in green vacuum zone (below 0 psi). Otherwise air is present and proper heating will not occur.

To remove air:

1. With the kettle empty, turn the thermostat knob to the highest temperature.

2. When the temperature pilot light goes off, open air vent nut one (1) full turn for 20 seconds and then close and tighten the nut. This should remove the air and any loss in performance should return.

3. Proper vacuum in the kettle should now be re-established.

9.0 TROUBLESHOOTING

Unit does not come on:

1. Power switch and/or thermostat is “OFF”.
2. Unit is not plugged in.
3. Main power supply is off.
4. Tilt micro switch out of alignment or faulty.

Unit is on electrically but does not heat:

1. Gas supply to the unit is “OFF”.
2. The manual shut-off valve is “OFF”.
3. The thermostat is not turned “ON.”
4. The kettle is not in the upright position.
5. The electronic ignition is not functioning.
6. Pressure switch is not functioning.
7. Low water in kettle jacket.
8. Thermostat is not functioning.

Unit is slow to preheat and slow to recover:

1. Wrong size orifices.
2. Wrong gas supply.
3. Incorrect pressure at supply.
4. Loss of vacuum.

NOTICE: Contact the factory, the factory representative or local service company to perform maintenance and repairs.

APPENDIX 'A'

MATERIAL SAFETY DATA SHEET

PREPARATION INFORMATION:

Prepared for use in Canada by: E H & S Product Regulatory Management Department
DOW CHEMICAL CANADA INC.
P.O. Box 1012
Sarnia, Ontario, N7T 7K7

(800) 331-6451

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

IN CASE OF EMERGENCY: Fort Saskatchewan, Alberta: (780) 998-8282
Sarnia, Ontario: (519) 339-3711
Varennes, Quebec: (450) 652-1000

Product: **DOWFROST* HD HEAT TRANSFER FLUID, DYED**

Product Code: 04632

Effective Date: 2/20/01 Date Printed: 07/10/02 MSD: 002239

DOW CHEMICAL CANADA INC.
P.O. Box 1012
Sarnia, Ontario, N7T 7K7

Prepared for use in Canada by the E H & S Product Regulatory Management Department; Phone: (800) 331-6451.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Propylene Glycol	CAS# 000057-55-6	94%
Dipotassium Phosphate	CAS# 007758-11-4	<5%
Deionized Water	CAS# 007732-18-5	<5%

** or (R) indicates a trademark of The Dow Chemical Company.*

MATERIAL SAFETY DATA SHEET

Product: DOWFROST* HD HEAT TRANSFER FLUID, DYED
Product Code: 04632
Effective Date: 02/20/01, Date Printed: 07/10/02, MSD: 002239

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear yellow liquid. Odourless. Avoid temperatures above 450°F, 232°C.

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)

EYE: May cause slight transient (temporary) eye irritation. Corneal injury is unlikely. Mists may cause eye irritation.

SKIN CONTACT: Prolonged contact is essentially nonirritating to skin. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated exposures may cause flaking and softening of skin.

INGESTION: Single dose oral toxicity is considered to be extremely low. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: At room temperature, vapours are minimal due to physical properties. Mists may cause irritation of upper respiratory tract (nose and throat).

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive exposure to propylene glycol may cause central nervous system effects.

CANCER INFORMATION: Did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

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4. FIRST AID

EYES:	Flush eyes with plenty of water.
SKIN:	Wash off in flowing water or shower.
INGESTION:	No adverse effects anticipated by this route of exposure incidental to proper industrial handling.
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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 214°F, 107°C (based on a similar material)

METHOD USED: PMCC

AUTOIGNITION TEMPERATURE: NOT DETERMINED

FLAMMABILITY LIMITS

LFL: Not determined

UFL: Not determined

HAZARDOUS COMBUSTION PRODUCTS: During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to carbon monoxide and carbon dioxide.

OTHER FLAMMABILITY INFORMATION: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Flammable concentrations of vapour can accumulate at temperatures above 214°F. Liquid mist of this product can burn. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. Container may rupture from gas generation in a fire situation.

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EXTINGUISHING MEDIA: Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream. May spread fire.

MEDIA TO BE AVOIDED: Do not use direct water stream.

FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discolouration of the container. Move container from fire area if this is possible without hazard.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, 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 (See Section 15 for Regulatory Information.)

PROTECT PEOPLE: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls/ Personal Protection.

PROTECT THE ENVIRONMENT: Avoid contamination of all waterways.

CLEAN-UP: See Section 13, Disposal Consideration.

7. HANDLING AND STORAGE

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: No special handling requirements data available.

HANDLING: See Section 8, Exposure Controls/Personal Protection.

STORAGE: See Section 10, Stability and Reactivity.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Use safety glasses. Safety glasses should be sufficient for most operations; however, for misty operations wear chemical goggles.

SKIN PROTECTION: Use gloves impervious to this material.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. In misty atmospheres, use an approved mist respirator.

EXPOSURE GUIDELINES: Propylene glycol: AIHA WEEL is 50 ppm total, 10 mg/m3 aerosol only.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Clear yellow liquid.
ODOUR:	Odourless
VAPOUR PRESSURE:	0.22 mmHg @ 20°C
VAPOUR DENSITY:	2.6
BOILING POINT:	320°F, 160°C
SOLUBILITY IN WATER/MISCIBILITY:	Complete
SPECIFIC GRAVITY OR DENSITY:	1.058 @ 25/25°C

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Thermally stable at typical use temperatures.

CONDITIONS TO AVOID: Avoid use temperatures above 450°F, 232°C. Product can degrade at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with oxidizing materials. Avoid contact with strong acids

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HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION (See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1).

SKIN: The LD50 for skin absorption in rabbits is >10,000 mg/kg.

INGESTION: The oral LD50 for rats is 20,000 - 34,000 mg/kg.

MUTAGENICITY: In vitro mutagenicity studies were negative. Animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION (For detailed Ecological data, write or call the address or non-emergency number shown in Section 1.)

ENVIRONMENTAL FATE

MOVEMENT AND PARTITIONING: Based largely or completely on data for major component(s). Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

DEGRADATION AND PERSISTENCE: Based largely or completely on data for major component(s). Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Degradation is expected in the atmospheric environment within minutes to hours.

ECOTOXICITY: Based largely or completely on data for major component(s). Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in most sensitive species).

** or (R) indicates a trademark of The Dow Chemical Company.*

MATERIAL SAFETY DATA SHEET

Product: DOWFROST* HD HEAT TRANSFER FLUID, DYED
Product Code: 04632
Effective Date: 02/20/01, Date Printed: 07/10/02, MSD: 002239

13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information.)

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. All disposal methods 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. THE DOW CHEMICAL COMPANY HAS 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 2 (Composition/Information On Ingredients).

FOR UNUSED AND UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Centre at 800-258-2436 or 989-832-1556 for further details.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.): For D.O.T. regulatory information, if required, consult transportation regulations, product shipping papers, or contact your Dow representative.

CANADIAN TDG INFORMATION: For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your Dow representative.

15. REGULATORY INFORMATION (Not meant to be all-inclusive – selected regulations represented).

NOTICE: The information herein is presented 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 from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

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U.S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
1, 2-Propanediol	000057-55-6	PA1

PA1= Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD:

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

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MATERIAL SAFETY DATA SHEET

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CANADIAN REGULATIONS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

This product is not a “Controlled Product” under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL). Contact your Dow representative for more information.

16. OTHER INFORMATION

MSDS STATUS: Revised to 16 section format.

The information herein is given in good faith, but no warranty, express or implied, is made. Consult The Dow Chemical Company for further information.

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