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## Infrared heaters help put the ‘thermo’ into thermoforming

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A better understanding of what works, and what doesn't, when using infrared heaters could prove profitable for thermoformers, and even more so for processors of high-volume packaging applications. According to heating element supplier Ceramicx, simply reviewing and renewing the infrared heating platen can lead to a 30-40% improvement in operational efficiency of most packaging thermoforming lines.

Those numbers come from Frank Wilson, founder and managing director of Ceramicx (Ballydehob, Ireland), who reminds processors that these oft-forgotten assets in a processing machine also require maintenance and analysis. Otherwise, output and quality will suffer. As a general rule, he notes, heat systems are very rarely the cause of production problems. Instead, the complexity of the part's design, its dimensions, the depth of the thermoforming "draw", and the characteristics of the material composition are the prime culprits when it comes to naming a problem.

The essence of infrared heating involves three factors: absorption, transmission, and radiation. During thermoforming, infrared ceramic heaters are generally mounted on reflectors which are then arrayed upon a platen—or two—which is part of a production line.

The performance of the background reflectors—their material composition—and the performance of the platens are vital in directing the infrared heating to the plastic sheet being processed. Stainless steel is not an adequate material for use in infrared reflection as it will absorb a high percentage of the emitted energy. Over time this will cause burnout of the electrical wiring behind the reflector and will also start to cause discoloration. Polished aluminum is in most cases the best reflector for ceramic infrared heating but at temperatures above 500°C it also will start to fail—but then, such high temperatures will rarely be seen in a thermoforming line.

Over time, he notes, as a platen system starts to discolor and degrade in operation due to dirt and other materials, the system's reflectivity will be compromised. That is when the machine operator will typically try to increase the temperature in order to achieve the same performance. Regular review and maintenance could pre-empt this lack of control and the extra cost for the higher energy bill.

Ceramicx suggests a 30-40% improvement in operational efficiency is possible on most packaging thermoforming systems simply by reviewing and occasionally renewing the infrared heating platen. The ideal control is to mount a thermocouple on the existing reflector system to keep an eye on the temperature. When this starts to rise - taking more and more energy - the user should be alerted to take action. The savings could be considerable. —mpweditorial@cancom.com