

Infrared Heating prevents Gas Turbine Intake Filter Icing

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Gas turbines need air to work correctly. This air must be free of dust and other particles and therefore is always filtered.

Cold and damp intake air in the winter months can easily lead to the icing-up of the filters. These then only let through little air and the gas turbine must be throttled or switched off – just in the season in which it would be needed most.

Infrared systems of Heraeus Noblelight prevent successfully the freezing of air intake filters of gas power and gas compression stations in the cold season. An example of a gas compression station in Germany shows how an efficient and energy saving infrared module could be integrated into the combined filtration and sound insulation system.

Infrared heaters from Heraeus Noblelight are being used to prevent filtration systems from icing up within an acoustic protection system for a large scale (inline) Gas Compression Station in Germany.

The total acoustic protection package includes silencing of the gas turbine inlet and exhaust systems and has been designed, installed and project managed by Mechtool Engineering of Darlington on behalf of a major supplier of Gas fired turbines and compression systems.

It is important that the intake air to the turbines and compressors is filtered, as any particulate soiling can affect the plant performance by causing damage to the blading or even dust encrustations and fouling on the blades themselves. Non-woven materials tend to be used for filters and the Solar Turbines' system uses arrays of small filters within large filter housings. However, as gas turbines often operate in conditions of very low ambient temperature, it is important that intake air filtration systems incorporate some means to prevent icing up, as this could seriously affect filtration efficiency.

Various icing prevention techniques have been tried, including large hot water radiators using process heat and even taking compressed air from the system and blowing this directly at the filters. In this installation, it was decided to use infrared and tests showed that an infrared system uses less power and is easier to install than competitive techniques.

Consequently, three systems, each comprising 12 fast response medium wave, 5.6kW infrared modules was specified and installed for various filters. The modules are arranged in 3 banks of 4 emitters to give complete coverage over the filter surface. They are controlled by a thermostat, which switches on the heaters when the temperature falls below a set level and switches them off when the temperature rises to a pre-set level. The use of gold reflectors enhances the proven efficiency of infrared for this application and further improvements in efficiency are provided by the rapid response of the emitters.

Heraeus Noblelight GmbH with its headquarters in Hanau and with subsidiaries in the USA, Great Britain, France, China, Australia and Puerto Rico, is one of the technology- and market-leaders in the production of specialist light sources. In 2007, Heraeus Noblelight had an annual turnover of 90 Million € and employed 666 people worldwide. The organisation develops, manufactures and markets infrared and ultraviolet emitters for applications in industrial manufacture, environmental protection, medicine and cosmetics, research, development and analytical laboratories.

Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global, private company with over 155 years of tradition. Our businesses include precious metals, sensors, dental and medical products, quartz glass, and

specialty lighting sources. With product revenues of € 3 billion and precious metal trading revenues of € 9 billion, as well as over 11,000 employees in more than 100 companies worldwide, Heraeus holds a leading position in its global markets.

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