



Cold Weather Technologies (a Division of Grit Industries Inc.)

Dry Line Heater

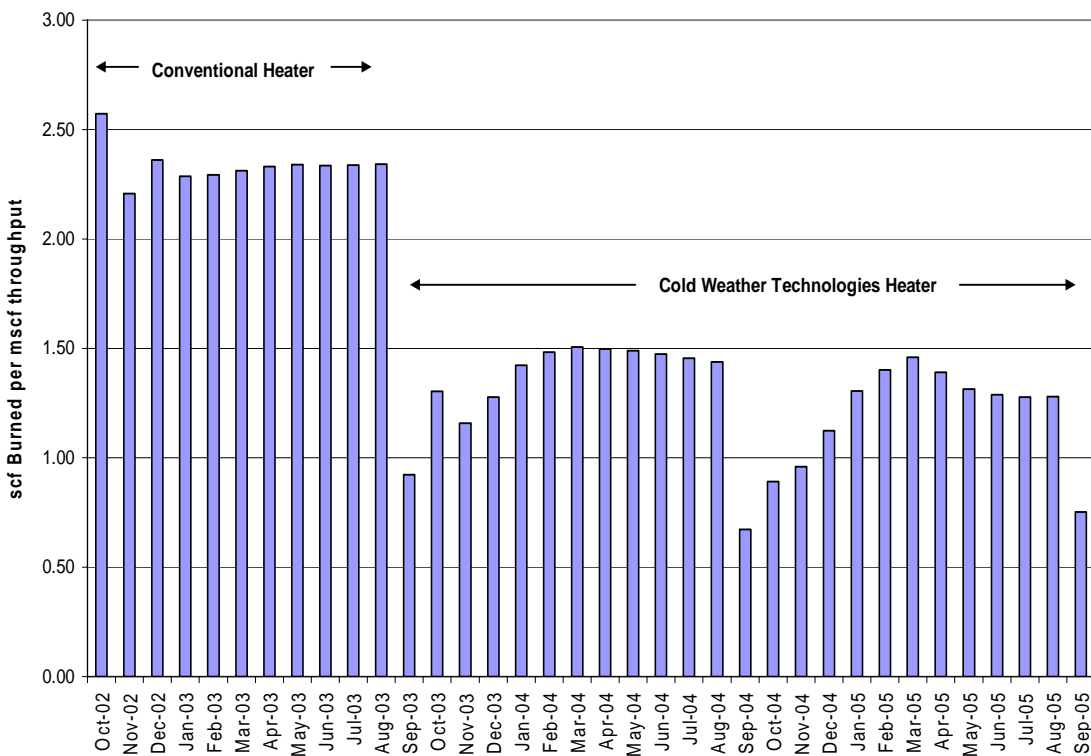
Frequently Asked Questions

1. How does the CWT compare with conventional technology in terms of efficiency?

The CWT line heater has a thermal efficiency of between 75 and 80%. A conventional line heater typically has a thermal efficiency of 35 to 50%. This means that in most applications the CWT will use less than half the fuel for the same load as a conventional heater.

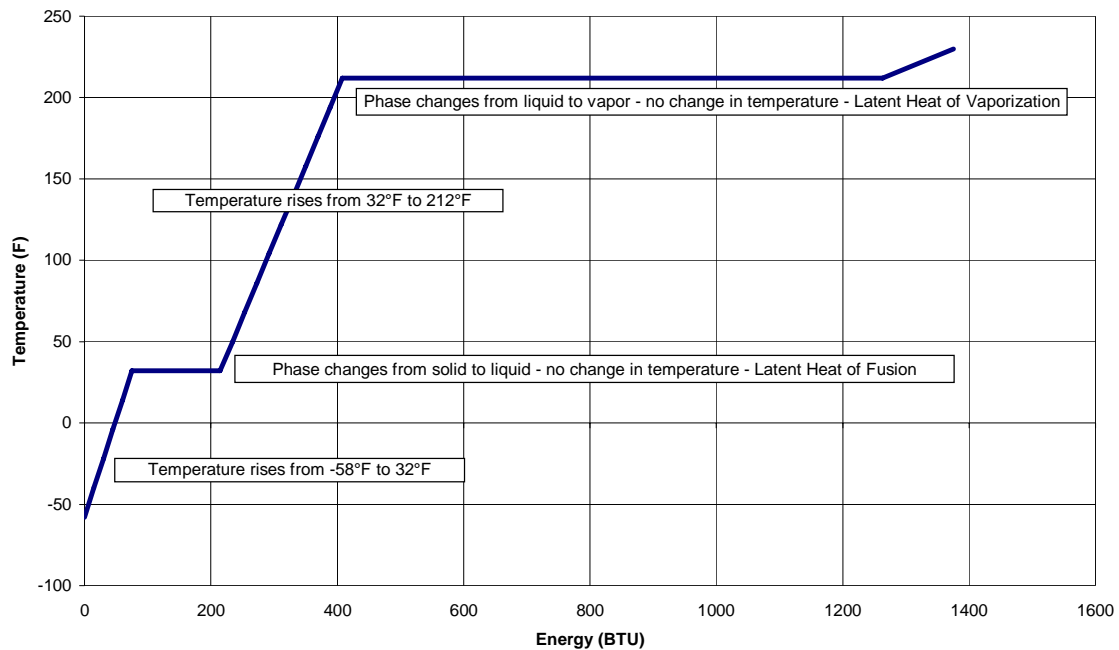
For example, if we have a 500,000 btu/hr CWT heater it will do the work of 1.0 mmbtu/hr conventional heater. If we assume that both are running 75% of the time, the conventional heater would consume 3,285 mmbtu/year more than the CWT. Using a gas price of \$7.00 per mmbtu, the extra fuel cost is in the order of \$23,000 annually. In most cases the CWT will pay out in 1 to 2 years

Melville Station Usage Ratio
Line Heater Consumption (scf) per Station Throughput (mcf)





Heat Required to Change 1 lb of Ice at -58 °F to 1 lb of Steam at 220 °F
(at atmospheric conditions)



The system uses the latent heat of vaporization for the heat transfer. Note in the chart above the large amount of energy required to turn water into steam. When you condense that water, that energy is released to heat the gas.

Using steam for the heat transfer results in very high efficiency. As the system operates at less than 14.7 psi and 250°F, it is not a pressure boiler and does not need ticketed operators nor does it have to be registered.

2. The CWT operates on a vacuum. Why?

The CWT boils water in a vacuum to make steam for the heat exchange process. There are a number of reasons. First and foremost, the boiling point of the water is reduced significantly under a vacuum. Water at atmospheric pressure boils at 212°F. In the CWT the water boils at about 110°F. Using the latent heat of the steam to heat the process fluid makes us very efficient.

The vacuum also reduces corrosion as there is no air in the system and allows the CWT to operate at less than 14.7 psig and 250°F so it is not considered a pressure boiler.



3. Does the CWT require utility power?

No utility power is required for the CWT. The unit operates with internally generated power. A high quality furnace power-pile system creates a 700 mV current from the standing pilot. This is sufficient to provide the power required to operate and control the system.

As a result the unit is impervious to power failure; the only utility required is natural gas.

If external power is available, and if the client wishes, the device can be installed with an optional burner management system which would allow automatic relights and alarm through SCADA.

There is no need to provide expensive utility power nor is an electrician required for installation or maintenance.

4. What kind of fuel does the CWT use and at what pressure.

The CWT can operate on natural gas or propane and can be modified to operate on liquid fuels as well. Gas or propane need to be delivered to the heater at between 0.5 and 1.0 psig.

5. How much fluid is required and do I need secondary containment?

The CWT uses a 50/50 water glycol mixture for the heat exchange. The standard glycol is propylene based and is none toxic. The volume is significantly less than a conventional indirect heater and is generally less than 15 gallons. Secondary containment is not required in most jurisdictions.

The device is a sealed unit and all required fluids are supplied with the purchase. In larger units this is a significant advantage in both capital and operating cost impacts. A large conventional line heater will often hold barrels of glycol while the CWT requires gallons.

On an ongoing basis, fluid is added to a conventional glycol bath type heater as it is evaporated away – the CWT has a sealed system and does not require additional glycol over time.

There is no need to monitor the mixture of to add fluid to the CWT

6. What do I need to do to install the CWT?

The CWT needs to be set on a solid foundation. The system operates better outside so no building is required. Installation consists of 1)



hooking up the fuel supply, 2) connecting the process lines in and out, and 3) installing the operating temperature control in the process stream.

7. What sizes are available?

The CWT comes in a number of standard sizes and can be scaled to as large an application as is required. The system can be turned –down and tuned to best match the application and further increase efficiency.

8. How noisy is the heater?

The CWT is completely silent while operating and is suitable for urban and semi-urban areas.

9. What about emissions?

The CWT burns significantly less fuel than conventional systems and burns it more efficiently. Emission reductions in the order of 50% from conventional technology can be expected.

10. Is the system approved and compliant?

The heater complies with the Canadian Gas code and the pressure components are constructed and registered as per ASME.

The system has an electric burner control system complete with a flame failure shutdown and is appropriate for Class 1, Zone 2 hazardous locations. The heaters are CSA approved as gas appliances in Canada and the USA. As a result there should be little, if any, additional approval and inspection by local authorities after installation.



The system is compliant with the Canadian Gas Code, and follows the fuel train requirements specified in the code. Some of the specific safety controls include:

- Flame Failure Shutdown
- High Temperature Shut Down
- High Temperature ESD
- High Pressure Shut Down
- Push Button Ignition



11. How long have the CWT's been in service and how many are in the field?

The first CWT heaters were in the field in 2001 in heavy oil heating applications. The first natural gas heaters were installed in 2003. There are over 200 natural gas line heaters in service across North America.

12. What maintenance is required on a CWT?

On an annual basis the flame arrestor should be blown out with compressed air to insure enough air can pass to support combustion. The safeties and shut downs should be function tested and a glycol analysis done.

The pressure coil should be inspected every 10 years or so to monitor for corrosion.

13. I am a long way from Alberta Canada where the CWT is built. How can we insure I get adequate service and support.

CWT offers 24 hour telephone support and troubleshooting.

The CWT is very simple to service and the components are standard furnace parts. Our representatives in your area will be able to handle most service concerns and provide support.

In those cases where a CWT technician is required we can be there tomorrow.

14. What kind of warranty is provided?

The CWT has a 2 year warranty on all parts and labour.

15. I am reluctant to try something new. What assurances can I have that the heater will perform as promised?

CWT can provide you with a list of references from companies that have CWT units in service. We also provide a Performance Guarantee. If at the end of the first heating season you are unhappy with your CWT we will buy it back.