



Mondi Štětí a.s.

STANDARD

Part 13.01.10

TECHNICAL SPECIFICATION FOR

HEAT TRACING

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TECHNICAL SPECIFICATION FOR

HEAT TRACING

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1 General

This standard presents heat tracing of piping, tanks and instruments used in the project.

This standard gives general instructions for design, installation and documentation.

The purpose of heat tracing is to maintain or raise the temperature of pipes and equipment. Heat tracing can be used to protect pipes from freezing, too.

Heat tracing shall be performed by electrical trace heating.

The pipe is usually covered with thermal insulation to prevent heat losses from the pipe. See Insulation standards ST 14.01 and ST 14.02.

If discrepancies exist between drawings, specifications and erection instructions, the Purchaser will decide which documents are valid.

2 Pipelines with heat tracing

The piping of following flow substances shall to be equipped with electrical trace heating:

- Black Liquor Firing (BLF)
- Black Liquor-heavy (~ above 50 %) (BLH)
- Foul Condensate (WCF)
- Soap (LSP)
- Small pipelines outdoors with periodically low or no flow e.g. following flow substances:
 - Potable Water/Drinking Water (WP)
 - Chemically Treated Water (WET)
 - Weak Black Liquor (BLW)
- Piping of emergency showers
- Other pipelines shall be agreed case by case

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3 General design principles

Each trace heating application imposes unique demands on the designer to achieve the desired temperature and maintain it within the specified conditions. Trace heating systems necessarily interface with other specified items of equipment such as thermal insulation and the electrical supply available to power the system. The final system will be an integration of all these component parts so the values of these interface items have to be known and controlled in order to design systems that will perform as required.

The design shall conform to all IEC requirements for the use of electrical equipment.

Where trace heating systems are to be installed in explosive gas atmospheres, full details of the hazardous area classifications (IEC 60079-10) shall be specified. The specification shall state the zone (1 or 2), gas group IIA, IIB or IIC) and temperature classification in accordance with IEC 60079-0. Where special considerations apply or where site conditions may be especially onerous, these conditions shall be detailed in the trace heating specification.

Equipment manufacturer's instructions shall be followed.

Heat losses shall be calculated according to equation 2 of standard EN 60079-30-2.

The circuit shall be equipped with temperature control that is controlled by a sensor located on the heated workpiece or a system measuring the ambient temperature.

Different pipe sizes shall be designed to be heated with separate electrical tracing circuits.

The requirements of the maintenance of process equipment shall be observed in the design of electrical tracing circuits.

Self-regulating heating stripes Raychem or ISOPAD are standard. Heating stripe type and the use of thermostats depends on individual cases of usage and it is necessary to clarify it with the Supplier.

Only if the increased output is required, heating stripe is wound around on the piping. In case of piping bends, the heating stripe is laid on their external side.

In case of flanges, it is necessary to make a loop of length ca. 0.5 m. This should be fixed around the flange in order to avoid eventual thermal losses.

In case of armatures, loop is sufficiently long ca 1 m. It is necessary mind that flat side of the heating stripe is in the tight contact with the valve body.

Armatures wrapping must be executed in such way, that their eventual exchange was possible without damaging of the heating stripe.

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4 Installation

Each electric trace heating system is designed to meet the requirements of the particular process and plant. Because the system comprises a number of components integrated at the site. It is necessary to ensure that the plant parameters on which the design is based are still valid when the trace heating system is installed, and that the components are installed correctly. Appropriate testing and maintenance are essential in order to ensure satisfactory performance and safety.

Installation of the trace heating system should not begin until all piping runs and pieces of equipment have been pressure-tested and all related instrumentation has been installed. The workpiece surface on which the trace heater is to be installed should be free from rust, grease, oil, etc. Any sharp protusions such as weld splatter, cement splash, etc., should be removed. All coatings or finishes applied to the heated surfaces must be suitable for the intended duty. The installation of the trace heating system should be coordinated with the workpiece, thermal insulation and instrumentation work in order to ensure a scheduled completion date. Scheduling for the installation of thermal insulation should not occur until the electrical trace heating has been completely installed and tested.

The equipment on site to be traced should be verified such that the length of piping and the number of vessels, valves, flanges and components agree with the design drawings. The amount of trace heating depends on the numbers of these items. Whenever a change is made to the equipment to be traced, the schedule of trace heating materials must be reviewed.

Equipment and accessories related to the heating system shall be so installed as to ensure minimum disturbance to operation and maintenance and prevent them from being damaged during maintenance.

Whenever possible, connection boxes, thermo-stats, fault current switches and other equipment of the tracing system shall be placed so as to be accessible from the ground and service platforms.

There should be no insulation material between the heated workpiece and tracing cable.

The heating stripe is fixed to the piping, by using the cable nylon fasteners (allowed up to 100°C) ca. every 30 cm.

Protecting mesh of the heating conductor must be connected to the potential of the protecting conductor.

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Heating stripes must be equipped by the connecting or end device.

Cable entries through thermal insulation shall be located in the lowermost point to prevent water drainage through the entry.

Cables shall be protected with a metal hose at the point of entry to prevent cable damage.

Heating stripe and piping are wrapped by the aluminum foil of thickness 0.1 mm.

Heated piping must be marked by label "electrically heated - elektricky vyhrievané" at intervals ca 3 m on the sheathing of the thermal insulation.

Installation shall comply with the manufacturer's instructions. Installation accessories shall be approved for use with the tracing cable in question.

5 Supervision

All accessories shall be visually inspected before installation.

Before installation, the correct tracing cable type shall be checked on the basis of the markings on the cable. Further, cables that have no permanent type markings on their sheaths shall be meggered.

The insulation resistance of the tracing cable shall be measured with a 500 V DC insulation resistance meter before and after installation and after insulation. It shall be at least 200 MΩ. The measurement point shall be between the conductor and metal sheath.

The heating circuit shall be activated and checking whether the heating stripe is warmed in its full length.

Care shall be taken during installation to ensure that tracing cables are installed according to instructions and regulations.

An installation inspection shall take place and records shall be kept of the inspection on the inspection record form.

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6 Documentation

Enquiry will include the following basic data for all the heated subjects in question:

- Pipe length
- Pipe diameter
- Flow substance
- Pipe material
- Tank dimensions
- Valves, pumps and other equipment
- Quantity of pipe supports
- Control and limiting temperatures
- Design temperature of the heated subject
- Maximum temperature to which the tracing cable is exposed
- Min./max. ambient temperature
- Insulation material and thickness

and electrical data:

- Voltage with variation limits
- Atex classification
- List of the available cable types and quantities
- Required control system
- Degree of protection, type and location of the electrical tracing panel
- Cable types and design lengths for supply and control cables
- Types and quantities of cable trays and protective pipes to be built
- Types and quantities of supply point boxes

and additional information:

- Markings of field and panel equipment
- Pipe markings
- Required documentation

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