Infrared heat helps thermoforming bioplastics

Bioplastics are environmentally-friendly, not least because they are produced from renewable raw materials and are not petroleum-based. In addition, they are degradable and can be composted. Plantic Technologies Ltd has developed and patented a bioplastic made of vegetable starch from non-genetically engineered maize.
This corn starch is used to manufacture trays, blisters and sorting inserts in chocolate packaging. To do this, the foil must be heated and then thermoformed. Usually, using conventional plastic foils, this takes place in several stages, each involving a few seconds heating, until the deformation temperature is achieved. However, properties such as strength, flexibility and stability of the corn starch foil can be detrimentally affected by long heat-up times. This is because water can leach from the foil in the heating process and this can lead to embrittlement.
In collaboration with Heraeus, Plantic investigated several possibilities in an effort to optimise the heating process. Short wave emitters demonstrated that they were particularly suitable for the task, as using high power, they could bring the foil to the deformation temperature of around 140ºC in approximately two seconds. This is so fast that there is virtually no water loss. A heating module with overlapping emitter ends and several heating zones ensures a homogenous temperature distribution across the foil. Consequently, the forming process for corn starch foils is optimised and it has also been shown that reject rates at process start-up can be minimised.

Features

- Heating of plastic foils from corn starch prior to forming
- 140 °C in about 2 seconds

Technical Data

- short wave infrared heaters
- 1 module with overlapping emitter ends
- several heating zones, individually controlled
- control via touch screen

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