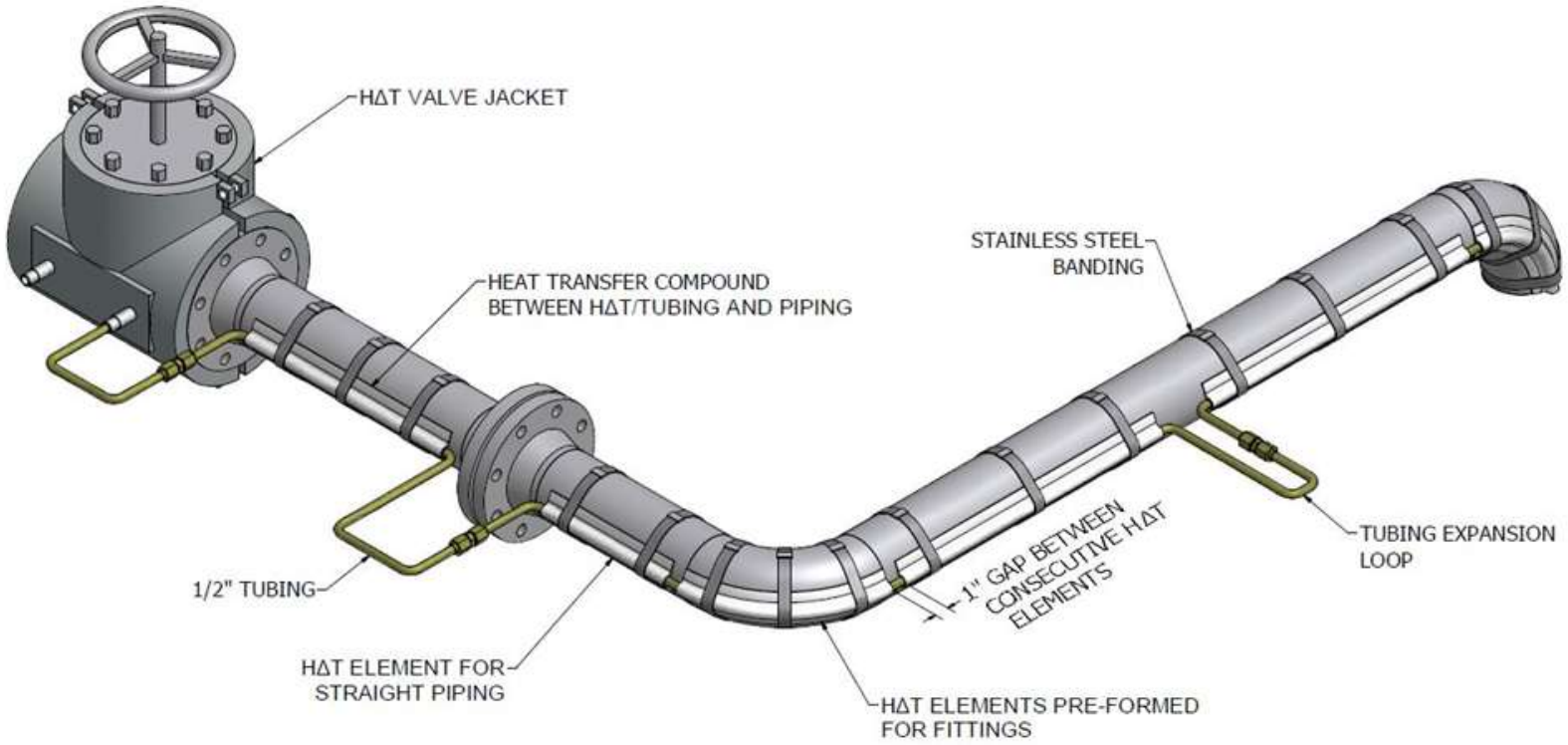
Engineered Thermal Maintenance Solutions: HΔT Tracing Enhancer

HΔT Maximizes the Output of Conventional Tube Tracing

- HΔT tracing enhancer maximizes the heat transfer from conventional tube tracing
  - 5X-10X increased heat transfer
- Aluminum cap for tube tracing
- Accommodates standard ½” tubing
- Features 2 ¼” arc length
- Radius of curvature matches pipe
- Installed with heat transfer compound
- Product provided as…
  - Straights: 5’ lengths; 100’ per box
  - Fittings: by piece count
  - HTC, banding, tubing, fittings

- Vent line from sour water feed tank
- A conventional tube tracing enhancer failed to prevent plugging & corrosion

- Number of HΔT tracing enhancers varies with:
  - Process properties
  - Flow conditions
  - Pipe size
  - Insulation
  - Ambient conditions



- **Pipe heating applications** where heating medium is more than 10 °C above the process temperature
    - Heavy Oil Applications:
        - Delayed Coker
        - SDS
        - FCC
        - Visibreaking
    - Amine Acid Gas
    - Acrylic Acid
    - Caprolactam
    - Chocolate
- Any **winterization** application requiring >1 conventional tube tracer

- CSI supplied 21km of HΔT for sub-critical and winterization applications
- CSI selected based on ability to deliver superior client value (technical and commercial)

HΔT Delivers Significant Commercial and Technical Advantages

Conventional Tracing Enhancer

HΔT®

Bare Tube Tracing

Vs. Conventional Tube Tracing Enhancer

- **Compared to conventional tube tracing enhancers, HΔT® advantages include:**
  - Superior thermal performance to prevent freezing and condensation
  - 2 ¼" contact area for heat transfer (vs. point to point)
  - Thin layer of HTC maximizes effectiveness
  - Tubing held firmly against piping
  - Lower capital expense
  - Lower operating expense

Vs. Bare Tube Tracing

- **Compared to bare tube tracing, HΔT® advantages include:**
  - Superior thermal performance to prevent freezing and condensation
  - 2 ¼" contact area for heat transfer (vs. point to point)
  - Enables use of less tubing, fewer manifolds/traps
  - Lower capital expense (infrastructure)
  - Lower operating expense (energy and maintenance)