Heat Tracing for Grease Waste

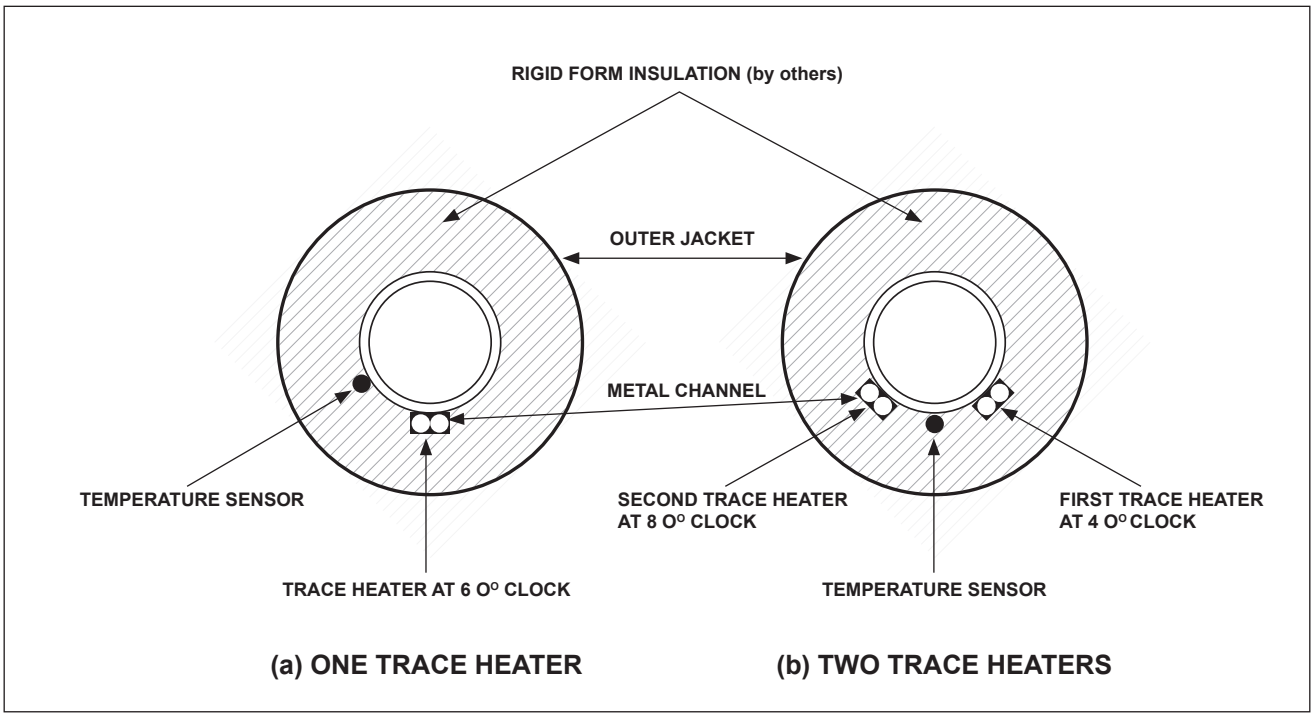
Grease interceptors are increasingly installed further away from the kitchen – often outside of the building. This makes it important to heat the FOG (Fat, Oil and Grease) and reduce its viscosity from the initial flow point to the grease interceptor to prevent blockage and maintain flow within the pipe. FOG separates best when the waste water is hot – typically between 109.4° F – 120.2° F. Pipe insulation alone is not enough to keep grease waste flowing. MIFAB® has a product solution to heat trace the piping from the source of the grease waste to the grease interceptor to prevent clogging of the pipes.

Pipe clogged with grease

Standards and Codes

The Standard for commercial heat tracing is — IEEE515.1. This references grease waste flow maintenance. Items of note for grease waste flow maintenance from IEEE515.1:

1. Maintain Temperature: 43-49C = 109.4° F — 120.2°F
2. Temperature difference for buried piping = Temperature Maintain — Soil Temperature
3. Heater Location: Gravity pipe so heater location should be as indicated below:



4. This is a line sensing control application which means a temperature sensor needs to be placed on the grease waste pipe. The location of the sensor should be 50mm or 2" from the heater. On plastic pipe, two heaters are recommended versus a single heater for cast iron pipe with placement @ 4 & 8 o'clock. The temperature sensor shall be placed between the two heaters.
5. The cable outer jacket is required to be a fluoropolymer to protect the heater core from FOG (Fats, Oil and Greases) which is unable to permeate the fluoropolymer jacket.

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Canadian & USA National Electric Codes impact the design in two ways:

1. Ground Fault circuit protection is required for all heat tracing circuits. For this application, it would be equipment protection level = 30mA. This is a safety measure for ensuring that the circuit is de-energized if the currents leakage is 30mA or greater.

2. Electrical connections are not permitted below grade. That means no power connections, splices, tees or end sealing of the heat trace cable.

General System Operation

Heat is added to the grease waste piping from the kitchen to the exterior grease interceptor. The amount of heat needed is the temperature difference between the ambient temperature of the pipe and the desired constant temperature.

Parts of a Grease Heat Tracing System:

1. Heating Cable

a. Watts Density: For grease waste pipe heat tracing, we recommend SRF-##-#-CT. The first two numbers represent the watts density of the cable: 3, 5, 8 or 10 per foot. The second number represents the voltage of the cable either 1= 120V or 2 = 208-277V.

b. Cable Outer Jacket: CT — fluoropolymer jacket. CR — polyolefin jacket. The IEEE 515.1 Standard requires CT jacket for grease waste pipe heat tracing. We recommended cable model no. SRF8-2CT (8 watts/ft. @ 208-277V).

2. Controller

a. We recommend the ICT1/2 controller.

b. The biggest issue is ground fault circuit protection. It can be done in one of two ways: At the circuit breaker panel or at the heat trace controller. It is often overlooked at the panel because the plumbing engineer and the electrical engineer have not co-ordinated it. If forgotten by either side, it can be an issue for the installer because 30 mA EPD breakers can get expensive in the higher voltages. Therefore, we strongly recommend the controller have that capability integral to the unit.

c. The second issue is communications. The trend is to tie the heat trace controller to the BMS. The ITC1/2 is the starting point for this capability.

d. The ITC1/2 is available in two versions — ITC1 = single circuit or ITC2 = two circuit.

3. Sensors

a. We recommend 100 Ohm, three wire RTD sensors for temperature input. We recommend model # RBF-HT-##-FA-CF which is an RTD with an armored cable over the wires.

b. The ## represents the length of the pigtail which will be either 10' or 50'.

c. One sensor per circuit is required.

4. Components

a. Components are the transition from line voltage to heating cable, heating cable splices or tees and end seals. We need two different versions for this application depending on the location of the grease waste pipe. For buried pipe, we recommend our EL Series of crimp & heat shrink components and for all other pipes — indoor or exterior will use our SnapFit — Quick connect components.

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5. Accessories

a. Typically, the heating cable is secured to the grease waste pipe with fiberglass tape every 18"-24".

Alternatively, plastic wire ties can be used instead of fiberglass tape. Our tape requirements for different pipe diameters are listed below:

TAPE TYPE	ROLLS NEEDED PER 100' OF PIPE								
	PIPE DIA. (IN.)								
	1/2"	1	2	3	4	6	8	10	12
FT-3	1	2	4	4	6	8	10	12	15

b. **Labels:** Identification labels are required on the exterior of the pipe at an interval of every 10 feet on opposite sides of the pipe.

c. **Aluminum Tape:** PVC waste pipe will require aluminum tape over top of the heating cable.

d. **INSULATION:** Is required for any pipe heat trace application. Grease waste pipe which is buried must be recommended by the insulation manufacturer to withstand the loading of the soil and still provide insulation to the pipe. Exposed piping is much easier to insulate and conventional fiberglass and foam style insulations can be used on this piping. Insulation is to be purchased from others.

Grease Waste Pipe Heat Tracing Maintenance Design Challenges

The biggest challenge is determining the ambient temperature zone of the grease waste piping on the project. There are three ambient temperature zones: buried, outdoor and temperature controlled environment. Each ambient temperature zone affects the temperature difference of the pipe. A project can have one ambient temperature zone, two or all three. For example: on a recent 20 story building, a law firm was located on the 20th floor with a kitchen adjacent to the offices. The grease waste stack obviously needed to travel 20 floors before exiting the building into a parking garage. The pipe then traveled horizontally for 50' before going underground to the exterior grease interceptor. This resulted in three ambient temperature zones for the same grease waste. Each ambient temperature zone required a different circuit and a different cable.

The most common application is for a direct buried grease waste pipe from the exterior of the building to the grease interceptor. The challenge with this application is getting the heating cable & sensor on and off the pipe. The heating cable must be protected if it is direct buried. The design engineer should show a conduit as a raceway for the cable on and off of the pipe. The vent on the interceptor might be used as the exit point for the heating cable. Alternatively, the heating cable can be brought above grade at the building foundation, and power connected and terminated inside of a project approved junction box.

Because it is line sensing application, we recommend a temperature sensor be installed onto the grease waste pipe with the same approach as above in a conduit from a j-box to the pipe. This can be an expensive fix for the installer if forgotten.

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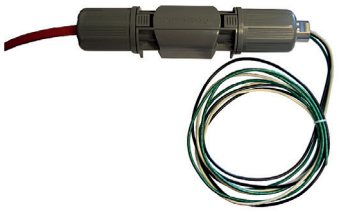
SYSTEM COMPONENTS

SRF-CT HEATING CABLE

MIFAB® SRF Heating Cable is designed to add in the additional heat required to keep the FOG flowing until it reaches the interceptor where it can separate. Our SRF cable with self-regulating technology is ideally suited for this application because it adjusts its heat out in response to sensed temperature of the pipe - adding the correct amount of heat efficiently along the entire length of greasy waste piping. Our SRF heating cable attaches quickly to either plastic or cast iron sanitary pipe lines and doesnt require spiral wrapping of the cable around the pipe.

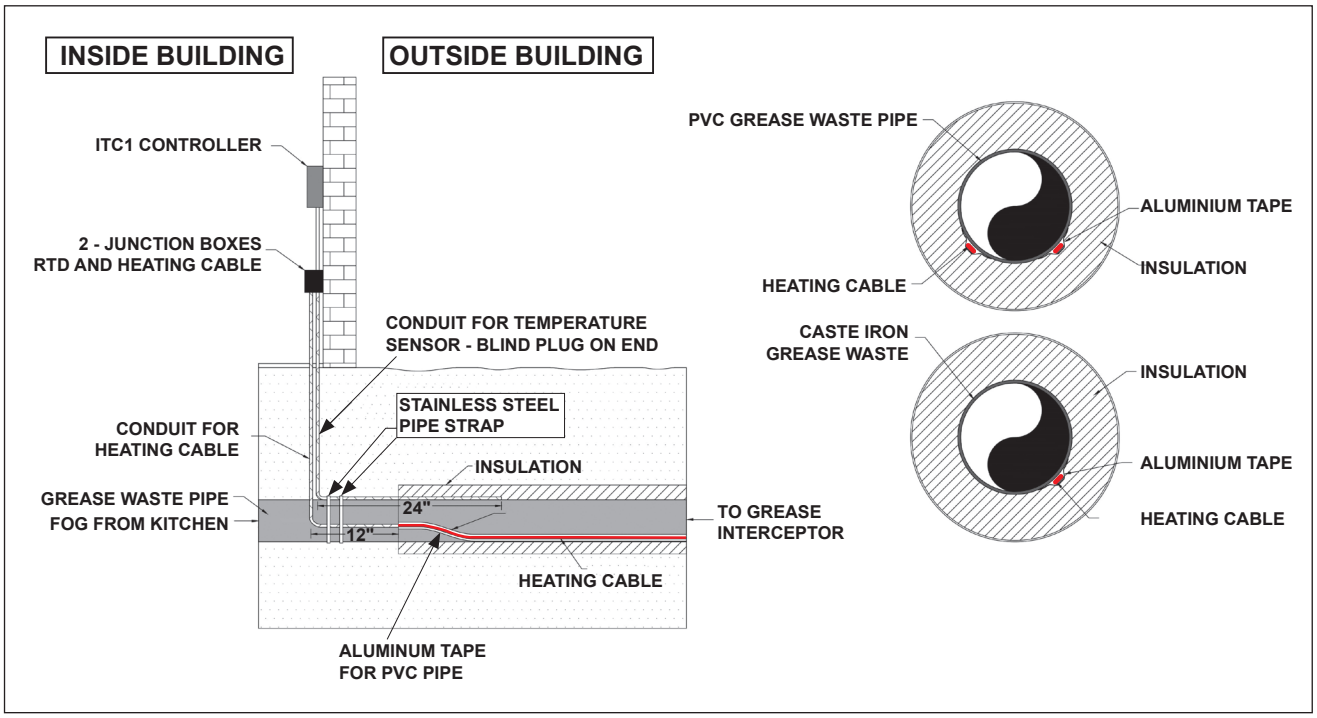
SNAPFIT CONNECTION KITS

MIFAB®'s Grease Waste Flow Maintenance System is compatible on either above ground or below grade piping. The cable is attached to the bottom the piping, adding heat to the keep the grease liquid and flow to the interceptor. Our SnapFit Connection System makes it easy for any trade to connect the heating cable to the piping. Simply tighten the cap to make a waterproof, connection of the heating cable. SnapFit Connections are available for Power, Tees, Splices & End Seals.



ITC HEAT TRACE CONTROLLERS

Our state of the art, digital ITC1/2 Controller provides a full color display of set & actual pipe temperatures, alarms & system status. Our ITC1/2 Controller can communicate system information with your building management system. This offers a complete solution to prevent clogs and blockage in your greasy waste piping. Contact your local MIFAB® Sales Representative for more information or design assistance.



Design and dimensions are subject to modification. Prices do not include applicable taxes. Visit www.mifab.com for the most recent product information.

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