

Guest Blog: Notes on heating/cost issues for thermoformers

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The best thermoformers in the world are now questioning and re-evaluating their heat technology and production efficiency. Carrying on regardless with the same heat legacy issues is neither sensible nor profitable. A time for review inevitably means taking a fresh look at Infrared (IR) heat technology.' www.ceramicx.com

Ceramicx exports its infrared heating systems to thermoformers and blow moulders in over 60 countries worldwide.

'Despite the advances in fracking and shale gas, US manufacturing industry is still being incentivized to go green. For many thermoformers this means an adoption of IR-based heating + sophisticated control as a way of increasing accuracy and saving cost,' says Wilson, currently making preparations with distributor Weco International to exhibit at NPE 2015. 'The key is firstly great IR thermoforming platen build, then combined with pin-point accurate electronic and process control.'

'The primary benefit,' says Wilson, 'is that the customer is offered improved efficiency through decreased energy usage, increased production, reduced scrap and downtime.'

Getting new IR heating systems designed and installed for thermoformers typically requires 3-4 days onsite for integration, including a 24 hour runoff. Ceramicx believes that any thermoforming control system should provide early warning diagnostic features; the ability to alarm the operator in the event of a single heater loss, a shorted wire or bad fuse.

Ceramicx experience is that most plastics thermoformers experience heating issues at some point in the life of their machine. 'The heating issues of the past ten years for thermoformers worldwide are broadly the same,' says Wilson, 'and until we see a wholesale adoption of IR based heating – the core messages to all thermoformers will be the same.'

Those messages include the assertion that a simple infrared (IR) heating upgrade to a company's conventional heating system can increase profits for thermoformers by at least one third, according Ceramicx.

Replacing an entire thermoforming machine is too big a step for many but an IR upgrade can improve the performance of an expensive fixed capital asset and typically pays for itself within months.

Heating legacy issues can include burn outs, electrical faults and with problems with older style and non-directional heating. Tubular and magnesium filled heating solutions; black rod heating and other kinds of non-infrared sources can all make a contribution to inexact systems of thermoforming production and – above all – to a waste of energy and electricity cost.

In a completely enclosed system or oven, this kind of heating becomes uncontrollable. Thermoforming operators are being continually forced to ramp up the power and the input electricity in order to try and maintain an even temperature.

Effective plastics thermoforming means that all energy inputs have to be properly measured and then specifically applied.

According to Ceramicx, IR heating for thermoformers includes the following benefits:

Major reduction in capital equipment wear and tear

Like-for-like infrared for tubular replacements

Elimination of 'hot box' tubular problems

No need for changes in control or instrumentation

Poor performing infra red to be replaced with superior platens

Savings in directional heat

Better resultant product quality/Improved set up time and tool change time

More complex parts possible

Cooling requirements also reduced

Matching of heating controls to polymers being processed

Improved environment for operators

Ceramicx-designed thermoforming systems essentially convert incoming electrical wattage into infrared output more quickly and efficiently.

The core of the Ceramicx quality assurance (QA) work centres on developing systems of closely specified nominal wattage tolerances for the ceramic and quartz electrical elements. This control applies throughout the entire range of Ceramicx products. The semi automated validation system with closed-loop process-control guarantees the product quality. It also assigns and records performance characteristics for each part as it is produced.

In thermoforming production a number of infrared ceramic heaters are generally mounted on reflectors which are then arrayed upon a platen – or two – which is part of the production line.

The performance of the background reflectors - their material composition - and the performance of the platen in general – these factors are all vital in directing the infrared heating to the plastic.

For example, Ceramicx points out that stainless steel is not an adequate material for use in infrared reflection work. It will absorb a high percentage of the emitted energy and will therefore over time cause burnout of the electrical wiring behind the reflector and will also start to discolor from 120degC. Polished aluminum on the other hand is in most cases the best reflector for ceramic infrared heating but > 500 C it also will start to fail. The business of thermoforming thin and clear plastic sheet needs some installation of passive ceramic tiles in the base of the platen in order to reflect back the heat.

Every thermoforming system, in some way, has its custom features depending on products, materials and cycle time. The Ceramicx belief is that sooner or later most of these will migrate over to IR based systems in the coming years.

Frank Wilson, Ceramicx Founder and Managing Director.



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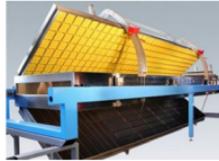
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