Heraeus Short Wave Infra-Red Speeds Up Tool Heating At Mettis Aerospace

Short wave infra-red emitters from Heraeus Noblelight have allowed Mettis Aerospace to reduce the time required for the heating of 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. This has provided significant energy savings and improved controllability, as well as improved forging practices at the company’s Redditch site.

Mettis Aerospace has decades of experience in the production of highly complex forged and machined, safety-critical aircraft components. This extends from manufacturing the majority of Britain’s aero engine pistons during WWII and pioneering the use of titanium in jet engines to developing alloys for use in Concorde’s structure and skin. 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 at the company’s Redditch factory 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 pre-heated 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.

When modernization work was carried out in the Redditch facility, particular attention was paid to the tool-heating system and Heraeus was asked to provide an alternative infra-red solution. The short wave system installed consists of two 72kW infrared cassettes, each mounted on an aluminium vertical profile frame. The two frames are 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 constantly from 0-100% to maintain the set temperature with optimum energy consumption, maximising the system’s efficiency.

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.

As Dr. Xenofon Gogouvitis, the R&D lead at Mettis, reports, “Implementation of an IR heating solution has been a very important step towards an eco-friendly factory. The system’s efficiency has allowed us to reduce energy and time consumption during the pre-heating stage of the dies, while improving overall control of the process. In addition, the absence of any open flames means that we now have a safer and more comfortable working environment.”

Heraeus specialises in the production and application of high quality energy sources covering the electro-magnetic spectrum from ultraviolet to infra-red. It has over 40 years experience in infra-red technology and offers the expertise, products and systems to provide efficient and effective solutions to drying, heating and curing problems throughout industry.