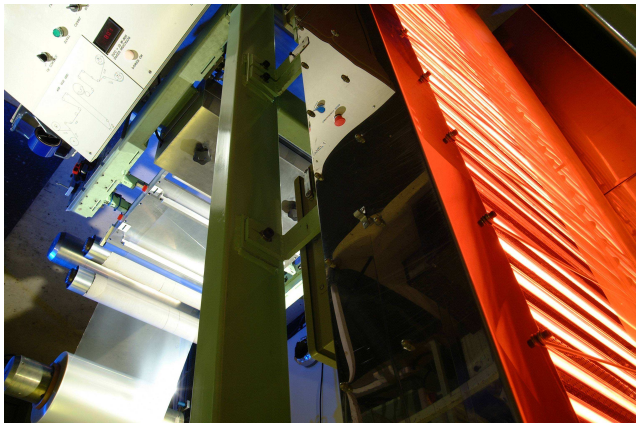
Infrared for keyboard manufacture

Infrared heating systems from Heraeus Noblelight are helping Cherry Electrical Products Ltd to ensure the excellent quality of their high performance computer keyboards, while at the same time reducing manufacturing costs.
At its Harpenden factory, Cherry manufactures a number of high specification computer keyboards, incorporating its Full Travel Sealed Contact (FTSC) technology. This relies on a key module effecting a contact between two PET membranes, which are screen printed with the necessary electronic circuitry.
The screen printing of the two membranes is an essential part of the keyboard manufacturing process. It is also important that the screen printing is heat-cured in a convection oven after application, when it is vital that there is no shrinkage of the PET membrane, as this would adversely affect the circuitry.
Previously, Cherry had bought in special PET material which had been treated to prevent shrinkage. But this was expensive therefore and also for quality reasons, Cherry decided to investigate alternative techniques of achieving pre-shrunk PET material. Plastics can be quickly heated by irradiation with infrared emitters, as they absorb medium wave radiation particularly well and convert it efficiently into heat.
Following trials, it was determined that the optimum solution to the pre-shrinking task would be offered by carbon infrared technology, as it offers medium wave radiation at high power density with rapid response times. The compactness of carbon infrared was also an important consideration, as it was necessary that any system installed on the production line should have a small footprint, because of the limited space available.
As a result, a carbon medium wave system was supplied to Cherry and this was fitted before the screen printing station. In operation, the 430mm web of PET passes under a carbon infrared cassette, containing 34, 2.2kW emitters, giving a total power rating of 74.8kW. The web passes under the emitters at a line speed of 18m/min and it is uniformly heated to a temperature of 160°C, to achieve a shrinkage in t he web of 3% in both the transverse direction and the machine (forward travel) direction. The temperature of the web is controlled by means of an optical pyrometer, which acts to regulate the emitter power, while power is also controlled in line with the web speed by means of a tachometer.



Features

- pre-shrinking of PET
- increased quality
- reducing manufacturing costs

Technical Data

- carbon medium wave infrared system
- 74,8kW total power rating
- 18 m/min
- PET web heated up to 160°C

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