

A heated debate

Ralph Hillesheim explores the role of trace heaters in process engineering

A trace heater with heating tapes, heating cords and heating cables is used wherever uniform process heat is required. Electrical trace heaters achieve temperature regulation of pipes, containers and moulds and cover a temperature range of 0°C to 1,000°C.

Hillesheim offers different types of trace heaters. The HBR self-limiting heating tapes (HBR-ILx) are used up to a temperature of 120°C. As a result of their semiconductor structure, these heating tapes reduce their power output when they heat up and can therefore be used without control technology. The outer jacket usually consists of polyolefin. A fluoropolymer or PTFE outer jacket is often an option reverted to in the chemical industry.

These heating tapes can always be cut to size, which makes them ideal for in situ installation. Connection and termination is achieved with a configuration set available in shrink fit or screw technology. ATEX-approved configurations also allow the use of these heating tapes in explosion-hazard (Ex) areas.

Parallel heating tapes (HKS) have no self-limiting properties, deliver a constant output of 70W per meter and are suitable for temperatures up to +150°C. The parallel heating tapes from Hillesheim are based on Integral technology and thus require no sensor. The Integral control system (HTI) uses the heating wire as the sensor. Temperature measurement is not at one point, as with a sensor, but rather over the entire length of the heating tape. This offers many advantages, especially in surface heating. These heating tapes can also be configured in situ.



The HS heating tape is used for temperatures above 250°C

The heating tapes and cords based on PTFE (HST) provide an output of up to 100W per meter and are suitable for heating larger containers and pipes. Their PTFE structure makes them moisture-proof (protection type up to IP54) and deployable up to a temperature of 250°C. A bend radius of 6-10mm guarantees flexible routing even with difficult contours. The heating tapes consist of a PTFE heating conductor, which is additionally covered by a metal braid. The metal braid raises mechanical stability and ensures improved heat transfer to the heated pipe or container.

Heating tapes with fabric insulation (HB, HS) are used for temperatures above 250°C. These high-temperature heating tapes can attain an output of up to 350W per metre. Fibreglass is used for insulation at a maximum temperature of 450°C and quartz fabric up to 900°C. Here too, a bend radius of 6-10mm guarantees high routing flexibility.



The HIL heating cables are for use in corrosive environments

HARSH ENVIRONMENTS

The mineral-insulated heating cables (HIL) with metal jacket were developed for especially corrosive and damp environments. Thanks to the welded metal jacket, these heating cables meet IP67 protection requirements and are therefore watertight, oil-tight and gas-tight. The heating cables with stainless steel jacket attain an output of 250W per meter and are suitable up to a temperature of 800°C. For temperatures of up to 1,000°C, the stainless steel jacket is exchanged for an Inconel jacket, allowing the top temperature range to be covered. Metal screw connections are used here, which may be located in a connection housing. Bend radii of 12-30mm are also very good ratings that guarantee flexible routing.

Constant and precise process heat is imperative for many applications today and a prerequisite for a smooth process flow. The electrical trace heaters, with their broad diversity, offer a suitable solution for all applications and environments. ■

For more information at www.engineerlive.com/process

Ralph Hillesheim is with Hillesheim.
www.hillesheim-gmbh.de