TECHNICAL
EDUCATION
ACADEMY

School of Engineering

COURSE PROGRAMME

000571

ELPO005 - Heat Tracing System

The term heat-tracing refers to the continuous or intermittent application of heat on the piping, equipment, and instrumentation where fluid (water or other product) may be exposed to low temperature/freezing conditions.



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Course overview

Foundation level

Why take this course

The term heat-tracing refers to the continuous or intermittent application of heat on the piping, equipment, and instrumentation where fluid (water or other product) may be exposed to low temperature/freezing conditions. Whenever the contents of a pipe or vessel are maintained at temperatures exceeding the ambient temperature, there will be a flow of heat from the product to the external air. Insulation will slow the heat loss, but will not prevent it. Heat tracing is a method to provide the supplemental heat just enough to compensate for the heat loss due to lower ambient temperature.

The general intent of heat tracing is either tracing for winterization and/or tracing for process maintenance. Winterization tracing is designed to protect the product from freezing and is typically designed to operate when the ambient temperature falls below a certain level; commonly 40°F to 50°F. Heat tracing for process maintenance is commonly used where higher temperatures must be maintained for the purpose of reducing product viscosity and/or preventing wax or hydrates from forming in the product. The design is more complex compared to freeze protection in a way that additional heater circuits and more specialized controls may be needed.

Sometimes, heat tracing is used for raising the temperature of a product following short shutdown periods, but this is not the primary objective. Heat tracing can be accomplished through several methods, including electricity, steam, glycol, and even hot oil. However, for the majority of applications, the choice falls between electric and steam tracing.

This training course presents an overview of heat tracing systems and describes the criteria for selection.

Who it is for and how it helps

This course is applicable to mechanical, electrical and process engineers, operations & maintenance personnel, as well as consultants and contractors who construct, build and manage facilities.

What you will learn

- Explain what is heat tracing and where it is used
- List different types of heat tracing systems: electric, steam, hot water
- List the advantages and limitations of constant watt, parallel circuit, self regulating and skin type heating
- Use control techniques: ambient air sensing or line control for optimum energy efficiency
- Use the power supply, protection and safety devices
- Understand various codes and standards governing the design and installation of electric heat tracing
- Understand three types of steam heat tracing systems: external tube tracers, cemented tracers and fully jacketed pipe
- Understand the do's and don'ts of steam tracing

Course overview — continued

- Learn step-by-step approach for estimating the heat loss and selection of an electric heat tracing system
- Learn the key factors affecting the selection of heat tracing systems
- Learn the factors favoring and against the application of electric and steam heat tracing systems

Curriculum

Modules 01–04

01 Overview of Electric Heat Tracing

- Types of electric heat tracing systems
- Series circuit mineral insulated (MI) cables
- Parallel circuit heating cables (constant watt output)
- Self-regulating heating cable
- Skin effect heat tracing
- Selection & sizing of appropriate electric tracer
- Temperature control & safety

02 Overview of Steam Heat Tracing

- External tube tracers
- Cemented tracers
- Jacketed piping
- Steam tracing design considerations
- Steam tracing installation tips

03 Estimating Heat Tracing Requirements

- Heat loss
- Empirical method of estimating heat loss
- Select cable type and output rating
- Quantifying the circuits

04 Selection Criteria for Heat Tracing Systems

- Factors affecting the selection of heat tracing solution
- Factors favouring electric tracing
- Factors against electric tracing
- Factors favouring steam tracing
- Factors against steam tracing

Participation and contacts

Joining the programme

Contact the Academy and quote course code 000571 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
www.tecedu.academy

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