



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

Self-Generating Steam Full Jacketed Kettles

KELS-20F, KELS-30F, KELS-40F and KELS-60F
KEPS-20F, KEPS-30F, KEPS-40F and KEPS-60F



Model KELS-60F



Model KEPS-60F

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.

SOUTHBEND STEAM

 **MIDDLEBY** A Middleby Company

1100 Old Honeycutt Road Fuquay-Varina, North Carolina 27526 USA

www.southbendnc.com



SAFETY PRECAUTIONS

Before installing and operating this equipment, be sure everyone involved in its operation is fully trained and aware of precautions. Accidents and problems can be caused by failure to follow fundamental rules and precautions.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or to the equipment.



This symbol warns of immediate hazards that will result in severe injury or death.



This symbol refers to a potential hazard or unsafe practice that could result in injury or death.



This symbol refers to a potential hazard or unsafe practice that could result in injury, product damage, or property damage.

NOTICE

This symbol refers to information that needs special attention or must be fully understood, even though not dangerous.

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.



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NOTICE

Contact the factory, the factory representative or a local service company to perform maintenance and repairs should the appliance malfunction. Refer to warranty terms.

NOTICE

This product is intended for commercial use only. NOT FOR HOUSEHOLD USE.

NOTICE

This manual should be retained for future reference.

RETAIN THIS MANUAL FOR FUTURE REFERENCE.

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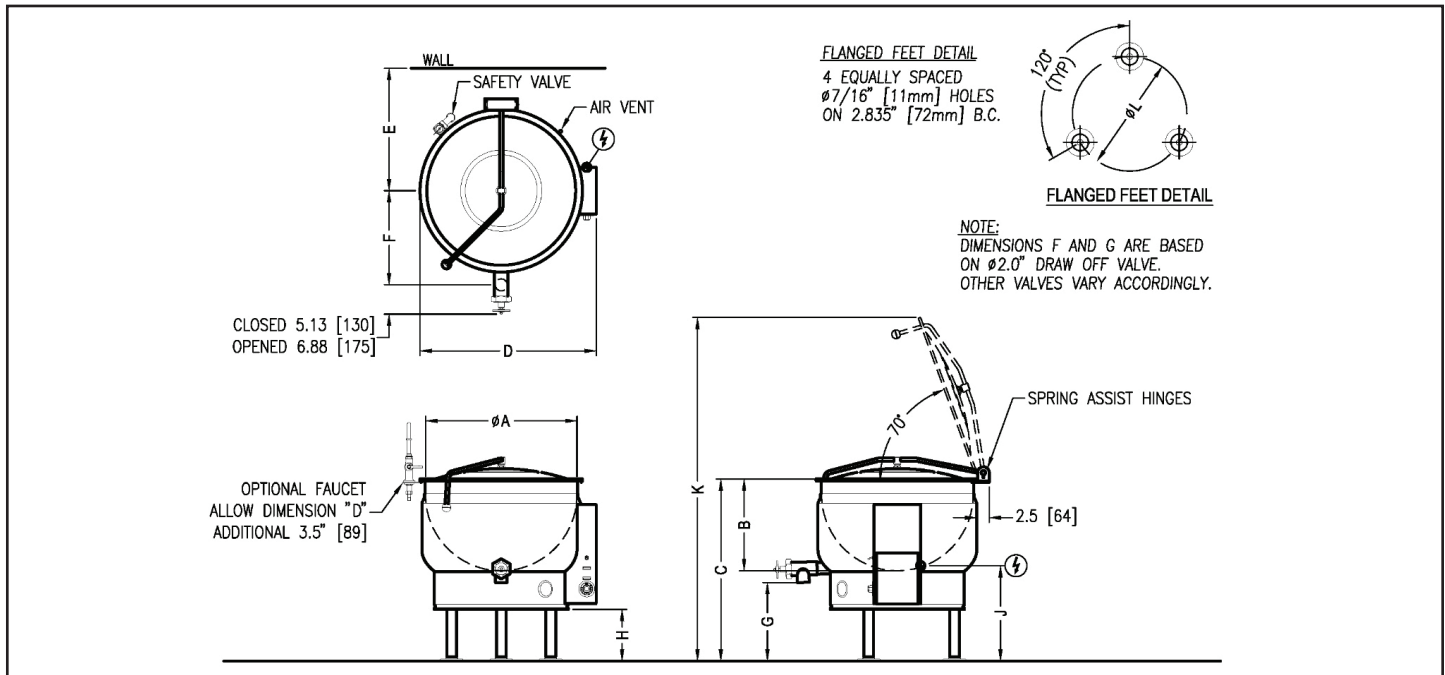
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SERVICE CONNECTIONS



SERVICE CONNECTIONS

⚡ – ELECTRICAL CONNECTION : To be as specified on data plate.

DIMENSIONS

MODEL	CAPACITY	UNITS	A	B	C	D	E	F	G	H	J	K	L
KELS-20F	20 gallons (76 liters)	in (mm)	26" (660)	15.75" (400)	31.25" (794)	30.25" (768)	21" (533)	16.13" (410)	13.5" (343)	8.88" (225)	16.38" (416)	59" (1499)	19.63" (498)
KELS-30F	30 gallons (114 liters)	in (mm)	29.5" (749)	17.5" (445)	33.5" (851)	33.75" (857)	20.63" (524)	18" (457)	14" (356)	9.63" (244)	17.13" (435)	64.38" (1635)	22.88" (581)
KELS-40F	40 gallons (152 liters)	in (mm)	33" (838)	19.25" (489)	36.25" (921)	37" (940)	22.38" (568)	19.5" (495)	14.88" (378)	11.25" (286)	18.75" (476)	70.5" (1791)	26" (660)
KELS-60F	60 gallons (227 liters)	in (mm)	35.5" (902)	20.5" (521)	38.5" (978)	40" (1016)	23.63" (600)	21.5" (546)	15" (381)	13" (330)	20.5" (521)	75.13" (1908)	29.13" (740)

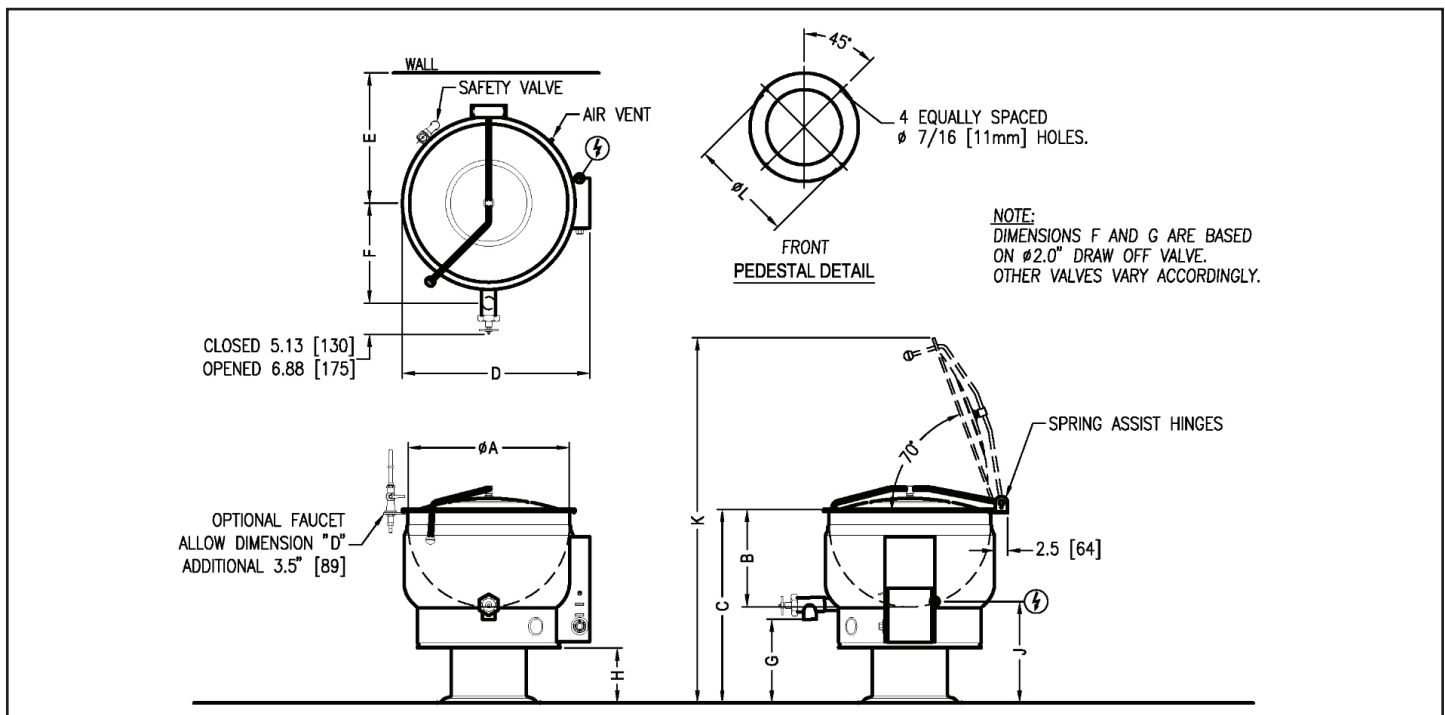
ELECTRICAL CHARACTERISTIC

AVAILABLE kW			AMPS PER LINE								
MODEL	STANDARD	OPTIONAL	kW	PHASE	208V	220V	240V	380V	415V	480V	600V
KELS-20F	18	24	18	1	86.5	81.8	75.0	N/A	N/A	N/A	N/A
KELS-30F	18	24 or 33		3	50	47.2	43.3	27.3	25	21.6	17.3
KELS-40F	18	24 or 33	24	3	66.6	62.9	57.7	36.4	33.3	28.8	23.1
KELS-60F	24	33	33	3	91.6	86.6	79.4	50.1	45.9	39.7	31.7

SPECIFICATIONS

MODEL	kW	CAPACITY		MODEL	SHIPPING WEIGHT	MINIMUM CLEARANCE	
KELS-20F	12	20 Gallon	76 Liter	KELS-20F	245 lbs. [111 kg]	SIDES BACK	3" [76 mm] 3" [76 mm]
KELS-30F	15	30 Gallon	114 Liter	KELS-30F	375 lbs. [170 kg]		
KELS-40F	18	40 Gallon	152 Liter	KELS-40F	420 lbs. [191 kg]		
KELS-60F	24	60 Gallon	227 Liter	KELS-60F	460 lbs. [209 kg]		

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



SERVICE CONNECTIONS

⚡ – ELECTRICAL CONNECTION : To be as specified on data plate.

DIMENSIONS

MODEL	CAPACITY	UNITS	A	B	C	D	E	F(2")	F(3")	G(2")	G(3")	H	J	K
KEPS-20	20 gallons (76 liters)	in (mm)	21" (533)	18" (457)	38" (965)	25.25" (641)	18.5" (470)	14.75" (375)	15.5" (394)	18" (457)	17.13" (435)	13.38" (340)	20.75" (527)	60.5" (1537)
KEPS-25	25 gallons (95 liters)	in (mm)	21 (533)	21.25 (540)	37.25 (946)	25.25 (641)	18.5 (470)	14.75 (375)	15.5 (394)	14.12 (358)	13.13 (333)	9.5 (241)	17 (432)	58.75 (1492)
KEPS-30	30 gallons (114 liters)	in (mm)	24" (610)	20" (508)	38" (965)	28.25" (718)	20" (508)	16" (406)	16.5" (419)	15.75" (400)	15" (381)	11.25" (286)	18.88" (479)	63.5" (1613)
KEPS-40	40 gallons (152 liters)	in (mm)	26" (660)	22.5" (572)	38" (965)	30.25" (768)	21" (533)	17" (432)	18" (457)	13.5" (343)	13.5" (343)	8.88" (225)	16.38" (416)	65" (1651)
KEPS-60	60 gallons (227 liters)	in (mm)	29.5" (749)	26" (660)	42" (1067)	33.75" (857)	20.63" (524)	18" (457)	19.25" (489)	13.88" (352)	12.88" (327)	9.63" (244)	17.13" (435)	75" (1905)
KEPS-80	80 gallons (303 liters)	in (mm)	33" (838)	28" (711)	45" (1143)	37" (940)	22.38" (568)	19.5" (495)	20.5" (521)	14.88" (378)	13.88" (352)	11.25" (286)	18.63" (473)	81" (2058)
KEPS-100	100 gallons (379 liters)	in (mm)	35.5" (902)	30" (762)	48" (1219)	40" (1016)	23.63" (600)	21.5" (546)	22.5" (572)	15" (381)	14.5" (368)	13" (330)	20.5" (521)	87" (2210)

ELECTRICAL CHARACTERISTIC

AVAILABLE kW			AMPS PER LINE								
MODEL	STANDARD	OPTIONAL	kW	PHASE	208V	220V	240V	380V	415V	480V	600V
KEPS-20F	18	24	18	1	86.5	81.8	75.0	N/A	N/A	N/A	N/A
KEPS-30F	18	24 or 33		3	50	47.2	43.3	27.3	25	21.6	17.3
KEPS-40F	18	24 or 33	24	3	66.6	62.9	57.7	36.4	33.3	28.8	23.1
KEPS-60F	24	33	33	3	91.6	86.6	79.4	50.1	45.9	39.7	31.7

SPECIFICATIONS

MODEL	kW	CAPACITY		MODEL	SHIPPING WEIGHT	MINIMUM CLEARANCE	
KEPS-20F	18	20 Gallon	76 Liter	KEPS-20F	245 lbs. [111 kg]	SIDES BACK	3" [76 mm] 3" [76 mm]
KEPS-30F	18	30 Gallon	114 Liter	KEPS-30F	375 lbs. [170 kg]		
KEPS-40F	18	40 Gallon	152 Liter	KEPS-40F	420 lbs. [191 kg]		
KEPS-60F	24	60 Gallon	227 Liter	KEPS-60F	460 lbs. [209 kg]		

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INTRODUCTION

DESCRIPTION

All electrically powered kettles described and referred to in this manual are pressure vessels of a double-wall construction forming a sealed jacket (chamber) enveloping the kettle bowl surface.

The kettle bowl is the container for the food product which ideally should be a liquid or semi-liquid consistency to achieve complete contact with the bowl surface and thus fully absorb the heat transmitted through that surface from the pressurized steam generated in the kettle jacket.

The jacket is intended to function as a self contained sealed chamber with a permanent solution of water and antifreeze sufficient not only to immerse and thereby protect replaceable electric heating elements, but also provide the steam source during the steam generating process.

The heating elements are thermostatically dial controlled to provide precise temperatures throughout the range from slow simmer to rolling boil.

All stationary kettles are intended to be permanently floor mounted on legs with adjustable flanged feet (KELS models) or pedestals (KEPS models).

All kettles are equipped with a spring assist stainless steel lid covering the kettle bowl opening, a sanitary stainless steel tangent draw-off valve for the removal of the food product from the kettle bowl, and a safety relief valve plumbed to the kettle jacket.

CAPACITIES

All models are suffixed with either - 20F, - 30F, - 40F, or - 60F to indicate the capacity of that kettle in US gallons. Thus an KELS-40F indicates a full jacketed electrically powered steam kettle mounted on legs with a capacity of 40 US gallons.

FUNCTIONING MODE

All electrically powered self steam generating kettles consist of a jacket charged with a solution of water and antifreeze sufficient to completely immerse and protect replaceable electric heating elements.

To minimize tampering, the Safety Valve is plumbed toward the rear of the kettle jacket. Should any component malfunction and cause the pressure in the jacket to reach the rated pressure of the kettle, this protective device will open automatically and release excessive pressurized steam.

When the Power Switch is turned ON and the Temperature Control (Thermostat) Knob dialed simultaneously, TEMPERATURE pilot light will come on and contactors will close to allow power to elements. Steam generation will commence and continue until the water contained in the jacket reaches the thermostatic temperature, manually preselected, at which point the Temperature (thermostat) Control will de-energize and open the contactors cutting off power to heating elements and TEMPERATURE pilot light will go off. When the temperature of the water in the jacket drops slightly, the cycle will repeat itself thus making it possible to maintain any selected precise cooking mode temperature.

The temperature required for the cooking process to function adequately must be greater than the boiling point of the liquid food product. Further, the higher the temperature, the greater the steam pressure attained in the jacket and consequently the quicker the cooking process. For example, steam pressurized at 30 p.s.i. attains a temperature of 274° Fahrenheit.

Since air is an unsuitable media through which heat may be transferred, it has been removed from the kettle jacket during testing at the factory. The Pressure Gauge should indicate vacuum in the jacket, in the green vacuum zone on the gauge (approximately 20 to 25 inches Hg), when the kettle is cold or has been inoperative for some time. The kettle jacket is intended to function at all times as a completely sealed self-contained chamber and it is especially advisable not to trip the safety relief valve during inoperative periods since this will break the vacuum seal and allow air to enter the kettle jacket.

It should be noted that Temperature Controls (thermostats) used on these particular kettles have an ultimate high limit temperature and this setting will prevent the heating elements from ever generating steam pressure to reach or exceed the rated working pressure of these kettles. Further should the Temperature Control fail, an unlikely condition, and consequently the circuit to the heating elements remain energized, the Safety Valve will blow and release steam (i.e., water) from the self contained sealed kettle jacket and consequently lower the water level in the jacket. A Safety Probe is incorporated in the circuit to sense depletion of the water level in the kettle jacket and will not only activate the LOW WATER level indicator pilot light but also signal the Liquid Level Control to switch off power and de-energize the circuit to the heating elements (preventing element burn outs) until the water level is adequately replenished.

INSTALLATION

UNPACKING

IMMEDIATELY INSPECT FOR SHIPPING DAMAGE

Immediately after unpacking, check for possible shipping damage. If the kettle is found to be damaged, save the packaging material and contact the carrier within 15 days of delivery.

Before installing, verify that the electrical service agrees with the specifications on the rating plate located on the right side of the tilt console. If the supply and equipment requirements do not agree, contact your dealer or Southbend Steam Food Service Equipment Ltd.

Select a location with drainage directly below the tangent draw-off. Allow sufficient rear clearance from wall for kettle cover to lift upright freely and completely without obstructions

INSTALLATION CODES AND STANDARDS

Your electric tilting kettle must be installed in accordance with:

1. Provincial and local codes, or in the absence of local codes, with: C.S.A. C22.1 Canadian Electrical Code, Part 1, or in the U.S.A., the National Electrical Code ANSI/NFPA-70 (latest edition).
2. ANSI NFPA Standard #96, "Vapor Removal from Cooking Equipment," (latest edition), available from the National Fire Protection Association, Batterymarch Park, Quincy, MA, USA, 02269.

TO INSTALL

1. The kettle must be installed in accordance with:
 1. State and/or local codes.
 2. In the USA, the National Electrical code, ANSI/NFPA-70 (latest edition). In Canada, the Canadian Electrical Code, Part 1, CSA Standard C22.1 (latest edition).
2. Set the kettle in the installation location.
3. With the kettle in position, place a carpenter's level on top of the kettle and turn the adjustable feet to level kettle side-to-side and front to back. On EP models use shims to level kettle.
4. Mark hole locations on floor through anchoring holes provided in flanged adjustable feet, or holes provided on pedestal base.
5. Remove kettle and drill holes in locations marked on the floor (see installation diagram). Insert proper anchoring devices to accommodate 5/16" size lag bolts (not supplied).
6. Reposition kettle. Re-level kettle by making necessary adjustments on flanged feet or shims.
7. Bolt down kettle and seal with Silastic or other equivalent sealing compound. Sealant must be applied not only to bolt heads but also around flanges or pedestal base making contact with floor surface to fulfill NSF requirements. Wipe off excess sealant immediately.

ELECTRICAL CONNECTION

 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).

 WARNING

Disconnect the electrical power supply and place a tag at the disconnect switch to indicate that you are working on the circuit.

A Control Box with power supply equivalent to electrical rating of the kettle should be located conveniently nearby.

Remove the wiring compartment cover and make electrical connections per wiring diagram located inside the control housing cover panel. A waterproof electrical connection from power supply to rear of control housing must be provided.

Kettle must be grounded in accordance with requirements of the National Electrical Code or applicable local codes.

Ground kettle to terminal provided in control housing.

Once proper connections are made, replace wiring compartment cover, turn power ON and check for proper operation.

SERVICE CONNECTIONS

All internal wiring for the kettle is complete.

If faucet is provided connect water supply and check for proper operation.

OPERATION

NOTICE

Contact the factory, the factory representative or a local service company to perform maintenance and repairs should the appliance malfunction.

WARNING

The kettle and its parts are hot. Use care when operating, cleaning and servicing the kettle.

INSTRUCTIONS

Ensure that the external electrical service to kettle is on.

Check pressure gauge for correct cold kettle reading. Reading should be in the green area of the gauge indicating 25 - 30 In. Hg (630 - 730 mm Hg) of vacuum. If reading is not low enough, follow VENTING procedure in Troubleshooting section prior to using kettle.

Place power switch to ON position.

Preheat kettle by placing thermostat knob at '10' and wait until TEMPERATURE light goes off.

NOTICE

Preheating should not be used when cooking milk and egg food products which adhere to hot cooking surfaces. These foods should be placed into kettle before heating has begun.

Add food to be cooked into kettle.

Place thermostat knob at required temperature setting from 1 to 10 coinciding with the following table: THERMOSTAT

THERMOSTAT SETTING	APPROXIMATE (JACKET) TEMPERATURE		THERMOSTAT SETTING	APPROXIMATE (JACKET) TEMPERATURE	
1	140° Fahrenheit	60° Celsius	6	223° Fahrenheit	106° Celsius
2	155° Fahrenheit	68° Celsius	7	240° Fahrenheit	116° Celsius
3	172° Fahrenheit	78° Celsius	8	255° Fahrenheit	124° Celsius
4	187° Fahrenheit	86° Celsius	9	271° Fahrenheit	133° Celsius
5	205° Fahrenheit	96° Celsius	10	285° Fahrenheit	140° Celsius

When cooking is finished set thermostat knob and power switch to OFF position.

Pour finished product from kettle using tilt handle. Be careful to avoid splashing.

Add water to kettle for cleaning purposes.

Wash kettle thoroughly. See CLEANING procedure, next section.

CLEANING

 WARNING

Disconnect the power supply to the appliance before cleaning or servicing.

 WARNING

Never spray water into electric controls or components!

 WARNING

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 and 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 or using the optional tangent draw-off valve to allow the detergent and water solution to drain.
4. Wipe the exterior of the kettle with a clean, damp cloth.

 WARNING

If you are cleaning a valve that is assembled to a kettle, be sure the kettle is **completely empty of any product**.

NOTICE

Draw-off valve has a vulcanized rubber coated stem for better sealing. Do not over tighten. This may cause the rubber to pull away from stem and permanently damage it. This is not covered under warranty.

DRAW-OFF VALVE CLEANING

1. If equipped with a tangent draw-off valve, turn the large hex nut on the draw-off valve counterclockwise until it is completely disengaged from the threads. Grasp the valve knob and slowly pull out the valve stem. Wash the valve stem, disk and handle. Insert a nylon brush, wet with detergent and water, into the valve body and tangent draw-off tube. Brush vigorously.
2. Replace the valve stem assembly and turn the hex nut until snug. Rinse the kettle with clean warm water.
3. Leave the draw-off valve open when the kettle is not in use.

DAIRY DRAW-OFF VALVE CLEANING

1. Remove the plug by first removing the handle, then turn the plug to line up with the pin and pull with both hands. It is important to use both hands because the plug is heavy.
2. Put the plug in a plastic pail that contains a mild soap solution. A plastic pail works best, as it reduces the possibility of nicking or scratching the plug. If the plug gets scratched it may not seal correctly and could leak.
3. Use a soft cloth or soft brush and clean all surfaces.
4. Using both hands remove the valve from the soap and rinse well in another plastic pail that contains fresh water.
5. Wash out the kettle as normal.
6. Return the plug into the body. Be sure the plug is inserted into the notch and turned. Ensure the plug is tight and secure before letting go of it.

If you are cleaning a body and plug assembly, remove the plug and follow the above procedures. When finished with the plug, follow the same instructions for washing the body. Always use both hands when handling the plugs. Reassemble the plug into the body and use as normal.

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 for 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 vapors 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 CIRCULAR 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.

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.

MAINTENANCE

GENERAL MAINTENANCE

No general maintenance is required other than adhering to the Cleaning Procedure instructions.

NOTICE

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

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 allow 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.

TROUBLESHOOTING

LOW WATER LEVEL

Proper water level must be maintained within the jacket for the kettle to operate. Depletion of water may occur from excessive opening of or leakage through the safety relief valve.

If water is below required operating level, either initially at start-up or during use, the kettle will automatically shut off and the LOW WATER signal light will come on.

In order for the kettle to operate, the following procedure must be followed:

The kettle must be cool before proceeding with the following steps.

1. Trip the safety relief valve lever to relieve all pressure from the kettle jacket.
2. At exterior rear of kettle jacket remove nut from Air Vent.
3. Insert funnel into Air Vent opening and slowly add the indicated amount of clean water for:

MODEL	ADD		IF COMPLETELY EMPTY, ADD	
KELS/KEPS-20F	220 ounces	6.5 litres	548 ounces	16.20 litres
KELS/KEPS-30F	250 ounces	7.39 litres	586 ounces	17.33 litres
KELS/KEPS-40F	340 ounces	10.05 litres	850 ounces	25.12 litres
KELS/KEPS-60F	420 ounces	12.42 litres	1088 ounces	32.17 litres

4. Replace air vent nut.
5. Follow Air Venting Instructions.
6. Continue normal Operating Procedure of kettle.

EXTREMELY SLOW COOKING TIME

1. If the cooking time is abnormally slow, then the difficulty may be due to air being present in the kettle jacket. To remove air, follow AIR VENTING INSTRUCTIONS.
2. If the kettle will not reach and maintain Pressure Gauge zone in the green area on the gauge when cold, a slow leak may have developed in the jacket. Check all fitting connections to jacket including the heating element gasket. Tighten or replace if necessary.
3. Slow cooking time may also be due to a burnt out heating element. Test elements and if defective, replace complete element assembly.

KETTLE WILL NOT OPERATE WHEN TURNED ON

1. Check that power supply is available to kettle.
2. Kettle will not operate if water level is inadequate in jacket. Follow LOW WATER LEVEL instructions.
3. If water level is sufficient and kettle refuses to operate, then check that Tilt Interlock Switch in Console is fully engaged when kettle is in its normally upright position. Adjust Retaining Tilt Collar if necessary to assure complete contact with switch and if kettle still does not operate, then check for defective switch and/or loose wiring connections.
4. When Thermostat Knob is dialed and TEMPERATURE indicator light does not come on, then it may be due to either a defective Thermostat or loose wiring connection(s).
5. Check that the Contactor(s) are being energized and power is being made available to the heating elements when thermostat is dialed. Replace defective Contactor(s).

DRAW-OFF VALVE LEAKS

If leak occurs through the valve stem, replace the "O" ring. If the leak is caused by faulty sealing between the stem disc and valve seat, this can be corrected by cleaning off dried on food residue with an extremely fine emery cloth. If the vulcanized rubber stem piece has been damaged, it must be replaced.

NOTICE

Draw-Off Valve has a vulcanized rubber coated stem for better sealing. Do not over-tighten. This may cause the rubber to pull away from stem and permanently damage it. This is not covered under warranty.

AIR VENTING INSTRUCTIONS

Check vacuum/pressure gauge when the kettle is cold. Gauge should be in the green vacuum zone, indicating a vacuum between 25-30 In. Hg (630 - 730 mm Hg). If not, air must be vented (removed) for proper heating. Use the following procedures to vent air.

1. Place power switch ON with kettle empty.
2. Set temperature control thermostat to '10'. Heat kettle until indicator light goes off.
3. Using a 7/16" wrench, open bleed vent one full turn for 10 seconds and then close. (Located on back of kettle, before pressure relief valve.)



WARNING

SCALD HAZARD

Live steam will escape the bleed nut when opened. Stay clear of live steam when performing this operation.

4. Cool kettle. Check for proper vacuum in green area of gauge. If vacuum was not established, repeat steps 1 - 4.

APPENDIX 'A'

**SAFETY DATA SHEET**
DOW CHEMICAL CANADA ULC**Product name:** DOWFROST™ HD Heat Transfer Fluid, Dyed**Issue Date:** 01/19/2017**Print Date:** 01/23/2017

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.

1. IDENTIFICATION

Product name: DOWFROST™ HD Heat Transfer Fluid, Dyed**Recommended use of the chemical and restrictions on use**

Identified uses: Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the 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:** 1-888-226-8832**Local Emergency Contact:** 613-996-6666

2. HAZARDS IDENTIFICATION

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component**CASRN****Concentration**

Propylene glycol	57-55-6	> 93.0 %
Water	7732-18-5	< 5.0 %
Dipotassium hydrogen phosphate	7758-11-4	< 5.0 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

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

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

Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for firefighters

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

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Keep unnecessary and unprotected personnel from entering the area. 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. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Conditions for safe storage: Do not store in: Galvanized steel. Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
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
	CA ON OEL	TWA	155 mg/m3 50 ppm
	CA ON OEL	TWA	10 mg/m3
	CA ON OEL	TWA Vapour and aerosols	155 mg/m3 50 ppm
	CA ON OEL	TWA aerosol	10 mg/m3

Consult local authorities for recommended exposure limits.

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 alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow to green
Odor	Characteristic
Odor Threshold	No test data available
pH	9.5 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	closed cup 104 °C <i>Pensky-Martens Closed Cup ASTM D 93</i> Propylene glycol., (based on major component)
Evaporation Rate (Butyl Acetate = 1)	< 0.5 <i>Estimated.</i>
Flammability (solid, gas)	Not applicable to liquids
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)	1.06 at 20 °C / 20 °C <i>Literature</i>
Water solubility	100 % <i>Literature</i>
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	No data available

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

10. STABILITY AND REACTIVITY

Reactivity: 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.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

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

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

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.

Skin corrosion/irritation

Prolonged contact is essentially nonirritating to skin.
Repeated contact may cause flaking and softening of skin.

Serious eye damage/eye irritation

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

Sensitization

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

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

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

Carcinogenicity

Similar formulations did not cause cancer in laboratory animals.

Teratogenicity

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

Reproductive toxicity

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

Mutagenicity

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

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Dipotassium hydrogen phosphate

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.**Dipotassium hydrogen phosphate****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.**Dipotassium hydrogen phosphate****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.**Dipotassium hydrogen phosphate**

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

14. TRANSPORT INFORMATION

TDG

Not regulated for transport

Classification for SEA transport (IMO-IMDG):**Transport in bulk
according to Annex I or II
of MARPOL 73/78 and the
IBC or IGC Code**

Not regulated for transport

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Canadian Domestic Substances List (DSL)

This product contains at least one substance which is not listed on the Canadian Domestic Substances List (DSL).

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
0	1	0

Revision

Identification Number: 101199333 / A208 / Issue Date: 01/19/2017 / Version: 7.0

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
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TWA	8-hr Time Weighted Average
TWAEV	time-weighted average exposure value
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

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.

NOTES

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KELS-20F, KELS-30F, KELS-40F, KELS-60F KEPS-20F, KEPS-30F, KEPS-40F, KEPS-60F Self-Generating Steam Full Jacketed Kettles



A product with the Southbend Steam name incorporates the best in durability and low maintenance. We all recognize, however, that replacement parts and occasional professional service may be necessary to extend the useful life of this appliance. When service is needed, contact a Southbend Steam Authorized Service Agency, or your dealer. To avoid confusion, always refer to the model number, serial number, and type of your appliance.



SOUTHBEND STEAM
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