Thermon Heat Tracing Products & Services for Refining

Peter Baen... from San Marcos, Texas

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Thermon’s Vision is to be . . .

. . . Globally Recognized as The Heat Tracing Specialists®
Thermon’s Mission:

To Enhance our Customers’ Process Operations by Providing Innovative and Reliable Solutions at the Lowest Total Cost of Ownership.
But, what is Heat Tracing?

The application of heat (Steam and/or Electric) to pipes, tanks, instruments, surfaces and associated equipment.
Why Heat Trace?

- Winterization (Freeze Protection) & De-icing
- Prevent Condensation in Vapor Streams
- Frost Heave Prevention
- Reduce Viscosity
Common Industrial Applications

- Potable Water Lines
- Steam Supply & Condensate Lines
- Caustic Lines
- Crude Oils and Fuel Oils
- Process Instrument Tubing
- CEMS & Analyzer Lines
- Control Valve Manifolds
- Process Fluids
- Molten Sulfur
- Fire Protection
- Pump Manifolds
- Storage Tanks
- Frost Heave Protection
- Service Air and Water
- Safety Showers
Winterization Convenience or Necessity?

- Ruptured Pipes
- Loss of Safety Systems
- Interruption of Water Supplies
- Plant Outages
Electrical Heat Tracing
Mount Transformer and Control Panels
Run Conduit and Wire
Install Heat Tracing
Make All Terminations
Install Thermal Insulation
Test and Commission System
Electrical Heat Tracing Systems

- Positive Temperature Coefficient (PTC) Heat Tracing for Complex Piping
- Self-Regulating
- Parallel and Series Constant Wattage Heat Tracing for Interconnecting Piping
- Parallel Constant Watt
- Power-Limiting
- Series Constant Watt
- MI Constant Watt
- Specialty Heat Trace, Skin Effect Systems, Tank and Hopper Heating
- Skin Effect Heating
- Tank Heating
- Hopper Heating
Heating Element Performance

Graphically represented

PTC Self-Regulating & Power-Limiting Heater Output

ZTC Constant Wattage Heater Output

Power (W/m)

Pipe Temperature

0
Self-regulating Electrical Heat Trace

Complex Piping Within Process Units

**BSX™**
- Low to Moderate Temperature Maintenance & Winterization
- Max. Maintain Temp: 65°C
- Max. Exposure Temp: 85°C
- T-Rating: T6

**HTSX®**
- Temperature Maintenance and Freeze Protection
- Max. Maintain Temp: 121°C
- Max. Exposure Temp: 204°C
- T-Rating: T3

**VSX™**
- Temperature Maintenance and Freeze Protection
- Max. Maintain Temp: 150°C
- Max. Exposure Temp: 204°C
- T-Rating: T3

Maintain and Exposure Temperatures Determine EHT Selection
**External Tank Heating Systems**

- **Electrical Heating:**
  - FlexiPanel Pad-type heaters
  - Serpentined EHT

- **Steam Heating:**
  - HeetSheet (Plate-type Coil)
  - Field Applied Tubing

**Challenges** with *insertion* heaters
Over 70% of Refineries and Chemical Plants Indicate that Steam is Their Primary Means of Heat Tracing

Bare Tubing is 70% to 80% of All Steam Tracing
Steam Tracing Systems

Much more than what’s on the pipe...

- Lay Out Tracer Tubing
- Install HTCompound (if required)
- Install Supply and Return Lines
- Install & Test All Connections
- Install Thermal Insulation
- Commission System

Steam Tracer
- SafeTrace™
- BTS or bare Tracing
- Thermonized™ Tracing

ThermoTube® Preinsulated Steam Supply and Return Tubing

Trap Station

To Condensate Return Line

From Steam Header

Steam Supply Manifold

To Condensate Header

Condensate Return Manifold
With a Bare Tracer Total Heat Transfer Coefficient as our base-line, the “Thermonized” Trace has a Total Coefficient of ~ 10 X the “Ut” coefficient.

A Higher Heat Transfer Rate Allows:
- Fewer Tracers
- Lower Steam Pressures
- Higher Pipe Temperatures
- Stable Pipe Temperature During Ambient Swings
A) Fully Jacketed System
B) Thermonized Systems
C) Conventional Bare Tracing System
D) Conventional “Light Tracing” System
E) SafeTrace System

All performance based on 50# steam on 2” NPS insulated line
“Thermonized” Tracing Advantages

- Fast Heat-Up Capability
- Low $\Delta T$ from Tracer to Pipe
- Predictable Performance
- Even Temperature Distribution
- No Cross-Contamination Risk
- Cut-to-length (Pipe Dimensions Required for Full Jacketed Pipe)
- Standard Pumps & Valves can be used at Much Lower Cost
Selecting SafeTrace™ Isolated Tracers

Primary Application: Low to Medium Heat Requirements

**DLS- IT**
- **Uses:** Freeze Protection and Low Range Temperature Maintenance
- **Maintain Temp. Range:** 10°C to 55°C
- **Max. Exposure Temp:** 204°C
- **Max Steam Pressure:** 17 Bar

**SLS- IT**
- **Uses:** Freeze Protection and Low to Moderate Temperature Maintenance
- **Maintain Temp. Range:** 24°C to 93°C
- **Max. Exposure Temp:** 204°C
- **Max Steam Pressure:** 17 Bar

**BTS**
- **Uses:** Freeze Protection and Moderate Range Temperature Maintenance
- **Maintain Temp. Range:** 38°C to 121°C
- **Max. Exposure Temp:** 215°C
- **Max Steam Pressure:** 17 Bar

Maintain Temperature and Heat Loss Determines Tracer Selection
ThermoTube® Pre-insulated Tubing

... Reduces Installation and Operating Costs

Lower Labor Requirements Much Less than Field Installed & Insulated

ThermoTube is Easily Installed

Increased Life Expectancy
- UV Stabilized Extruded Jacket Protects Thermal Insulation

Sizes and Materials Available for Every Application Requirement
**Instrument Heating Systems**

- TubeTrace®
- Pre-insulated and Heated Tubing
- Additional Heat Tracing at Flange
- Available for Both Steam and Electric Heating

Heated and Insulated Instrument Enclosures (By Others)
Flue Gas (CEMS) & Process Analyzers
Pre-insulated & Heat Traced Tubing

TubeTrace® Pre-insulated & Heat Traced Tubing

Available in Steam & Electrically Heated Designs

- Predictable Performance for Accurate Temperatures
- Significantly Reduces Installation Time & Cost
No matter what your instrument tubing requirements …

**Contact Thermon!**
Microprocessor-Based Control and Monitoring Units

- Permit on-off heat tracing control with numerous capabilities
- Provide temperature monitoring
- Provide heating cable monitoring

Mechanical Thermostats

- Ambient sensing for ordinary and hazardous locations
- Pipe/tank wall sensing in a variety of temperature and amperage ranges for ordinary and hazardous locations
Ambient Proportional Control

How it Works

- **Power**
  - 100%
  - 50%
  - 0%

- **Control Band**
  - $t_{\text{maint}}$
**Why a Managed Heat Trace System?**

In an age of downsizing and outsourcing, many customers turn to Thermon for:

- Design & Complete Controls Solutions
- Installation & Supervision
- Maintenance & Trouble-Shooting

**Performance Guaranteed!**

If Thermon & Bright Technology provide a Turn-Key system, including thermal insulation, not only will the products & design be warranted, the maintain temperatures are also covered.
Thermon Heat Tracing Products & Services

Thanks for your time and attention!