



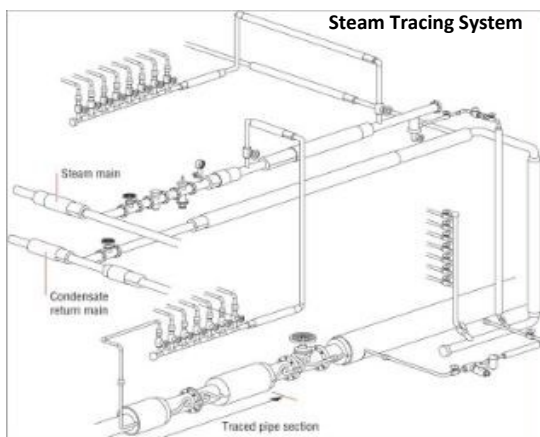
Steam Tracing Tips

Industrial plants require a method to keep the process fluids flowing during operation as well as prevent critical components from freezing in low ambient temperature climates.

Steam tracing systems perform two very important functions in an industrial plant:

1. They replace heat loss from the process fluids in the system due to poor insulation or leaking components, thus keeping the process fluids flowing.
2. They prevent any system from freezing in low ambient temperature climates.

The negative effects of poor design and installation can be catastrophic to reliability, production and operation, which ends up costing the plant downtime and maintenance dollars. Therefore, steam tracing is a key component in maintaining a reliable, efficient production operation.



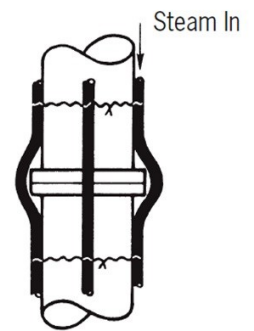
Today's steam tracing systems use the latest technology in components and design standards. Using the medium- or high-pressure condensate return system designs provides a highly energy-efficient thermal cycle. With proper design, along with today's technologies, we should expect no component failures within six years of operation any steam component today.

Vertical Tracing

A single tracer on a vertical or nearly vertical process line can be spiral wrapped. Multiple tracers on vertical lines should be spaced for the most efficient heat transfer.



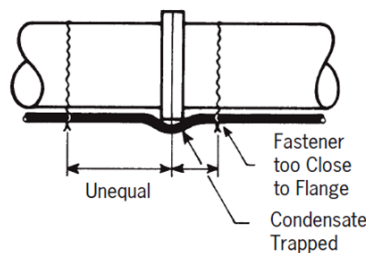
Single Tracer; Spiral Wrapped



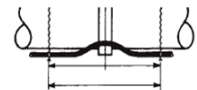
Multiple Tracers; Equally Spaced

Horizontal Tracing

Horizontal lines with 1/4" OD tracers should be fastened every 1-1/2 feet, while 1/2" OD tracer lines should be fastened every 2 feet. Fasteners should be equally spaced on each side of flanges. Always use a large radius bend around the flange on a flat plane so that the loop is not below or above the level of the horizontal run.



Wrong Side View



1/4 in. OD – 1 1/2 Ft.
1/2 in. OD – 2 Ft.

Right Top View



Fitting components

When installing tube fittings for steam service, the following precautions should be taken:

1.) Material should be based on pressure, temperature and environmental conditions. Both tubing and fittings must have compatible thermal properties. Copper tubing is cheap, and if corrosion occurs, scale and contaminants will run downstream to coat traps or damage instruments creating a higher cost maintenance issue. For this reason, stainless steel is the preferred option for tracer material.

2.) Steam should be considered a gas for purposes of tubing wall thickness. Heavier wall tubing is preferred because the thicker wall gives improved performance during a cool down period from full steam temperature and increases thermal cycling ability. It is during that time that thin wall tubing tries to shrink away from the fitting. Once this occurs, any scratch becomes a potential leak path.

3.) Deep scratches or gouges of tube OD must be avoided, particularly from handling the tubing. A very slight steam leak through such a defect will become a larger leak as erosive steam etches a deeper valley in the tubing.



4.) If steam temperatures are above 400F (204C) consider using a high temperature thread lubricant on fitting nut threads. This should offer some help when you need to disassemble tubing and eliminate galling of the threads.

Some points about steam and tracing . . .

Steam is one of the most erosive of system fluids and unless water chemistry is carefully controlled, corrosive inclusions add to the erosive properties and make steam a tough fluid to handle.

- Always supply steam to tracers on the high end of a sloping process line to prevent backup of condensate.
- As a general guide, small tracers (1/4" OD and 3/8" OD) should not exceed 60 feet, and the limit for 1/2" OD and above tracing should be 150 feet.
- Due to the rising cost of energy, one of the key areas the plant needs to focus on is the tracer system's reliability and energy efficiency.
- The high usable heat content of steam offers many benefits over the use of thermal fluids for tracing and can be significantly more efficient than electrical tracing.
- As steam is primarily made of water, it has a low impact on the environment in the event of leakage to the atmosphere. It has been estimated that cleaning up a one-liter spill of glycol can cost up to \$5,000.00. This cost includes the cleanup, reporting, and documentation required when a spill occurs on an industrial site. Steam is intrinsically safe, which makes it the practical choice for most industrial applications where ignition sources must be minimized.
- For these reasons, the use of steam tracing is still the preferred choice for temperature maintenance in most industrial and process applications.

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