Electrical heat tracing for energy conservation

Dirk Venter from eltherm South Africa, a heat-tracing specialist, highlights the energy savings and reliability advantages of using electrical heat tracing (EHT) solutions to maintain fluids at an optimum viscosity.

In a time where energy conservation has become paramount, the imminent winter months bring its own set of efficiency challenges. South African organisations face escalating energy usage and expenditure – during colder months – all in an effort to run operations within prescribed temperature perimeters.

Fortunately, technology innovation has led to some effective solutions that enable manufacturers to keep products at an optimal temperature, lowering viscosity and ensuring that it is easier to transport around the plant during the colder months.

One such solution is electrical heat tracing (EHT) which can assist plant and process managers to alleviate stubborn viscosity sensitive products and processes.

EHT lowers the viscosity of many processes as it acts as a compensating heat source to maintain or raise the heat in pipes, tanks, surfaces and other vessels. It effectively replaces the heat loss in the process and can therefore be used to prevent product from gelling or freezing, whilst maintaining the low viscosity of the process on plant equipment.

Ultimately, EHT helps ensure that pumps don't malfunction due to cavitation and pipes don't get blocked, mitigating costly repairs, maintenance and potential downtime.

Heat tracing can also provide significant cost reductions and energy conservation as it regulates temperature ensuring that during uncharacteristically cold days, other costly sources such as flange or gas heater don't have to be used to compensate for unplanned heat loss.

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Self-regulating EHT comes into play here as it provides a controlled wattage, effectively maintaining a fixed target temperature without external control. This in turn drives downtime spent to maintain temperature as well as continuously adjusting the temperature, or worse, be caught unawares as it becomes colder.

Self-regulating EHT therefore reduces power output as temperature increases and conversely increases it systematically as the temperature lowers, which in turn leads to improved energy efficiency.

Winter not only impacts industry, colder days and the resultant higher viscosity can also impact domestic water supply as well as reliable drainage of rain and waste water, leading to freeze damage and ultimately frozen and burst pipes.

To prevent freeze damage, EHT can be installed on vulnerable pipes, preventing them from freezing. Again, a customised, self-regulating heat tracing solution is developed, installed and monitored to ensure pipes are warm enough throughout the winter months.

EHT is typically used to maintain and lower the viscosity of industrial liquids such as:

- Resins, epoxies and adhesives.
- Petrochemical fractions.
- Bitumen.
- Food and beverage products such as glucose, chocolates, fats, vegetable and palm oils and other syrups.
- In automotive manufacturing processes for glues and oils.
- Maltose and dextrose used in the brewing industry.

Eltherm South Africa features a national footprint and includes a highly qualified and experienced team that offers a turnkey solution to EPC (engineering, procurement, construction) companies and specialist industries such as: constructions, automotive, power generation, oil and gas, petrochemical, mining, food and beverage and renewable energy with specific focus on CSP.

Globally, the eltherm group is regarded as one of the leading providers of electrical heat tracing systems. Notwithstanding the company's comprehensive manufacturing operations, it retains its core competency as an engineering design company operating from 11 locations across the world with a staff force of 265. ❑

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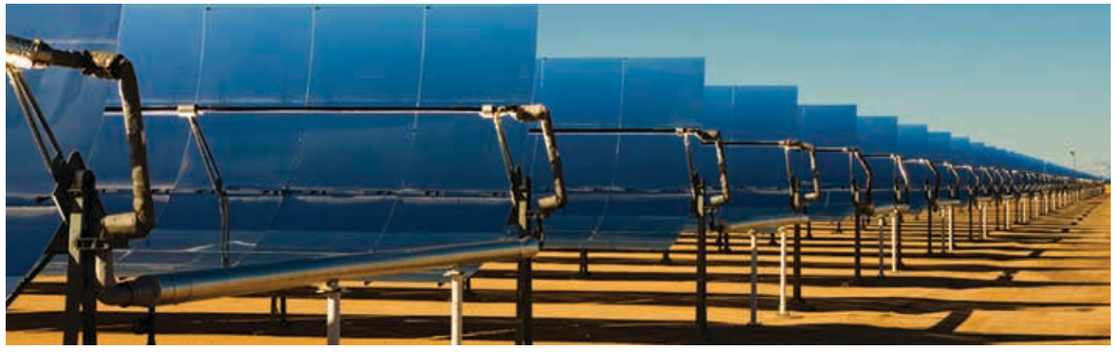

Eltherm is active in the renewable energy industry with specific focus on CSP, where heat tracing is required at CSP plants to maintain temperature and prevent subsequent heat loss.

Eltherm wins Ilanga solar contract

Global heat tracing specialist eltherm South Africa is responsible for the design and installation of the electrical heat tracing (EHT) system at the 100 MW Ilanga Solar Thermal Power Plant near Upington in the Northern Cape.

Ilanga marks the second big Concentrated Solar Power (CSP) project for eltherm this year: the installation of an EHT system is currently underway at the 100 MW Kathu Solar Park plant, also in the Northern Cape.

Like Kathu, eltherm will deliver EHT to Ilanga's Thermal Energy Storage (TES), heat transfer fluid (HTF) and balance of the plant (BOP). Eltherm was awarded the Ilanga contract by private engineering and technology company Sener and its engineering, procurement and construction (EPC) partners, Emvelo and Cobra.

Peter Stone, managing director at eltherm South Africa says: "Ilanga together with Kathu represent an important milestone in eltherm's local operations success and CSP growth in 2018. EHT plays an integral part in the successful running of CSP plants; we feel fortunate to contribute to the country's solar power growth."

The Ilanga EHT system

Heat tracing is required at CSP plants to maintain temperature and prevent subsequent heat loss. At Ilanga, eltherm will install the majority of the EHT at Ilanga's TES facility, which contains the plant's molten salt storage. Temperature classes of T1 to T3 – 450 to 200 °C – will be maintained.

Eltherm's EHT system, for example, pre-heats empty pipes and equipment to maintain the right temperature throughout the plant's storage process, which also avoids solidification of fluids. It also compensates for the loss of heat when fluids flow to pipes with a lower ambient temperature.

Ilanga's EHT system will be managed by eltherm's innovative TraceVision software and controllers, which will enable efficient and uninterrupted operations at the plant. The Ilanga EHT project will take approximately six to eight months to complete.

CSP and eltherm's success

Eltherm was also responsible for last year's successful installation of the EHT system at Xina Solar One in Pofadder in the Northern Cape and is currently involved with the maintenance and repairs of the heat tracing systems at Kaxu Solar One and Bokpoort CSP, also in the Northern Cape.

Globally, eltherm is one of the leading suppliers of heat tracing for solar power plants, which is essential for reliable operation. Installations include high profile projects such as the world's largest solar power plant NOOR III in Ouarzazate, Morocco, the Ashalim Power Station in Israel and the Waad al Shamal in Saudi Arabia.

The Noor III tower is 250 m high and stands in a large field of dual-axis tracking reflectors (heliostats) that concentrate sunlight on a central receiver at the top of a tower. The receiver contains a fluid deposit that is heated to between 500 and 1 000 °C. This fluid is then used as a heat source for a power generation or energy storage system.

At Noor III molten salt is used as a storage medium. Electrical heat tracing (EHT) is employed to prevent the solidification (at 260 °C) of these molten salts and to maintain an accurate process temperature throughout. ❑