



> TraceBOOST™ Installation Guide

Application Overview

TraceBOOST™ is intended for pipe heating applications which feature a large temperature difference between the heating medium (i.e., steam) and the process.

Ideal applications have the following characteristics; maintaining bulk or average process temperature and the temperature difference between the heating media and the process temperature exceeds 70°F (40°C).

Applications with less than 70°F (40°C) temperature difference between the heating media and the process temperature or applications that require uniform pipe wall temperatures should consider a CSI ControTrace engineered heating system.

TraceBOOST Tracing features a 2-inch wide enhancer which significantly improves the heat

transfer from conventional ½-inch stainless steel or copper tube tracing. Heat transfer compound (HTC) is used to ensure good conductive heat transfer between the tubing, **TraceBOOST** element, and piping.

TraceBOOST enhancers are provided in straight lengths for piping and pre-formed pieces for fittings.

The number of **TraceBOOST** tracers required for a given piping system is dependent upon the heating medium, pipe material, pipe size, insulation, and ambient conditions. If your plant standards already specify the number of conventional tube tracers use the conversion table below to determine the equivalent number of **TraceBOOST** tracers.

Specified Conventional Tube Tracers		Suggested TraceBOOST Tracers
Carbon Steel Process Pipe	Stainless Steel Process Pipe	
2-3	2	1
4-7	3-5	2
8-10	6-8	3
11-14	9-11	4

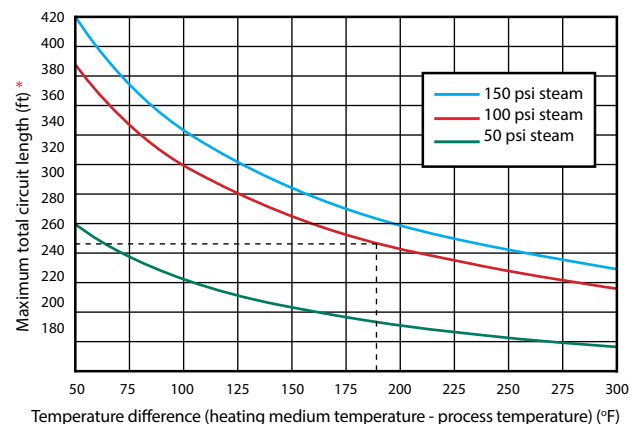
When no plant standard exists or for large projects contact factory for design services.

Maximum Circuit Length

Total tracer length should conform to circuit length calculations on right, to prevent excessive pressure loss in the heating medium:

1. Subtract the process maintain temperature from the steam temperature.
2. Find the result along the bottom.
3. Follow it up to the intersection with the appropriate steam pressure.
4. The maximum total circuit length is found on the left.

Chart 1: Indicates Maximum Total Circuit Length Calculations with a 10% pressure drop
TraceBOOST Maximum Circuit Length



* Maximum circuit length includes: supply, tracing and return.

Max. Circuit Length (Cont'd.)

Example:

If your plant standard to maintain a 150°F process line with 100 psig steam is five ½" tube tracers then:

- From Table 1 use two **TraceBOOST** tracers.
- The temperature of 100 psig saturated steam is 338°F. The difference between the process temperature and the steam temperature is 188°F (338°F – 150°F = 188°F).
- The total circuit length is 265'.

Circuit Layout

Steam Supply & Condensate Return

When laying out the tracing runs, it is best to run the tracing from a high elevation in the piping system to a low elevation without intermediate pockets. Tubing should be run in parallel and in direct contact with the process piping as shown in *Figure 1*.

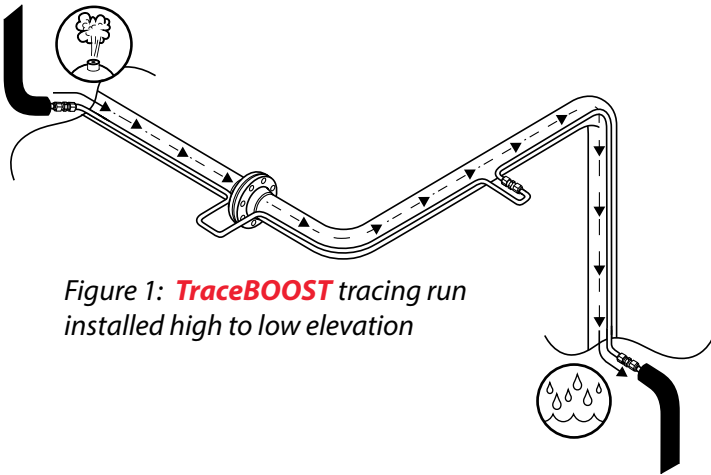


Figure 1: **TraceBOOST** tracing run installed high to low elevation

Tracer Location On Piping

Typically, tracers should be located at the 3, 6, 9, or 12 o'clock positions around the pipe circumference as shown in *Figure 2*.

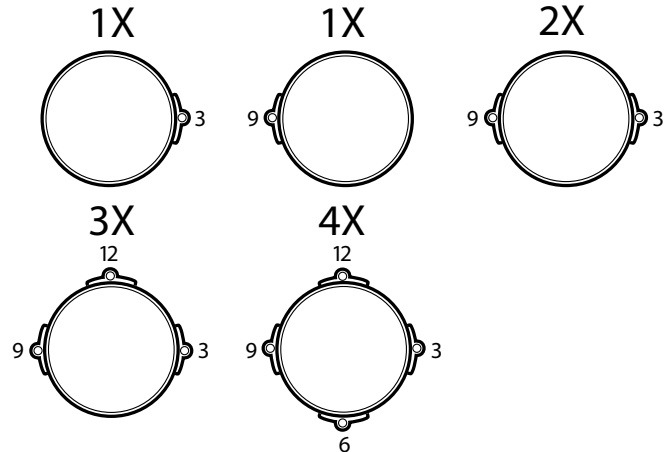


Figure 2: Typical **TraceBOOST** tracing positions on piping.

For piping which requires only 1 or 2 **TraceBOOST** tracers, the 3 and 9 o'clock positions are best for avoiding potential interferences with pipe supports, high-point vents, and low-point drains.

Running Tracers Past Flanges

When running tracers past flanges, the tubing should be formed to allow the **TraceBOOST** enhancer to fit within 2 inches of the back of a slip-on flange or within 1 inch of the back of a weld-neck flange. See - *Figure 3*

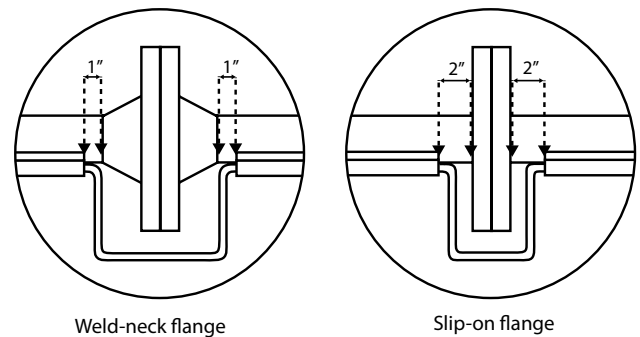


Figure 3.

Expansion Loops

The Placement Of Expansion Loops Is Critical To The Effectiveness Of The Tracing System.

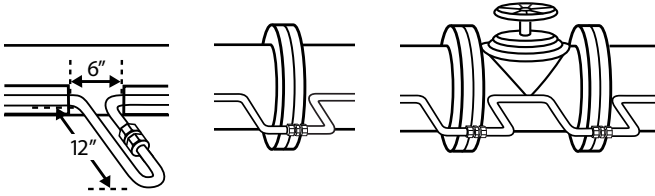


Figure 4a: Flange jumpers act as expansion loops.

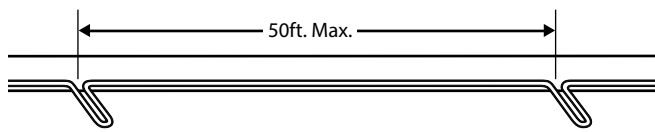


Fig. 4b: The maximum distance between consecutive expansion loops is 50ft.

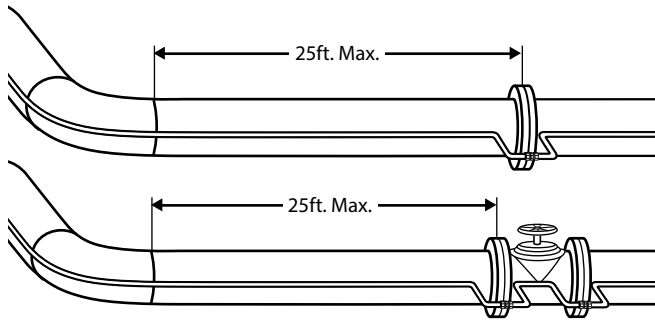


Fig. 4c: The maximum distance between a change in direction and an expansion loop is 25ft.

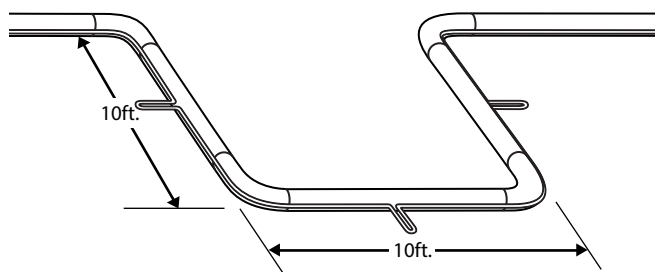


Fig. 4d: The maximum distance between consecutive direction changes without an expansion loop is 10ft.

General Install Overview

1. Clean process pipe.
2. Temporarily position ½-inch tubing along the piping.
3. Dry fit **TraceBOOST** enhancers and cut to fit as required.
4. Apply HTC to **TraceBOOST**.
5. Install **TraceBOOST** over the tubing and permanently secure to the piping.

Valves & instruments are best heated with a **TraceBOOST** jacket.

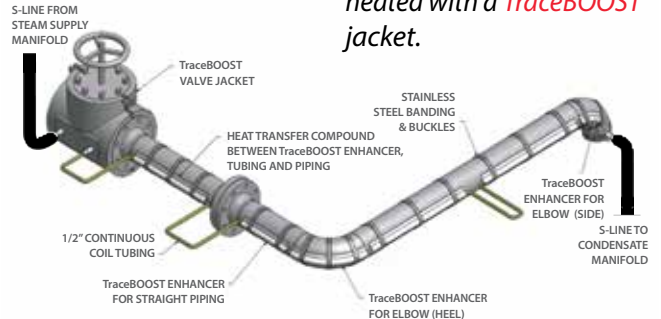
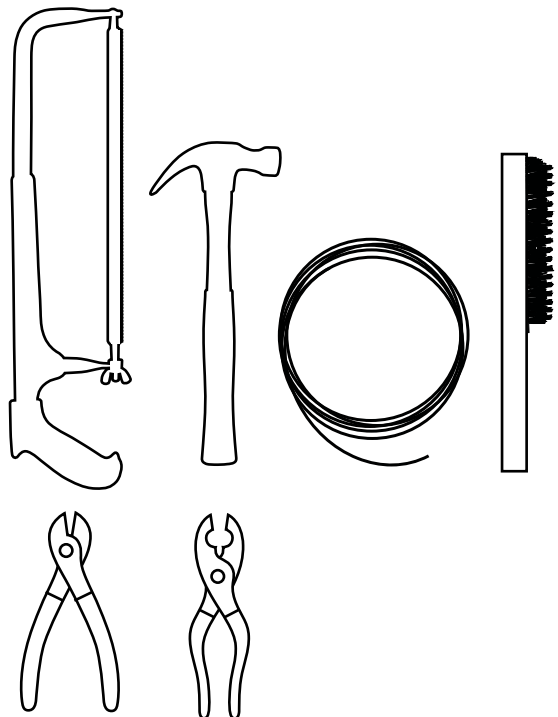


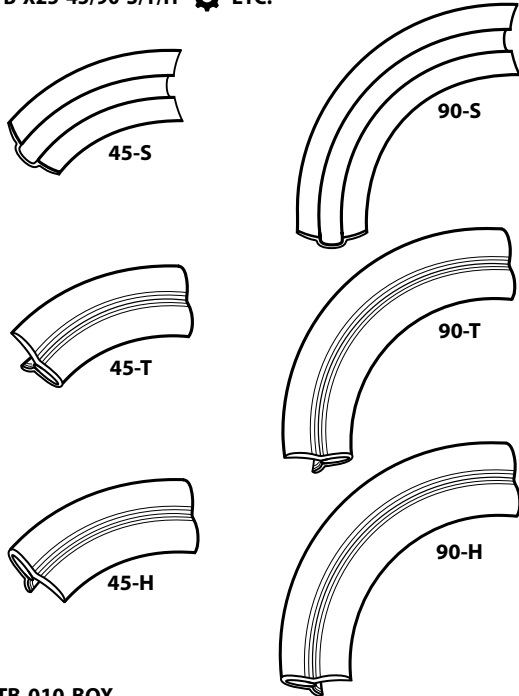
Figure 5: Example of completed **TraceBOOST** tracing system

Installation Tools



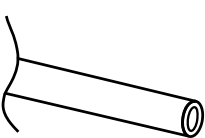
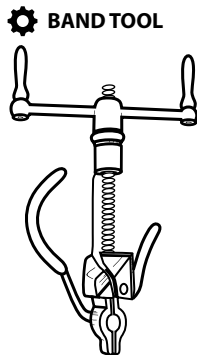
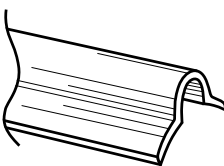
Part Numbers

- ⚙ TB-X09-45/90-S/T/H ⚙ TB-X30-45/90-S/T/H
- ⚙ TB-X15-45/90-S/T/H ⚙ TB-X40-45/90-S/T/H
- ⚙ TB-X20-45/90-S/T/H ⚙ TB-X60-45/90-S/T/H
- ⚙ TB-X25-45/90-S/T/H ⚙ ETC.

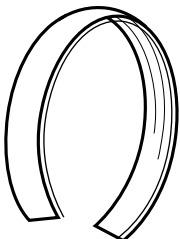


- ⚙ TB-010-BOX
- ⚙ TB-020-BOX
- ⚙ TB-040-BOX
- ⚙ TB-080-BOX

- ⚙ BCA4
- ⚙ BCB4
- ⚙ BCD4
- ⚙ BCE4
- ⚙ BCF4
- ⚙ BCM4



⚙ BUCKLE-SS-07-100



⚙ BAND-SS-07-100



⚙ HTC-C-GAL



⚙ TB-PTYKNIFE

Clean All Surfaces

Before application of tubing, all piping and surfaces that will be in contact with HTC should be cleaned of loose dirt or other coarse debris.

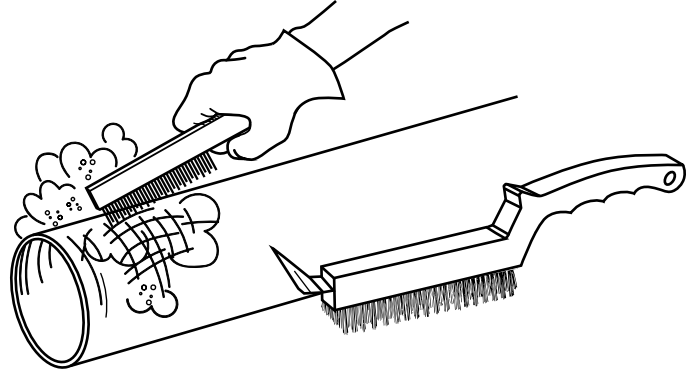


Figure 6: Clean surfaces with wire brush

Temporary Tubing Support

Tubing should be temporarily held in place on the piping using readily available wire (16-gauge rebar tie wire is a good choice). Secure the tubing every 8-10 feet on straight runs, at the midpoint of every elbow, and on either side of each expansion loop or flange.

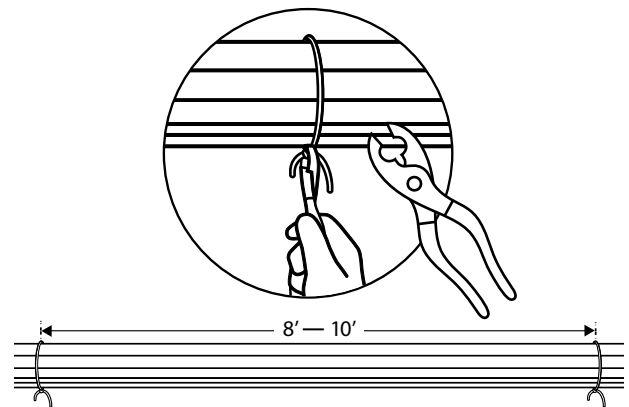


Figure 7: Secure with wire hanger every 8'-10'

Dry Fit TraceBOOST

Prior to applying HTC, the **TraceBOOST** enhancer should be placed over the tubing to confirm fit.

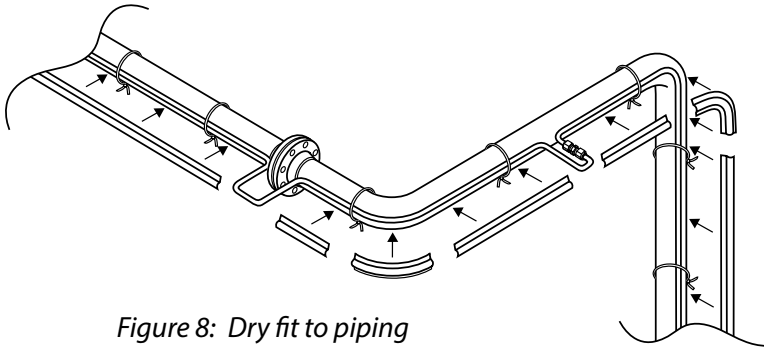


Figure 8: Dry fit to piping

There should be a small gap (approximately 1 inch) between consecutive **TraceBOOST** enhancers along the tubing. Straight sections of **TraceBOOST** should be cut as needed to accommodate this fit.

Enhancers can be easily cut using a hacksaw, portable band saw or reciprocating saw.

Apply HTC

Application of CSI Grade-C HTC is critical to ensure good heat transfer between the tubing, **TraceBOOST** enhancer and piping.

Remove HTC from the can using the (flat edge) of the HTC Tool and apply to the concave side of the **TraceBOOST** enhancer completely filling the voids.

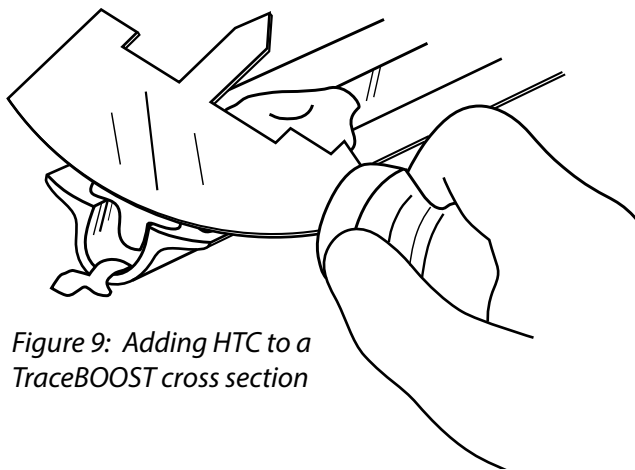


Figure 9: Adding HTC to a TraceBOOST cross section

Apply HTC Continued

Use the (grooved edge) of the HTC Tool to remove HTC from the center channel for tubing as shown in Figure 10.

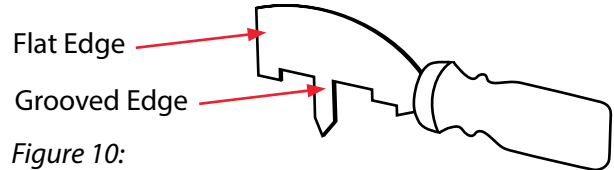


Figure 10:
HTC application tool

For greater ease of application, it is recommended that HTC can be stored at room temperature.

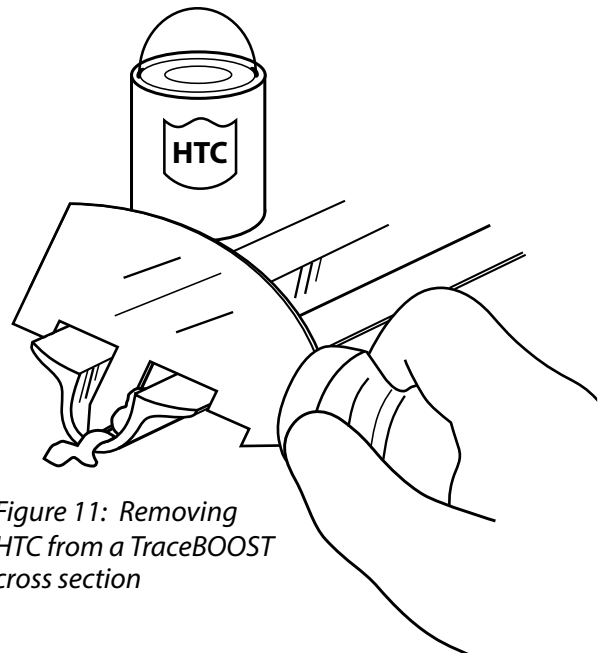


Figure 11: Removing
HTC from a TraceBOOST
cross section

Fasten TraceBOOST

Installation should begin at an elbow near the middle of the tubing run and proceed towards each end of the run. This approach minimizes any build-up of tubing which would result in poor fit between the tracing and piping.

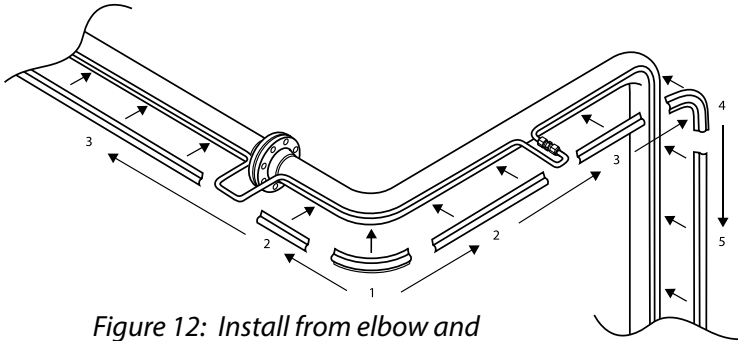


Figure 12: Install from elbow and proceed toward the end of the run

Remove Retaining Wires

Before positioning the **TraceBOOST** over the tubing, the temporary tie wires should be removed for the section of tracing being installed.

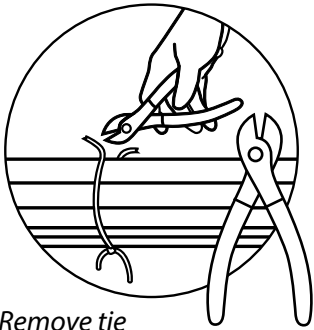


Figure 13: Remove tie wires with wire cutters

Press the **TraceBOOST** enhancer over the tubing until it touches the piping. Some HTC should squeeze out from underneath the **TraceBOOST** during the installation. Once installation is complete, excess HTC can be returned to the can for reuse.

All the **TraceBOOST** Tracing (around the pipe circumference) should be installed for a given 5-foot section of piping before moving to the next section of piping in the system.

Secure With Steel Bands

After all **TraceBOOST** enhancers are pressed onto the piping for a given section, the **TraceBOOST** tracing must be secured to the piping using $\frac{3}{4}$ -inch stainless steel bands. Each 5-foot section of **TraceBOOST** tracing should use three bands as shown below.

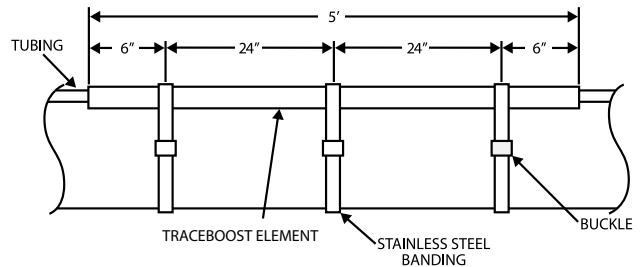
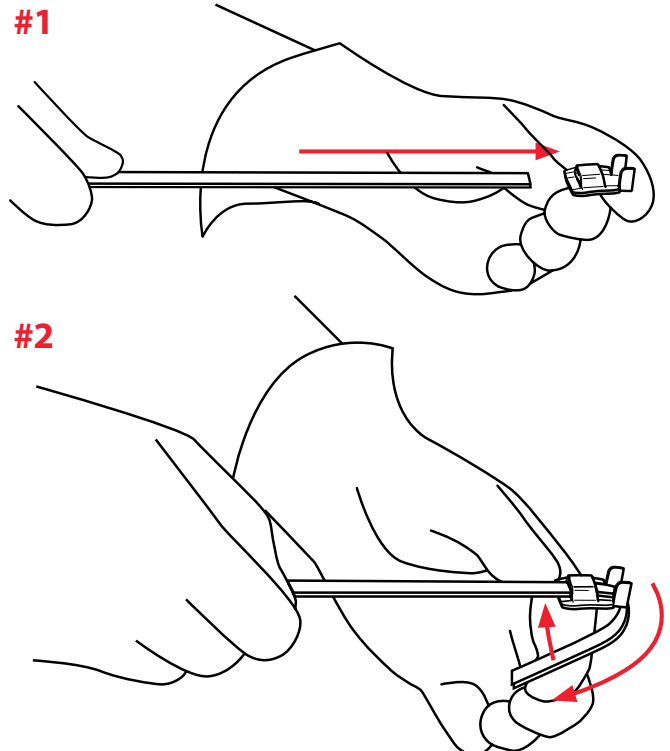


Figure 14: 5' section with three bands

Similarly, pre-formed **TraceBOOST** pieces for fittings should be secured with a minimum of three bands. Additional bands should be used as needed to ensure a good, tight fit between the **TraceBOOST** tracing and the piping.

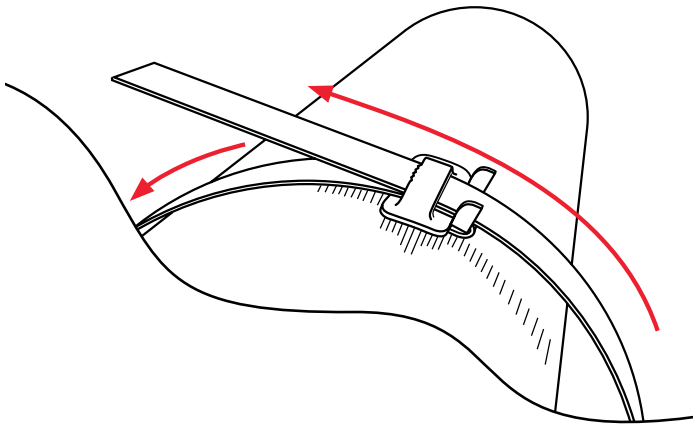
Band Installation Steps



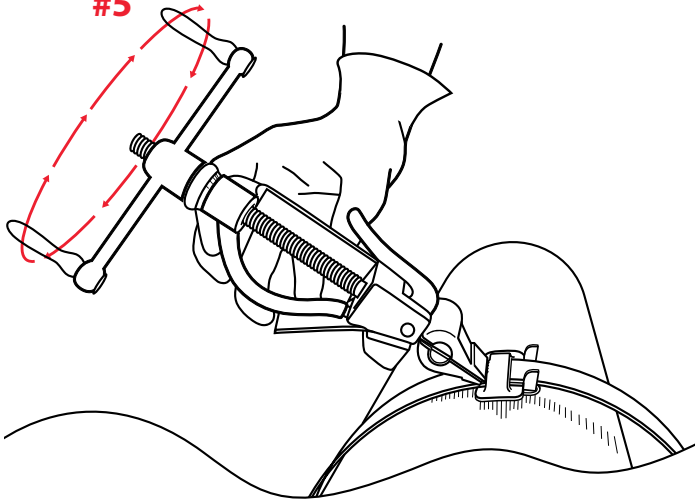
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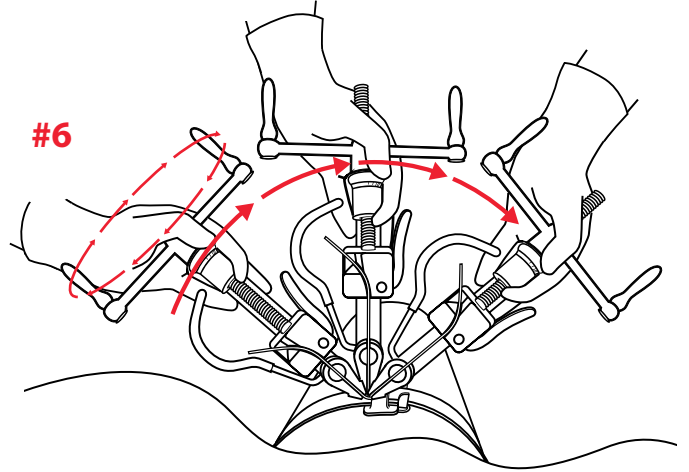
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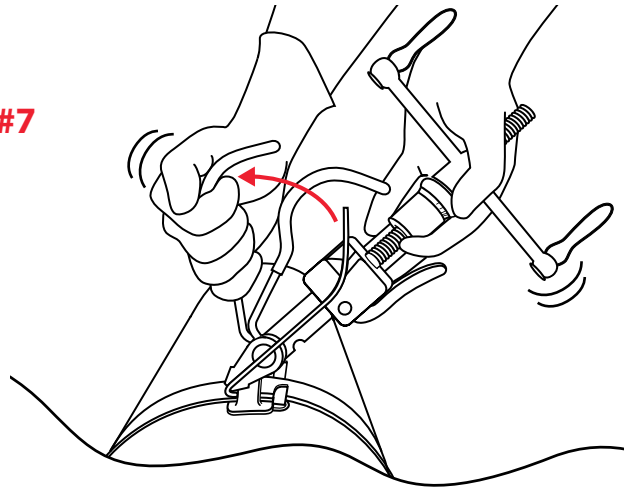
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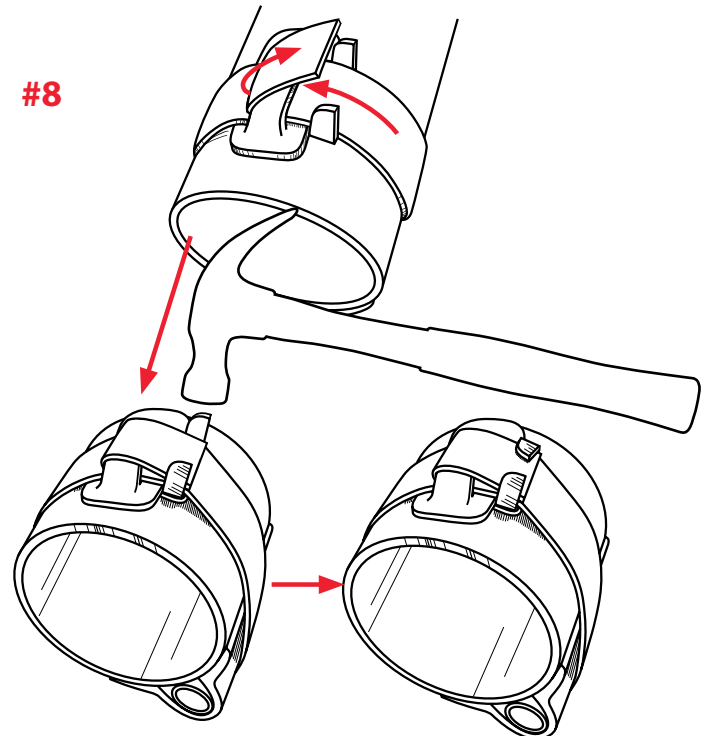
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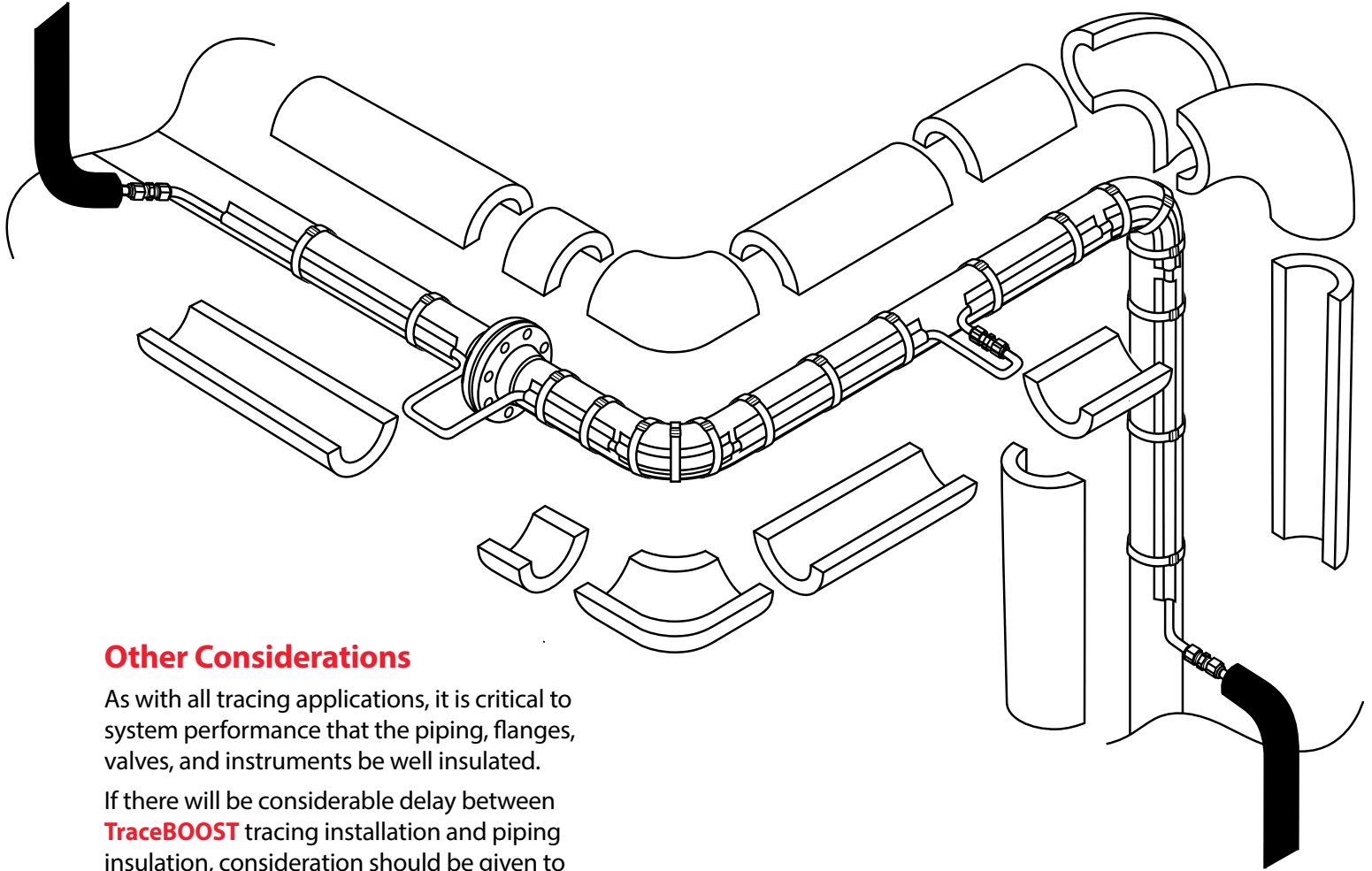


#8



FINISHED INSTALLATION

(Insulation By Others)



Other Considerations

As with all tracing applications, it is critical to system performance that the piping, flanges, valves, and instruments be well insulated.

If there will be considerable delay between **TraceBOOST** tracing installation and piping insulation, consideration should be given to covering the piping with temporary weather protection until insulation is completed.

Each end of the **TraceBOOST** tracing runs must be connected to the heating medium supply/return manifold. O'Brien S-Line ½-inch pre-insulated tubing is recommended. Generally the length of steam supply tubing should not exceed 100 feet.

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