

TubeTrace® vs. Field Installation

The following is a comparison between the installations of TubeTrace preinsulated tubing and field routed, heat traced, and insulated tubing for a differential pressure transmitter application. There are other benefits besides the obvious up front cost savings. Other benefits include increased reliability, lower purchasing costs, and lower inventory costs. The reliability issue is easy to see once you understand how tubing is installed, insulated and heat traced in the field.

The field insulated and heat traced system consists of straight sticks of tubing joined with compression fittings. Typically, the tubing is routed from a primary element such as an orifice plate to a pressure transmitter along existing structure and secured in place with conduit or tubing clamps at 5' intervals. It is important that both tubes are routed parallel and together otherwise each tube would have to be heat traced and insulated separately causing the installation cost to increase significantly.



Typical Field Installations

Heater cable is applied to the tubing and secured in place with tape at 1' intervals. Special attention must be paid to clamping areas where the tubing is secured to existing structure. These metal-to-metal contact points are major heat sinks requiring extra heat or thermal insulation. Heater cable may need to be applied serpentine in these areas to provide extra heat. This is no easy task considering the relative size of the heater cable compared to the tubes.

Thermal insulation is applied by spiral wrapping the tubing and heater cable with 2" wide by 1/4" thick woven fiberglass insulation. The insulation is wrapped at a 50% overlap for a total thickness of 1/2". There may be great difficulty wrapping the tubing near clamps, especially if the clamps are not adequately spaced away from structure. Again, these are critical heat sink areas where the tubing is most likely to freeze.

Once insulated, mastic is painted over the entire installation. This mastic provides sealing from water. However, the mastic will crack and lose integrity after about 6 months. New sealing coats should be applied periodically.

Inventory and purchasing costs are also higher for the field insulated system. The field insulated system requires 7 components compared to 3 TubeTrace components. The TubeTrace

system only requires contact and coordination with one vendor. The field insulated system requires contacting at least 4 vendors.

It is easy to see why TubeTrace preinsulated tubing bundles are cost effective solutions to instrument heat tracing applications. Not only are up front costs lower, reliability is significantly increased for both the short and long term. Clamping areas have little effect on the thermal efficiency of TubeTrace. The thermal insulation is machine wrapped consistently to controlled thickness tolerances. You can expect even and consistent temperatures throughout the installation improving instrument accuracy. TubeTrace is manufactured from continuous coils of tubing reducing potential leaks by eliminating in-line fittings. And finally, the outer jacket of TubeTrace is continuous extruded plastic impervious to water and weather for the life of the installation.

Design Conditions

Instr. Tubing Req'd (2) 1/2" x .049" 316 SS Seamless Tubes
 Tube Length 30' from orifice tap to DP transmitter
 Maintenance Temperature 50°F
 Ambient Temperature -20°F, 25 mph wind
 Available Power 120 Vac

Case A: Field Traced and Insulated Instrument Tubing

		Material	Labor
1/2" 316 SS Seamless Tubing (20' sticks)	60' @ \$2.50/ft	\$ 150.00	7.20 hrs
BSX Self-Regulating Heater	35' @ \$4.85/ft	169.75	2.40 hr
Heater Cable End Terminations		93.25	1.25 hrs
Tape for Heater Cable and Insulation		9.25	--
1/2" 316 SS Unions	(2) @ \$10.50	21.00	.25 hrs
Thermal Insulation, woven 2" x .25" thick	94' @ .60/ft	56.40	7.50 hrs
Layers Waterproofing Mastic	(2) @ \$4.00	8.00	--
	Total Labor @ \$25.00/hr	--	18.60 hrs
	Sub-Totals	\$ 507.65	\$ 465.00
	Total Installed Cost	\$ 972.65	

Case B: TubeTrace® Pre-Insulated and Heat Traced Tubing

		Material	Labor
TubeTrace #ME-4F2-42-3-ATPVC-049	32' @ \$17.05/ft	\$ 545.60	3.90 hrs
Tubing Bundle End Seals FAK-7		12.25	.50 hrs
Heater Cable End Terminations		93.25	1.25 hrs
	Labor @ \$25.00/hr	--	5.65 hrs
	Sub-Totals	\$ 651.10	\$ 141.25
	Total Installed Cost	\$ 792.35	

Form TT117-0802



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