TECHNICAL UPDATE - TU-3001

SUBJECT: Cost Comparison – Dekoron-Unitherm Preinsulated Bundles and Field Fabrication

This update deals with the cost of purchasing and installing Unitherm 2200-40A35 Preinsulated tubing bundles in a typical operation in place of field fabricated stainless steel tubing.

Conditions of Installation and Costing:

This report is based on a total project requiring 1200 feet of insulated tubing in 60 foot runs from a manifold or process line to an instrument.

Operating conditions are:

Normal operating temperature	<400°F;
Normal operating pressure	500 PSIG or greater;
Minimum ambient temperature	-40°F;

Construction materials are as follows:

Field Fabricated Tubing:

Pipe:	½" OD x 0.035" wall welded Type 316 Stainless Steel Tubing
Insulation:	fibrous glass thermal insulating tape, 2 layers,
Jacket:	weatherproof mastic
Fittings:	Fabricated line requires two stainless steel compression fittings to join tubing to manifold and process.

Unitherm Preinsulated, Steam Traced Tubing:

Bundle:	Unitherm 2200-40A35
Composed of:	½" OD x .035" wall welded ASTM Type 316 stainless steel tubing; Moisture resistant, non-wicking, fibrous glass thermal insulation; Continuous, extruded black FRPVC outer jacket;
Fittings:	Bundle requires two stainless steel compression fittings to join preinsulated tubing to manifold and process.

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Construction Methods:

1. Hard piping per standard methods.
    a. Pipe laid out and installed by plumber or pipefitter, standard piping hangars on 10 foot centers.
    b. Insulation contractor applies insulation and weatherproofing. Special attention must be placed on insulating and applying mastic around pipe hangers to insure that moisture does not enter and ruin insulation, causing heat loss and possible premature failure of tubing.

2. Preinsulated Bundles:
    a. Bundle pulled in and installed by installer (generally a pipefitter), supported with standard conduit clamps on 6 foot centers horizontally 15 foot centers vertically. Smooth bends are used to route the bundle along existing supports. Clamps are applied over the insulation so no excessive heat loss is seen. Process tube is installed in compression fittings at process and manifold ends of the bundle.
    b. Installer attaches tracer to steam trap at process end of bundle and to steam supply at manifold end of bundle, and seal bundle ends.

Cost Analysis:

1. Field Fabricated Tubing (cost shown for 20 runs at 60 feet each)

Component Description	**Total Cost**
1200 ft ½" OD x 0.035" wall welded type 316 stainless steel tubing	$ 787.50
120 ½" pipe hangers (iron split ring)	$ 195.36
120 rolls 1/2" thk x 3" wide fiberglass insulating tape	$ 594.00
25 gal mastic weatherproofing	$ 679.00
Installation labor (total)	$ 6894.31
Total Installed Cost	**$ 9150.17**
Cost/foot	**$ 7.62**

2. Preinsulated, Steam Traced Bundles (cost shown for 20 runs at 60 feet each)

Component Description	**Total Cost**
1200 feet Dekoron Unitherm 2200-40A35	$3468.00
110 strut clamps	$ 275.00
120 feet strut channel	$ 345.00
2 tubes Unitherm 1535-02120 end sealant	$ 15.00
Installation Labor (total)	$2408.00
Total Installed Cost	**$6511.00**
Cost/foot	**$ 5.42**
Savings over field fabrication	**29%**

Labor cost based on Means Mechanical Cost Data, 1994 Edition #17, by Robert S. Means.
It should be noted that the savings increases with longer runs, based upon quantity purchases of Unitherm bundles.

Further Savings:

There are further savings in the application and use of Dekoron-Unitherm Preinsulated bundles.

First, field fabricated supply lines must be inspected yearly to insure that insulation is not cracked or missing, that jackets are tightly in place, that seams between insulation sections are still sealed.

The cost of this inspection varies from site to site. Over a five year period, the cost of inspections alone could total almost $10,000. Repairs to existing field fabricated systems would be an additional cost.

This cost is avoided by using Dekoron-Unitherm Preinsulated Bundles. The jacket is continuous and rugged, and is not affected by normal wear and usage. Being continuous, moisture cannot enter the insulation. Being rugged, dropped tools and an occasional workman using the bundle for a stepping stool causes no damage and loss of efficiency in the bundle. Most plants find it unnecessary to inspect preinsulated bundles, and repairs are unheard of.

A field fabricated system can lose 10% or more of it's insulation capabilities due to leaking seams, moisture in the insulation, missing or cracked insulation and damaged or compressed insulation.

A 10% increase in heat loss could cost over $35,000 for a 20,000 foot installation over a 5 year period.

Since the bundle is completely sealed throughout, the insulation stays at peak performance throughout the life of the system.