Infrared Heat Allows an Increase in Production Speed

Following the success of an earlier infrared installation, a second short wave infrared system from Heraeus Noblelight has allowed Mettis Aerospace to reduce the time required for the heating of smaller tools and dies used in the manufacture of high specification titanium aircraft components to one seventh of the heating times required by a previous gas system. The two systems provided significant energy savings and improved controllability, as well as improved forging practices.

Mettis Aerospace has decades of experience in the production of highly complex forged and machined, safety-critical aircraft components. Today, Mettis is an important global supplier of complex alloy components to industry giants such as Rolls Royce, Boeing and Airbus.

The manufacture of titanium components involves heating titanium preforms to above 900°C and then transferring the heated material into moulding tools. However, it is essential that the tools are preheated to above 200°C to allow better material flow and avoid die wear. Previously, die heating had been carried out by an open flame gas system, which directed its heat onto support plates. The gas system remained switched on for 24 hours to ensure that the plates were at the correct temperature before the tools were loaded into position. Heating by this method could take up to ten hours, with limited control of the heat transfer.

Today, an infrared-solution performs this process. The original short wave system installed, which was intended for heating large tools, consisted of two 72kW infrared cassettes, each mounted on an aluminium vertical profile frame. The new system is used for heating smaller tools and features three 50 kW short wave infrared cassettes. Similar to the larger system, the cassettes are located on two frames, positioned on either side of the table used to support the tools, which can be heated in pairs or singly, with heat applied from one side only or from both sides. During heating, a pair of thermocouples measures the temperature of each tool face and this measurement is then used to automatically regulate each cassette's emitters to maintain the set temperature with optimum energy consumption.

Since installation, the new system has allowed significant energy savings, as it is now only switched on when required, while tool heating times have been reduced, in some cases, from ten hours to just 90 minutes.

Features

- Infrared system preheats tools and dies to above 200°C
- Two systems, depending on the tool size
- Automatic regulation of each emitter

Technical Data

- Two 72 kW short wave infrared modules for larger tools
- Three 50 kW short wave infrared modules for smaller tools
- Controlled by a pair of thermocouples
- 90 minutes heating time

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