HEATED TUBING BUNDLE SOLUTIONS

WINTERIZATION • CONDENSATION PREVENTION • VISCOSITY REDUCTION • PERSONNEL PROTECTION

THERMON **The Heat Tracing Specialists®**

THERMON TUBING BUNDLES PROVIDE SOLUTIONS FOR:

• WINTERIZATION • CONDENSATION PREVENTION
• VISCOSITY REDUCTION • PERSONNEL PROTECTION

INTRODUCTION

Compared to bare tubing that is field traced and insulated, prefabricated tube bundles:

- Expedite installation
- Reduce installed cost
- Ensure long term reliability and safety of the entire system

Consistency and quality are a prerequisite in all Thermon manufacturing processes. Thermon organizations throughout the world operate to the ISO9001 standards.

With global design, manufacturing, and warehouse facilities, Thermon is capable of supplying heated instrument tubing products to meet the needs of customers around the world. Thermon manufactures every type of resistance heat tracing available today.

EXPERIENCE

Complete heat tracing systems must include instrument line heating. Thermon tube bundles are reliable, cost-effective products for heated and/or insulated tubing.

Thermon has earned the reputation as . . .
The Heat Tracing Specialists®, supplying both electric and steam heat tracing solutions since 1954.

BETTER SOLUTIONS

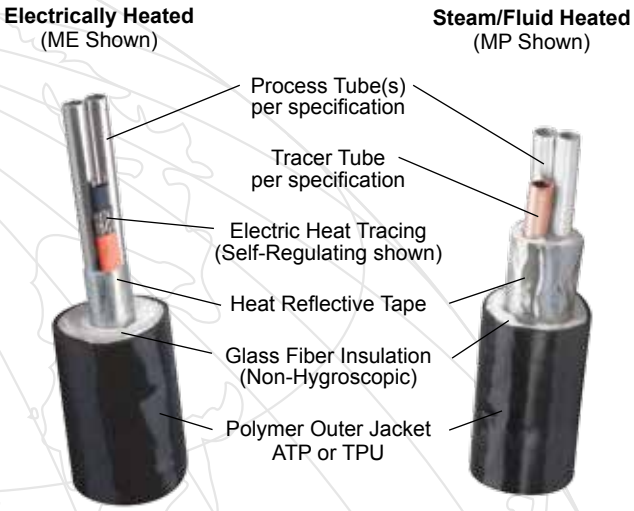
The heart of any electrically heated tubing bundle is the heat trace. **Thermon manufactures every type of resistance heat tracing available today.** Our sole-source responsibility for overall performance, especially in electrically classified hazardous areas, cannot be matched. Whatever the application — freeze protection, high temperature maintenance or sensitive analyser lines — Thermon's complete line of products provides superior heat tracing solutions.

INDUSTRIES

Many times tubing requires heat trace and insulation. Preinsulated tubing is the most reliable, consistent, and cost-effective way to accomplish this. Industries relying on instrument tubing bundles include:

- Oil and Gas Production
- Refineries
- Chemical plants
- Pharmaceutical
- Power Generation
- Pulp and paper
- Food Processing
- Other Process Industries

TYPICAL TUBETRACE® HEATED INSTRUMENT TUBING BUNDLES



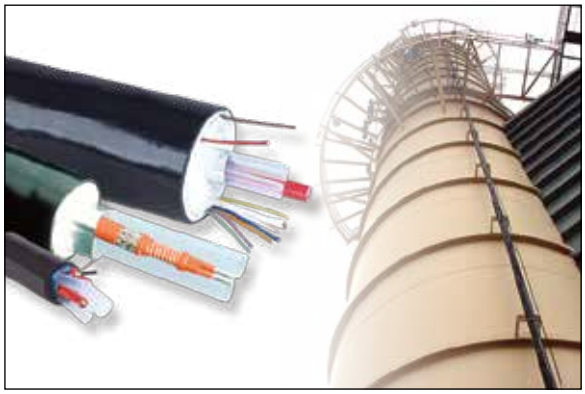
APPLICATIONS

Instrumentation must operate reliably to monitor critical processes and reactions, monitor emissions, and maintain control of the plant. This can require:

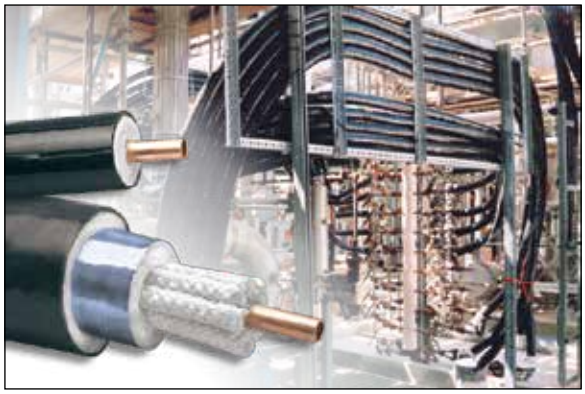
- Winterization / Freeze Protection
- Process Temperature Maintenance
- Personnel Protection from Burn Risk
- Keep Gas Streams Above Their Dew Point
- Prevent Condensation and Crystallization

THERMON HAS A **SOLUTION** FOR YOUR SPECIFIC APPLICATION

Process Instrumentation
Pressure, Flow and Level



Analytical / CEMS
Process Analysers,
Continuous Emissions Monitoring



Mechanical and Steam Tracing
Steam Supply / Condensate Return

TUBING OPTIONS

Thermon's flexible manufacturing process can include any tubing material:

- Stainless Steel 304 and 316, welded or seamless
- EP (Electropolished)
- CP (Chemical passivation)
- SilcoSteel *, SilcoNert * & Sulfinert * finishes
- Monel
- Titanium
- Inconel 825, and Alloy 20 are readily available
- Fluoropolymer tubing, PFA, TFE and FEP.
- Double containment tubing or multiple tube materials
  can be provided in a common bundle.
- Nylon, polyethylene, and most any other tubing material available.

* SilcoSteel and Sulfinert are trade names of Restek Corp.
SilcoNert is a trade name of SilcoTek.

POLYMER JACKETS

The need for protecting the thermal insulation and other components is accomplished with a continuous extruded polymer outer jacket.

Standard jacket material is ATP- (Arctic Thermoplastic), with optional TPU (polyurethane) and HTJ (high temperature jacket) materials available.

DESIGN TOOLS

CompuTrace-IT is an invaluable tool for projects that require steam and/or electrical heating for instrument tubing. Thermon's TubeTrace pre-insulated and heat traced tubing can easily be designed to include terminations and accessories for most applications. The user can create systems with hazardous area approvals with any one of five globally recognized standards. For steam heating applications CompuTrace-IT can design systems for "light" or "heavy" steam tracing.

CompuTrace®-IT computer design software can be downloaded from . . . **www.thermon.com**

ELECTRICALLY HEATED TUBING BUNDLES
TubeTrace® Type SE/ME

Small diameter lines are heated for many reasons including freeze protection (winterization), reduced viscosity, and keeping gas samples above their dew point. These can be critical for process accuracy, emissions compliance, and even plant operation.

Steam and electrically traced instrument tubing bundles represent lower installed costs and increased reliability for flow, level and pressure transmitters (as examples).

THERMON MANUFACTURES EVERY TYPE OF RESISTANCE HEAT TRACE AVAILABLE IN THE WORLD TODAY[1].

TubeTrace® with Self-Regulating BSX™
A cost effective solution for water freeze protection and low temperature maintenance.

Tube Temperature Range: 5°C to 65°C
Maximum Exposure[2]**:** 85°C power off

TubeTrace® with Self-Regulating HTSX™
Primarily used for process temperature maintenance or freeze protection where temperature exposure to steam purge is expected.

Tube Temperature Range: 5°C to 121°C
Maximum Intermittent Exposure[2]**:** 250°C power off

TubeTrace® with Self-Regulating VSX™
A high performance heat trace specifically for process temperature maintenance or freeze protection where high temperature exposure is a consideration.

Tube Temperature Range: 5°C to 150°C
Maximum Intermittent Exposure[2]**:** 250°C power off

TubeTrace® with Power-Limiting HPT™
A "cut-to-length" heat trace for higher temperature maintenance or for multiple tube bundles requiring high heat loading. Also used for freeze protection where high temperature exposure is a factor.

Tube Temperature Range: 5°C to 204°C
Maximum Exposure[2]**:** 260°C power off

The following are also available
TubeTrace® with Mineral Insulated MIQ heat trace
TubeTrace® with Parallell Constant Watt FP, and

Note . . .

1. Standard products are certified for use in ordinary (nonclassified) areas and in potentially explosive atmospheres in accordance with ATEX Directive and the IEC Ex Scheme.
2. Reflects maximum exposure temperature of heater.

SAMPLE TRANSPORT BUNDLES/UMBILICALS FOR CEMS AND ANALYSER SERVICE

Steam heated TubeTrace and ThermoTube preinsulated (non-heated) bundles also available for analytical applications.

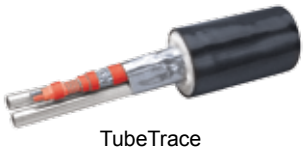
CUSTOM CEMS AND ANALYSER BUNDLES

Most countries require industrial furnaces and boilers to have emissions monitoring systems to verify proper operation of pollution controls. Extractive gas analysers require that the gas sample be kept above its dew point to remain a vapour from the probe to the analyser, sometimes significant distances. Similarly, process analyser lines require heating to measure process gas streams above their dew point.

Custom CEMS Umbilical
(with FAK 9L Bulkhead Shown)

ELECTRICALLY HEATED TUBETRACE:

- Hazardous area approvals.
- HPT power-limiting heat trace represents the best choice for maintaining temperatures above 150°C that can be "cut-to-length" in the field.
- To accurately sense temperatures in multiple locations, consider factory installed RTD, Thermocouple, or Thermistor temperature sensors.

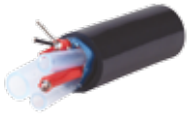


TubeTrace
with Power-Limiting HPT

NON-HEATED THERMOTUBE® AND "NI" NON-INSULATED BUNDLES ALSO AVAILABLE FOR ANALYTICAL APPLICATIONS.

Tube Bundle options can also include:

- Auxiliary conductors for probe heaters
- Unheated tubes for blow back and calibration gas.
- Special markings and identification, as required.



NI Bundle

CONTROLS AND MONITORING

To accurately control temperatures for electrically heated tubing applications, consider Thermon's TC control and monitoring systems. TC-systems are available with single-point or multi-circuit configurations and include ground leakage equipment protection, various alarm functions, and communications capabilities to host PC, PLC, and DCS systems.

TCM18 Controller (Shown)

FREEZE PROTECTION FOR HIGH TEMPERATURE STEAM LINES

TubeTrace® Type SEI/MEI - HT, HTX & HTX2

TubeTrace Type SEI/MEI - HT, HTX, and HTX2 electrically heated instrument tubing was developed to freeze protect high temperature steam lines. Though designed for freeze protection of condensates, super-heated steam samples can exceed 538°C during normal operation.

The most common requirement for these bundles is around the HRSG (Heat Recovery Steam Generator) found in combined cycle cogeneration stations. These bundles are not designed to maintain elevated temperatures.

TubeTrace Type SEI/MEI - HT, HTX, and HTX2 bundles are offered as Single Electrical Isolated (SEI) tube or Multiple Electrical Isolated (MEI) tubes, and are most often heated with HPT power-limiting heat trace. HPT has one of the highest continuous temperature exposure rating of any cut-to-length heat trace in the world today.

TubeTrace® Type SEI/MEI - HT
Maintain: 5°C down to -45°C
Continuous Tube Exposure: 399°C

TubeTrace® Type SEI/MEI - HTX
Maintain: 5°C down to -45°C
Continuous Tube Exposure: 593°C

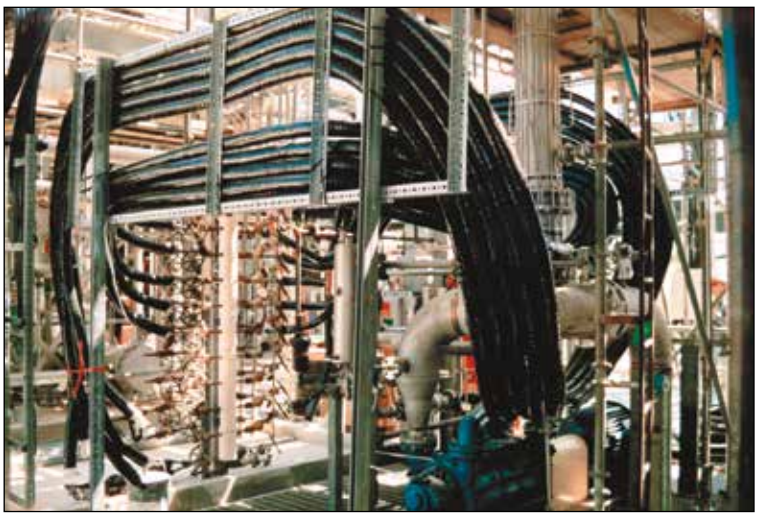
TubeTrace® Type SEI/MEI - HTX2
Maintain: 5°C down to -34°C
Intermittent Tube Exposure: Withstand 593°C

Thermon MIQ™ mineral insulated series heat trace is also available in TubeTrace SE/ME bundles and can be applied directly to a high temperature tube surface.

STEAM HEATED TUBING BUNDLES
TubeTrace® Type SP/MP and Type SI/MI

Steam or Fluid "Light Traced"
For freeze protection and lower temperature maintenance. The tracer tube is isolated from the process tube(s), so process tube temperatures will be significantly lower than the tracer tube temperature.

Tube Temperature Range: 5°C to 121°C
Maximum Tube Exposure *: 205°C



Steam or Fluid "Heavy Traced"
For freeze protection and process maintenance. The tracer tube is in direct contact with the process tube(s), so process tube temperatures will be very close to the tracer tube temperature.

Standard Tracer Temperature* Range: 5°C to 205°C
Maximum Tube Exposure *: 205°C

Type MP Shown,
(SP for "Heavy Traced" also available)

PREINSULATED TUBING THERMOTUBE®

ThermoTube® Type SL
Single tube preinsulated for steam supply, condensate return, or other unheated fluid or gas transport.
Continuous Temperature* Range: Service to 205°C

Type SL Shown

Type SL - HT
Maximum Continuous Tube Temperature*: 399°C

Type SL - HTX
Maximum Continuous Tube Temperature*: 593°C

Type SL - HTX2
Maximum Intermittent Tube Temperature*: 593°C

Type SL - HTX Shown

* Maximum tube temperature shown for standard bundle insulation thickness that keeps the outer jacket below 60°C. Tube Temperatures to 260°C possible.

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For the Thermon office nearest you visit us at . . . **www.thermon.com**

European Headquarters
Boezemweg 25 • PO Box 205 • 2640 AE Pijnacker • The Netherlands • Phone: +31 (0) 15-36 15 370

Corporate Headquarters
100 Thermon Dr. • PO Box 609 • San Marcos, TX 78667-0609 • USA • Phone: +1 512-396-5801

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