

HeatWorks

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**Ceramicx to
show benefits to
thermoformers
at K 2016**

INDUSTRY 4.0

**SURFING THE WAVE OF
THE NEXT INDUSTRIAL
REVOLUTION.**

HEATING A MOVING TARGET

**CONVEYING, HEATING AND
PROCESS CONTROL**



SIEMENS
FINANCIAL SERVICES

Paris | France | March 14-17
JEC 2017

THINK
BEFORE YOU FORM !

Growth and Opportunity

2016 has been a year of continued growth and renewed opportunity at Ceramicx.

These pages will show you something of the manufacturing blueprint that is to come for our company over the next five years; strategy and thinking that has been closely developed with our friends at Cambridge University's Institute for Manufacturing.

Our new building work has already begun and the cusp of a new era at Ceramicx is already upon us.

We therefore travel in very good heart to the upcoming triennial plastics exhibition – K 2016. This is our 5th time of exhibiting at this important show. As ever we will be joined by our German distributors Friedr Freek and, on this occasion by our engineering associates at Trinity College Dublin (TCD) who are helping equip Ceramicx in matters of automation and in the new manufacturing horizon of Industry 4.0.

This issue of our magazine lifts the lid on all of these developments and more. Although it is frequently misunderstood and sometimes ill informed the world of Infrared heating does not stand still, and we must move with it.

As ever - please do not hesitate to involve Ceramicx in your heating needs and enquiries.

We look forward to hearing about your IR heating needs and issues.



Frank Wilson
Managing Director, Ceramicx Ltd.

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Services. Ceramicx is pleased to announce that is now an approved vendor of Siemens Financial Services

HeatWorks

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Ceramicx to show benefits to thermoformers

at K 2016 Ceramicx is all set to exhibit and demonstrate a broad range of IR (infrared) heating products and engineering solutions for the world-wide plastics industries at K 2016 in Düsseldorf.

The triennial international show continues to lead the pack and can legitimately claim to be the best in the world. The entire exhibition grounds – more than 170,000 square meters, are fully booked.

All the signs are that the plastics industry will continue an upward trajectory and that K 2016 business will easily exceed that of 2013; just as that year was significantly improved upon 2010.

Key users in plastics of Ceramicx technology – and likely K 2016 visitors – will include thermoforming and blow moulding processors and machinery builders, together with those involved in drying, curing, materials welding and bonding, conveying and furnace ovens.

This will be the 5th time of exhibiting for Ceramicx at the K show. The K2013 exhibition saw the launch of the company's world-first Herschel IR test instrument – technology that is able to map and predict the invisible spectrum of the Infrared energy field. K 2016 will see Ceramicx launch further

IR heating machines – as well as display all of the company's standard heating hardware range.



Ceramicx output is 98% exported and the company's current €2m + expansion will see the creation of higher value jobs supported by increased levels of automation and know-how at the main factory works.

Over the past five years Ceramicx has invested in a large machinery shop, with CNC milling machines and metal cutting, spark and wire erosion, shaping and finishing machinery and dust presses in order to ensure the continuing & independent manufacturing success of the company – with no dependence minimal outsourcing and full control of the innovation and materials used.

Part of the unique Ceramicx service is to mix and match all kinds of process control and Infrared heating options in the best interests of the plastics industry customer. Founder Frank Wilson says that 'at Ceramicx you will find a company that is not satisfied with the established standards for the industry. We have developed many new products that better fit the needs of today's manufacturer who has no choice but to be reliant on process heating.

We set out to give our plastics industry customers a much superior product at a competitive price and we look forward to offering all a very warm welcome at our K 2016 booth.'

Ceramicx is unique in making and supplying all three kinds of IR

components – ceramic elements, quartz elements and quartz tungsten elements. All of these elements offer an immense range of heating types and heating performance, giving wide options to the plastics processor: Ceramicx makes Ceramic and Quartz emitters which range in surface temperature from 150°C (302°F) to 730°C (1346°F) and the Ceramicx Tungsten bulbs are capable of reaching in excess of 2400°C (4352°F).

“ The best thermoformers in the world are likely to be in Düsseldorf ”

This year's K exhibition will provide Ceramicx with an excellent platform to market to leading plastics processors – primarily those in plastics thermoforming industries (both inline and cut sheet), and also to thermoforming machinery builders, many of whom will also be showing their latest wares at the show.

'The best thermoformers in the world are likely to be in Düsseldorf in late October,' notes Frank Wilson. 'These companies make sure to question and re-evaluate 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.'



2016 Finalist



ORDER NO.	PRODUCT	RUNNING	OVER STATUS	USER NAME	PLC DATE
236-242	T1				23/10/2013 15:14
236-242	T2				23/10/2013 15:14
236-242	T3				23/10/2013 15:14
236-242	B1				23/10/2013 15:14
236-242	B2				23/10/2013 15:14
236-242	B3				23/10/2013 15:14

For many thermoformers this means an adoption of IR-based heating and sophisticated control as a way of increasing accuracy and saving cost.

‘The first building block,’ says Wilson ‘is great IR thermoforming platen design and build. The second building block is to combine that with pin-point accurate electronic and process control.

The primary outcome and benefit is that the customer is offered improved efficiency through decreased energy usage. This in turn enables increased production, reduced scrap and reduce downtime.’

Getting new IR heating systems designed and installed for thermoformers is fast becoming a key element of the solutions engineering work at Ceramicx. The process typically requires 3-4 days onsite for integration, including a 24 hour runoff period. These schedules typically apply at any site in the world.

Ceramicx believes that any thermoforming control system should also 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 will experience heating issues at some point in the life of their thermoforming machine.

‘For any thermoforming visitor to our K booth this year I can guarantee that the heating issues over the past ten years 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, and perhaps more consistently at 40% saving.

Ceramicx infrared heating system provided a 40% energy saving for a thermoforming customer’s infrared heating system when compared to a conventional heating system on an identical thermoforming machine.



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.

Conventional 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,’ says Wilson. ‘As the system gradually weakens and loses power thermoforming operators are being continually forced to ramp up the power and the input electricity in order to try and maintain an even temperature. Such operating behaviour leads to further failures and expense.

Ceramicx believes that IR-based heating solutions for thermoformers includes the following benefits:

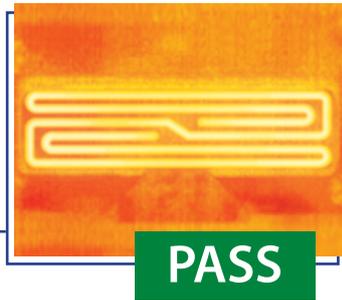
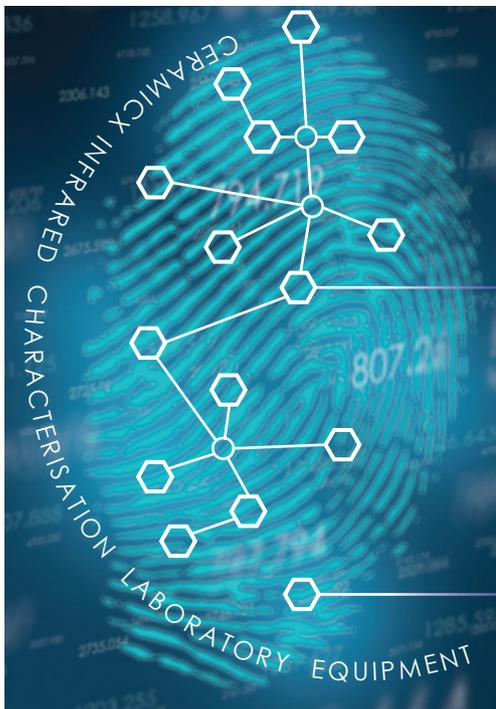
- Major reduction in capital equipment wear and tear
- Like-for-like infrared for tubular replacements
- Elimination of ‘hot box’ tubular problems
- No need for changes in control or instrumentation
- Poor performing infra red to be replaced with superior platens
- Savings in directional heat
- Better 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 IR-based thermoforming systems essentially convert incoming electrical wattage into infrared output more quickly and efficiently.

In order to fully validate such retrofit systems Ceramicx-produced IR components are made to the highest quality assured (QA) systems. Each ceramic component within the platen array, for example, has its own unique ‘thumbprint’ for example – the exact specifications for which are all available to the purchaser/user.

All components feature closely specified nominal wattage tolerances for the ceramic and quartz electrical elements. This control applies throughout the entire range of





RANDOM SUB SAMPLE
 Additional lab mode long term testing to validate existing product performance and characterise new product design prototypes.



Think before you form!

Help for thermoformers at K 2016

As well as a mandatory visit to the Ceramicx stand at K2016, visiting

thermoformers can get up to date with the latest simulation programs available. **Plastics industry practitioner and HeatWorks correspondent, David Russell reports.**

Dr Karel Kouba, founder and director of Accuform, world leaders in simulation for Blow Moulding and Thermoforming will once again be exhibiting at the K exhibition - Hall 3 Stand D69-01.

The software packages **T-Sim** (www.t-sim.com) and **B-Sim** (www.b-sim.com) software have both been developed by Accuform at the request of the thermoforming and blow moulding industries since 1995.

There are currently 300 licensees worldwide – predominantly moulders, but others include many multinational material suppliers and OEMs.

Both packages deploy unique software that uses the measured stretching

Ceramicx products. A semi automated validation system with closed-loop process-control guarantees the product quality. It also assigns and records performance characteristics ('thumbprints') for each part as it is produced. The performance of the background reflectors in thermoforming production - 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 discolour from 120°C. Polished aluminium 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.

'A discussion with Ceramicx at the K show will show thermoforming processors and thermoforming machine builders that – where IR emission is concerned - there are 'horses for courses,' says Wilson, and that 'every thermoforming system, in some way, has its custom features depending on products, materials and cycle time. We look forward to seeing you at the show!'

All further details Ceramicx
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characteristics of the material at processing temperatures in order to accurately predict the finished dimensions of the moulded parts; wall thickness's, corners

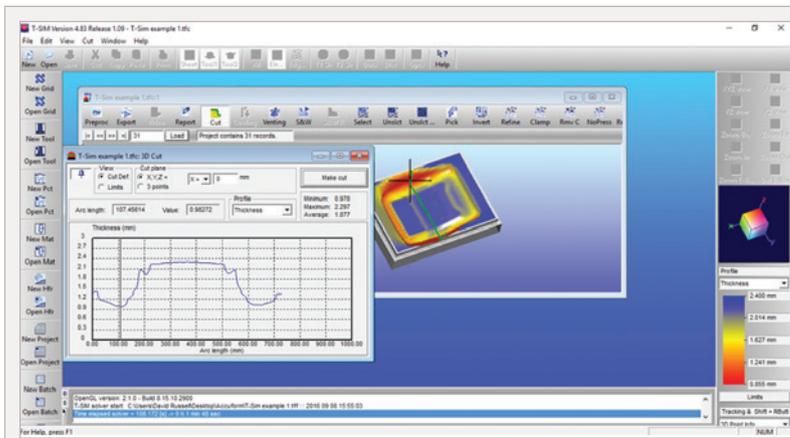
The benefits of T-Sim and B-Sim lie chiefly in their time and cost saving predictive powers; revealing problem areas before any tool is cut and also – further down the line - eliminating costly tool modifications and part changes; a possible source of friction and embarrassment between moulder and client.

The Accuform software does not replace expertise – it complements it and is typically used to review long-standing and perhaps ineffective machine settings – without building any tools or wasting any materials or machine time.

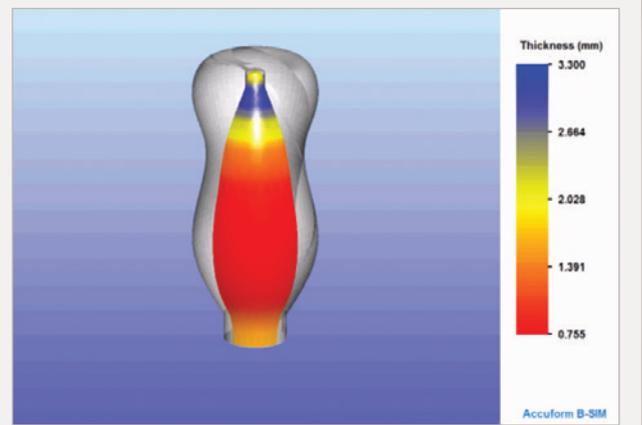
One packaging thermoforming client used simulation to look at varying temperatures +/- 15°C (sheet, tool, plug) and using different plug penetration depths. The result was a 10% cost removal - for no capital outlay and no loss of quality.

Here in the UK, and since Brexit we are being repeatedly told by Government and the media that we need to be more productive and innovative to be competitive. The days of the 'we've always done it like that' must be consigned to history.

And so what better way of looking at productivity and innovation than using modern computing power to review long-establish moulding methods. The reason? Principally to optimise new jobs and to take cost out of existing



Screen shot of T-Sim wall thickness



The B-Sim blow moulding programme in action

K2016 will see Dr Kouba demonstrating the new 3D version of both software packages, showing numerous optimisation features to visiting designers and engineers who would like to use modern computing power to improve their technical capabilities – and eliminate start-up problems/costs. Simulation of this kind sits between design and manufacturing and provides benefits for both functions. It is regularly used as the vehicle to get these functions working towards optimisation of design, cost and performance – and take cost out of existing products.

The 16 variants that the T-Sim programme examined would have - in real terms - taken up an inordinate amount of shop floor time and materials. However, the task was achieved with simulation; on a laptop in the office, and in one afternoon.

After undertaking the appropriate training, users can then enjoy their first simulations within some 15mins and instantaneously see moulded thickness's and identify problem areas. Alternative settings can then be explored in order to optimise design and cost and can give manufacturers a comfort zone for truly effective manufacture of the product.

jobs – and, along the way, to provide good data for Finite Element Analysis (FEA).

Simulation and FEA technology have been well established for some time in the Injection Moulding process. It is surely only a matter of time before the same innovative technology takes root in for Thermoforming and Blow Moulding.

Check out Accuform during your K 2016 visit. Alternatively, contact David Russell who is happy to run trial simulations.

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Heating a moving target

Much of the applications engineering work that Ceramicx does for its customers involves incorporating the necessary heatwork into an existing factory system – or production line.

Typically, the job involves being at the client for a period of two or three days to install and commission heating and engineering that has been agreed and tested offline.

Retrofitting an oven or heat platen into a thermoforming production line, for example, is a good example of such work.

Ceramicx is now enabled to build and supply complete heating lines from scratch – complete with conveying, heating and process control systems.

Typically these are new systems that have been commissioned to replace old production. The customer benefits in at least three ways: Firstly, existing production – of the old methods - does not have to be stopped.

Secondly, the new production system is designed, built, tested and validated off-site at Ceramicx and is ready for action once installed.

Thirdly, the new IR based system makes an immediate impact on utility cost, as well as providing cleaner and greener energy.

Ceramicx Engineer Tadhg Whooley says that 'once customers realize the triple benefit of commissioning an IR heat conveying system our technical discussions quickly follow on.'

Sometimes the IR conveying system can effect a very dramatic reduction in time, cost and inventory:

One of the first customers for the Ceramicx conveying oven – a 1st tire automotive supply company – is currently letting its products dry unassisted for 3.5 hrs at a time. The new conveying line will reduce that downtime to mere seconds – increasing throughput and optimizing the use of factory space.

Ceramicx conveyor ovens systems typically involve the supply of all hardware, including conveyors in various materials and dimensions; IR heat sources of various kinds (including pre-heating) and a process control cabinet which controls all automatic movements, provides alarms via various sensors and also allows for manual movements where required.

Power loads can vary and oven sizes and dimensions are made bespoke for each customer as is the mode of IR heating, long, medium or short wave.

Ovens are normally supplied in polished stainless steel grade 304 and typically divided into a number of closed loop control zones. Heat reflectors are supplied in aluminised steel; all zones are controlled by feedback from type K thermocouples.

Delivery of the system is typically 8-12 weeks after receipt of the order/design approval.



Surfing the wave of the next industrial revolution

HeatWorks magazine talks to Dr Garret O'Donnell of Trinity College Dublin on the background of the work that TCD is currently doing for Ceramicx.

Welcome again to HeatWorks magazine Garret! Could you first give us a little background on this concept of Industry 4.0 that we're hearing so much of these days?

Thank you. Historically, the initiative of Industry 4.0 put forward by the German Acatech body helped to contextualise where technology is currently and relate it to production, positioning us in the 4th industrial revolution.

So what is this 4th industrial revolution about?

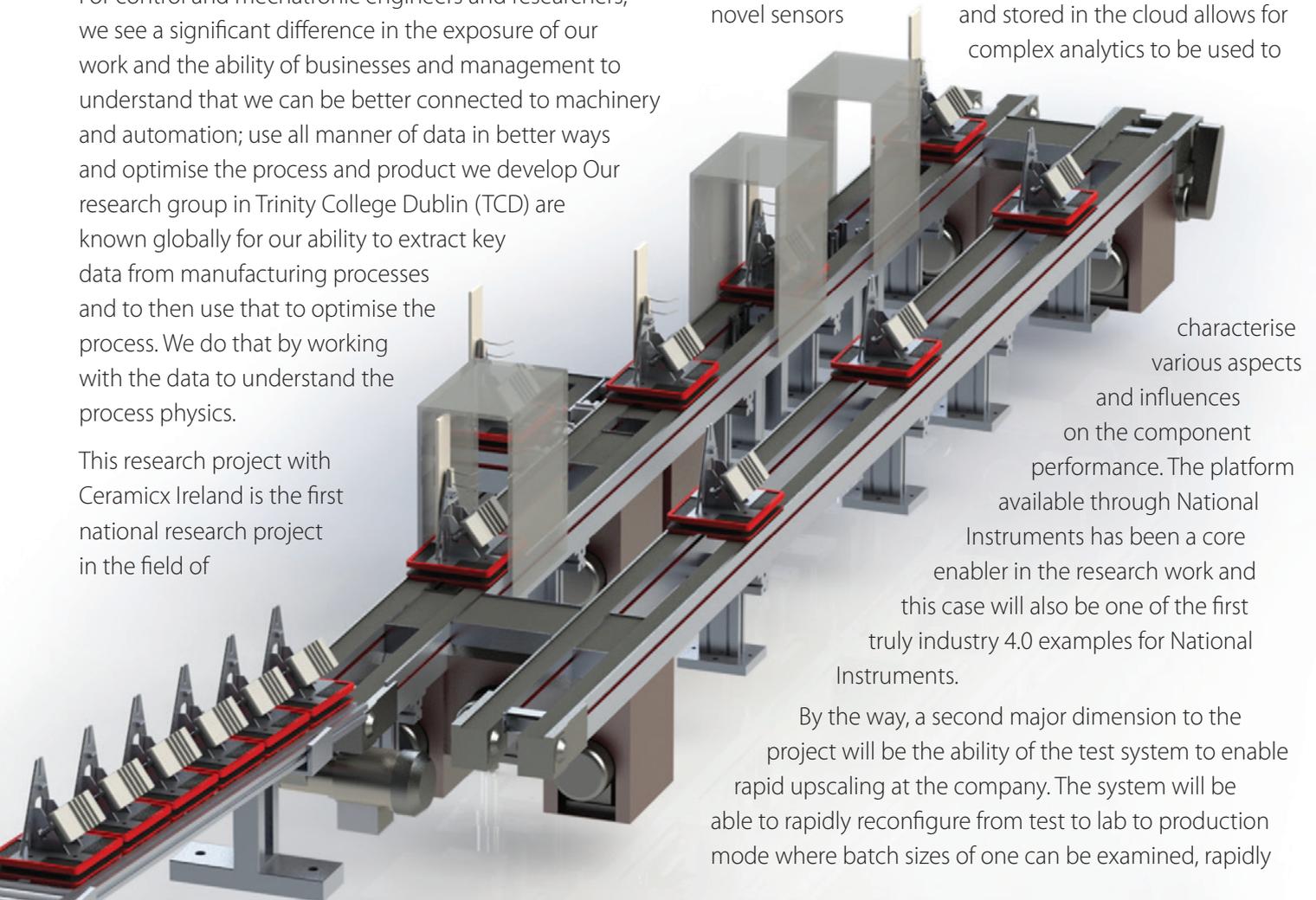
For control and mechatronic engineers and researchers, we see a significant difference in the exposure of our work and the ability of businesses and management to understand that we can be better connected to machinery and automation; use all manner of data in better ways and optimise the process and product we develop. Our research group in Trinity College Dublin (TCD) are known globally for our ability to extract key data from manufacturing processes and to then use that to optimise the process. We do that by working with the data to understand the process physics.

This research project with Ceramicx Ireland is the first national research project in the field of

industrial IOT to be funded in Ireland and by Q1 2017 will be fully implemented within the Ceramicx manufacturing facility in Cork.

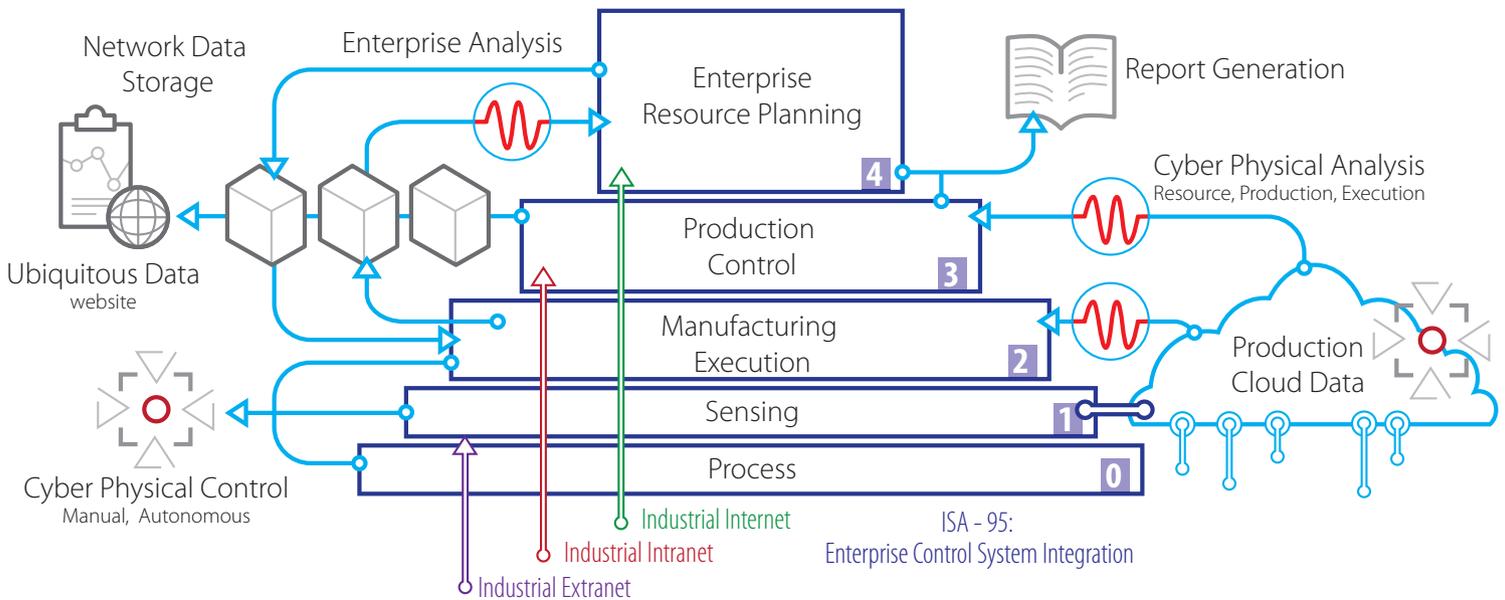
And how will the work change things at Ceramicx?

The impact of this Industry 4.0 project on Ceramicx will be transformational in that it will bring extensive data into one cloud location. The location will cover all of the product features, and all of the product performance gathered during manufacturing. Having this data gathered from novel sensors and stored in the cloud allows for complex analytics to be used to



characterise various aspects and influences on the component performance. The platform available through National Instruments has been a core enabler in the research work and this case will also be one of the first truly industry 4.0 examples for National Instruments.

By the way, a second major dimension to the project will be the ability of the test system to enable rapid upscaling at the company. The system will be able to rapidly reconfigure from test to lab to production mode where batch sizes of one can be examined, rapidly



accelerating the new product development cycle in Ceramicx.

How has the outsourcing approach helped?

By engaging with the Manufacturing Engineering Research group in Trinity College Dublin, Ceramicx has found a partner that can realise the company’s vision to have this rich data made accessible for purposes of optimisation and for generation of novel IP and new IR heating solutions.

This is the second project of this nature developed in partnership between Ceramicx and Trinity College Dublin – the first was the creation of the Herschel Machine Test Instrument - and this has also helped Ceramicx to build its competence in developing test systems for their own customers.

What about the machines involved?

The machine is christened CIRCLE and a modular reconfigurable design philosophy has been used. Therefore the machine can scale to have additional test stations included, and can also adapt to cover 95% of the product portfolio of Ceramicx.

Through the development of a novel software architecture using NI platform, the data will be collated and stored on a cloud platform and open for analytics.

Schematics of the data model are used, based on the ISA 95 enterprise control system. In this case the data available is a rich stream of performance and characterisation data.

This contrasts with much typical manufacturing data which normally includes only elementary product status or elementary supply chain data.

What are the next steps?

Work and research is on-going in Trinity College Dublin, finalising the system. The full solution will be put in place in Ceramicx in Cork in Q1 2017.

The platform developed is also being evaluated as a potential platform for bespoke test systems for other applications for Ceramicx customers.

Thank you for your time Garret!

You’re welcome

Dr Garret O’Donnell and colleagues from Trinity College Dublin will join Ceramicx at the K 2016 exhibition in Düsseldorf, October 19-26. Please contact Ceramicx directly should you be visiting the show and wish to make an appointment.



Dr. Garret O'Donnell



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The Ceramicx Vector to show at JEC 2017

Ceramicx will launch the newly created Vector drape forming machine at the JEC World exhibition in Paris next March 2017. Dr Peter Marshall of Ceramicx explains how the new composites heating technology is set to reach an international marketplace that is ripe for change.

The Ceramicx Vector drape forming machine is designed to heat and cure carbon composite material whether its pre-preg or dry fibre. Ceramicx is applying its deep knowledge of infrared heating to carbon fibre, optimising the balance between temperature, penetration, power and cycle time.

The Vector can be customised to meet the customer's size requirements with no exclusive minimum or maximum dimensions for parts. The heaters are individually powered and controlled in zones by the ubiquitous Siemens HCS system in conjunction with calibrated optical temperature measurement. The feedback loop ensures that the part does not exceed the upper most cure temperature and that the temperature gradient through the part's thickness is as minimal as possible.

The Vector drape forming machine has no complex drive shaft systems, gear boxes or external motors. This reduces the vibrations in to the heaters and the required maintenance on these parts. Moreover, floor space can be reduced as access is virtually all from beneath the superstructure.

The optimisation of the heating parameters will save the user time and money ensuring that infrared radiation's properties and capabilities are exploited to best suit their materials, application and process. Additionally, multiple trolleys and vacuum systems can be supplied to further ensure that process time is as minimal as possible giving the company greater economies to the user.

Future developments for the machine include optimisation of the pyrometers to incorporate live changes in emissivity of the over materials as well as calibration of the time required for the heat to traverse the thickness of the part.

These will couple together to give the user a much greater understanding of their heating process and the complex heat transfer phenomena which are occurring during the process.

Investigations will also be made into the use of novel methods to characterise, reduce and/or eliminate the void content within the part. Research into this aspect will commence shortly.



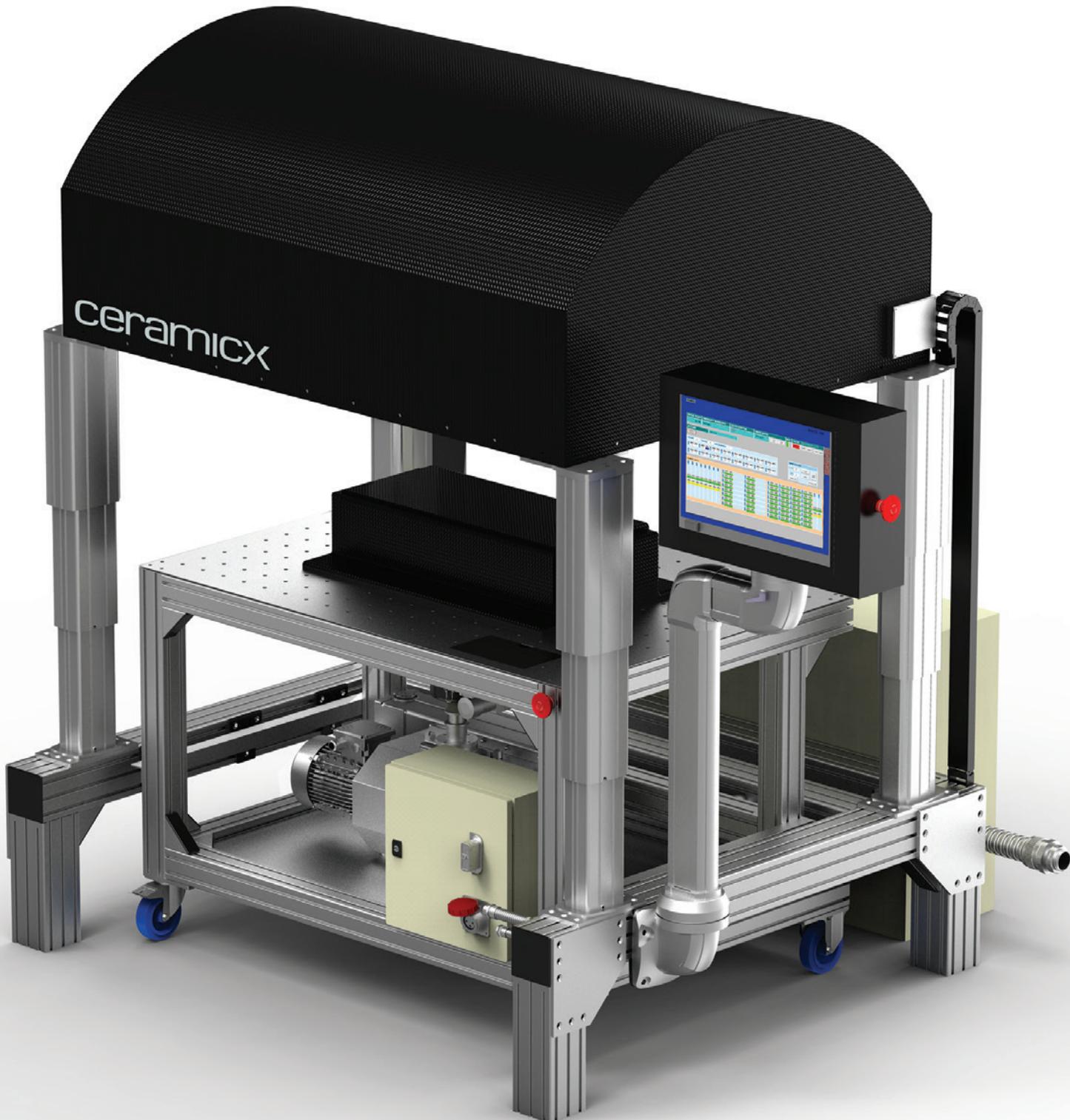
The development of the Vector Drape former has been completed in conjunction with Findhan Strain, Belfast Metropolitan College. The college's vast experience of troubleshooting composite forming and process development is unrivalled. The project has also been generously supported by InterTradeIreland's Fusion project. As testing and troubleshooting continues, Ceramicx will publish data, in the form of white papers, on the heating process for these carbon composite materials.

To discuss your process and machine requirements please contact Ceramicx/WECO

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Hot from the shop floor!

World class manufactured IR components and heating products are the lifeblood of the Ceramicx business. HeatWorks magazine talks to Ceramicx Production Manager, Patrick Wilson, about some recent innovations coming through....



Patrick Wilson

The core business of Ceramicx is the design and manufacture of infrared heating components and systems for industrial and commercial use. Ceramicx is unique in the supply world in that it make and supplies all three kinds of IR components – ceramic elements, quartz elements and quartz tungsten elements

All of these elements offer an immense range of heating types and heating performance: Ceramicx makes ceramic and quartz emitters which range in

surface temperature from 150°C (302°F) to 730°C (1346°F) and the Ceramicx Tungsten bulbs are capable of reaching in excess of 2400°C (4352°F).

Quartz elements for example, have seen significant technical investment this year. 'This has been a big area for us,' notes Patrick. 'We have created many different and bespoke sizes and over the past year or so we have also been asked to

manufacture many custom ranges; small, long, wide, curved products.

The reason? 'A lot of our customers are looking to get a faster response from their heating processes; including an ability to exert much more control over cycle time and the heat process generally.'

So why do they come to Ceramicx? Patrick says that 'our ability to be able to go from design to dispatch is really fast. One of the reasons for that is that we build everything ourselves in-house and thus have much more control over the factors within the lead time. Ceramicx has deliberately built that in house flexibility for just that reason and to be able to respond to our customers' demands.

New on the scene is a Furnace Infrared Heater from Ceramicx. 'This is a new product that we have been developing,' says Patrick. 'We call it the furnace infrared heater, because it is all about the power and heats up in no time.'

Some new clients are looking for increased power all the time, and we have found that our ceramic and quartz element materials can only handle so much. This new product has the ability to handle the power and the heat, therefore providing an alternative solution to our customers.

So – excusing the pun - what are the really hot products in Ceramicx at this time? 'We always have two or three new products in development at any one time,' says Patrick. 'However, our classic FTE, SFEH, FQE products that have been around for some years continue to be the "go-to" products for our customers. They perform exceedingly well in very many applications and so many of our customers don't feel any need to change that.'

Technical and scientific development is the Ceramicx bedrock. Flexibility of approach with regard to the world's marketplaces is also key to winning business and is a feature of the Ceramicx approach. The Chinaplas 2016 exhibition

five months ago, for example, saw Patrick Wilson in Shanghai with a new range of heaters, expressly made for that market. Patrick says that 'we wanted to demonstrate our cutting edge expertise in infrared heat technology for the thermoforming equipment builders in that market. Machinery builders in China had shown a particular appetite for our Square Flat Hollow IR heating (SFEH) element and so we recognised that demand and created a new ceramic heating element for that part of the plastics industry there.'

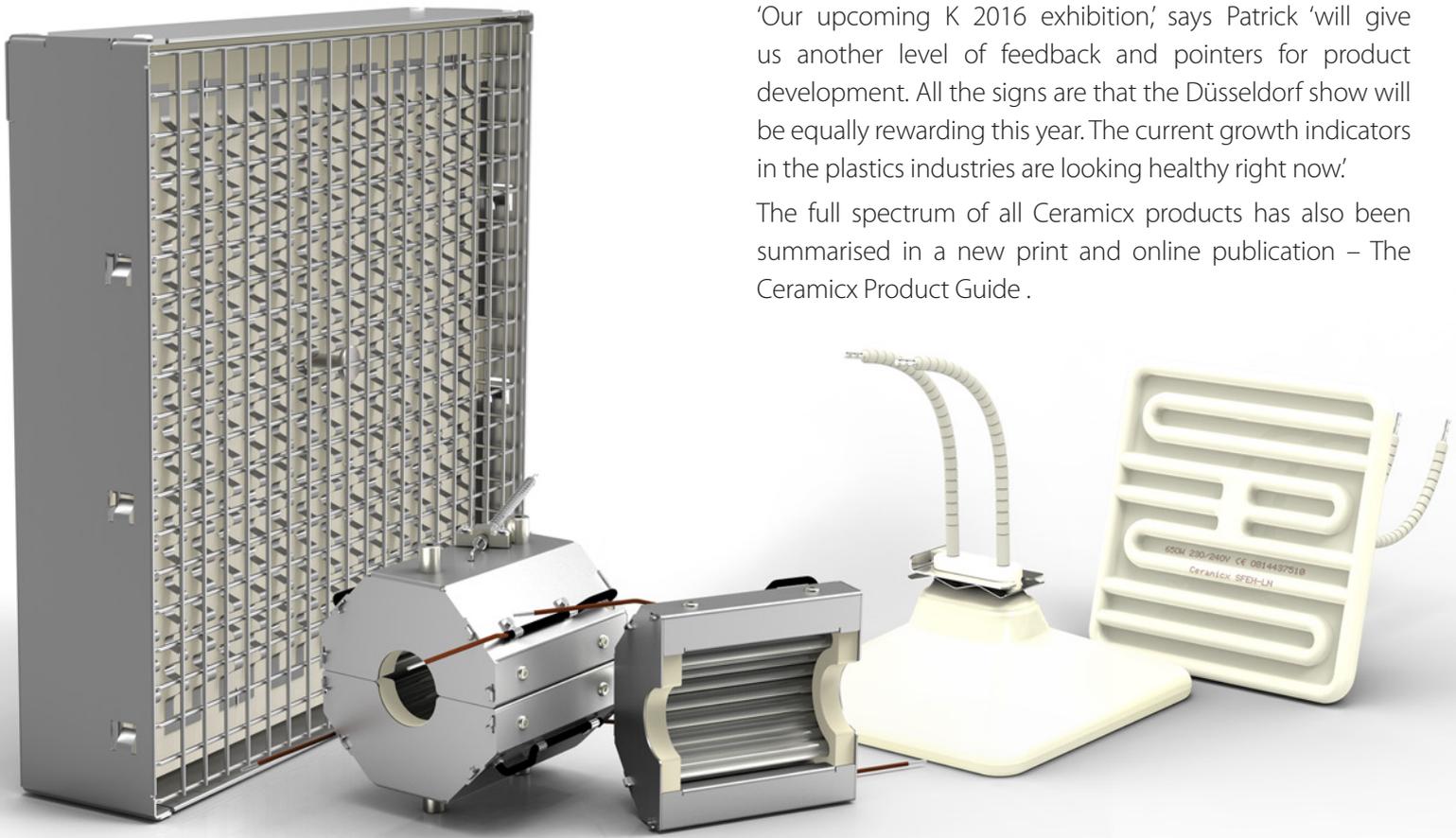
The Ceramicx SFEH-LN was the result; a new product launch, that was designed and made specifically for the Chinese market. The SFEH-LN comes in 2 wattages, 400w and 650w with ring terminals.

'The Chinaplas reception to our new product was outstanding,' says Wilson, 'giving our customers significant cost savings in overall thermoforming machine-build.'

The 'feet on the street' Ceramicx strategy in China continues to help the market penetration there. Next year will be the company's 6th successive Chinaplas exhibition, organized with local partners GSAE and hosted in the British Plastics Federation pavilion at the show.

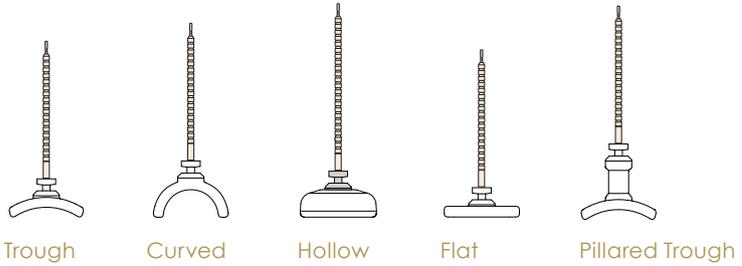
'Our upcoming K 2016 exhibition,' says Patrick 'will give us another level of feedback and pointers for product development. All the signs are that the Düsseldorf show will be equally rewarding this year. The current growth indicators in the plastics industries are looking healthy right now.'

The full spectrum of all Ceramicx products has also been summarised in a new print and online publication – The Ceramicx Product Guide .



The newly developed Ceramicx furnace heater, Curved quartz element with thermocouple designed for a customer, Square flat element hollow - long neck (SFEH-LN) for the Chinese market.

CERAMIC ELEMENTS



Trough

Curved

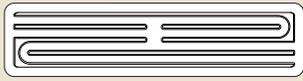
Hollow

Flat

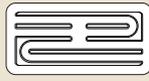
Pillared Trough

CERAMIC TROUGH ELEMENTS

www.ceramicx.com/trough-elements/



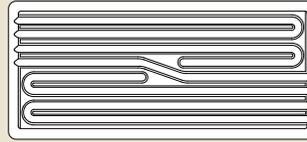
FTE / FTE-LN



HTE



QTE / QCE



LFTE

FTEL - LN

FTE Full Trough Element	245 x 60 mm	150W 250W 300W 400W 500W 650W 750W 1000W
HTE Half Trough Element	122 x 60 mm	125W 150W 200W 250W 325W 400W 500W
QTE Quarter Trough Element	60 x 60 mm	125W 250W
QCE Quarter Curved Element	60 x 60 mm	150W 250W
LFTE Large Full Trough Element	245 x 110 mm	1000W 1500W
FTE-LN Full Trough Element -Long Neck	245 x 60 mm	250W 400W 500W 650W
FTEL-LN Full Trough Element Long - Long Neck	285 x 60 mm	1000W

CERAMIC HOLLOW ELEMENTS

www.ceramicx.com/hollow-elements/



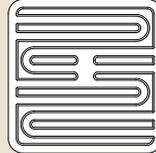
FFEH



HFEH



QFEH



SFEH

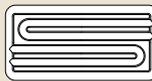
FFEH Full Flat Element Hollow	245 x 60 mm	250W 400W 500W 600W 800W
HFEH Half Flat Element Hollow	122 x 60 mm	125W 200W 250W 300W 400W
QFEH Quarter Flat Element Hollow	60 x 60 mm	125W 200W
SFEH Square Flat Element Hollow	122 x 122 mm	250W 400W 500W 600W 800W

CERAMIC FLAT ELEMENTS

www.ceramicx.com/flat-elements/



FFE



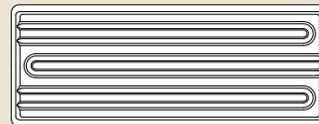
HFE



QFE



SFSE

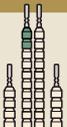


LFFE

FFE Full Flat Element	245 x 60 mm	150W 250W 300W 400W 500W 650W 750W 1000W
HFE Half Flat Element	122 x 60 mm	125W 150W 200W 250W 325W 500W
QFE Quarter Flat Element	60 x 60 mm	125W 250W
SFSE Square Flat Solid Element	122 x 122 mm	150W 250W 300W 400W 500W 650W 750W
LFFE Large Full Flat Element	245 x 95 mm	150W 750W 1400W

THERMOCOUPLES

www.ceramicx.com/thermocouples/



Thermocouple Type K
+ Nickel Chromium
- Nickel Aluminium



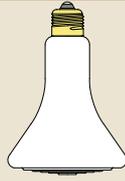
Thermocouple Type J
+ Iron
- Copper Nickel



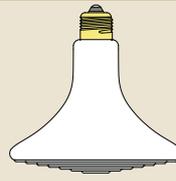
ESEB



ESES



ESER



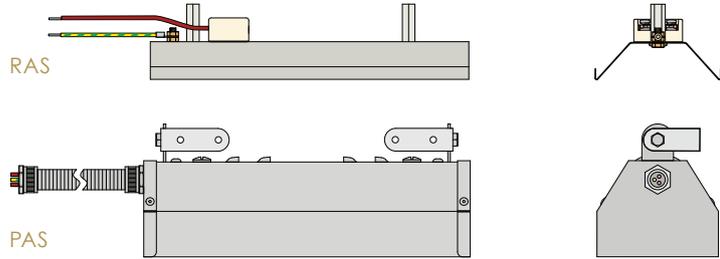
ESEXL

- ESEB** Edison Screw Element Ball
- ESES** Edison Screw Element Small
- ESER** Edison Screw Element Regular
- ESEXL** Edison Screw Element Extra Large

Ø65 x 140 mm	60W 100W
Ø80 x 110 mm	100W
Ø95 x 140 mm	150W 250W
Ø140 x 137 mm	400W

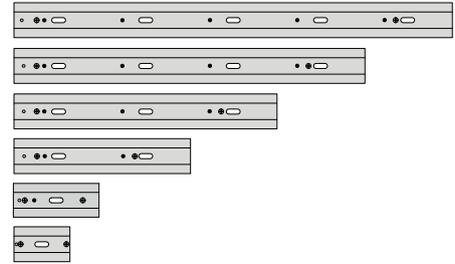


REFLECTORS / PROJECTORS



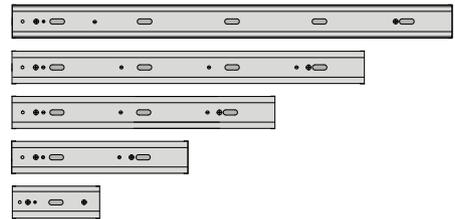
REFLECTORS

- RAS 5** Reflector Aluminised Steel 5 1,254 x 100 mm
- RAS 4** Reflector Aluminised Steel 4 1,004 x 100 mm
- RAS 3** Reflector Aluminised Steel 3 754 x 100 mm
- RAS 2** Reflector Aluminised Steel 2 504 x 100 mm
- RAS 1** Reflector Aluminised Steel 1 254 x 100 mm
- RAS 0.5** Reflector Aluminised Steel 0.5 160 x 100 mm

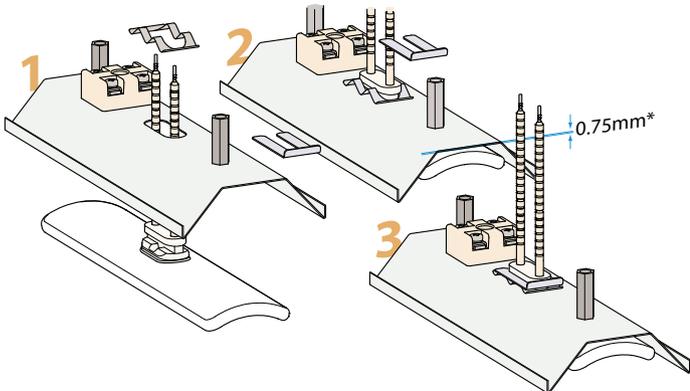


PROJECTORS

- PAS 5** Projector Aluminised Steel 5 1,258 x 94 mm
- PAS 4** Projector Aluminised Steel 4 1,008 x 94 mm
- PAS 3** Projector Aluminised Steel 3 758 x 94 mm
- PAS 2** Projector Aluminised Steel 2 508 x 94 mm
- PAS 1** Projector Aluminised Steel 1 258 x 94 mm

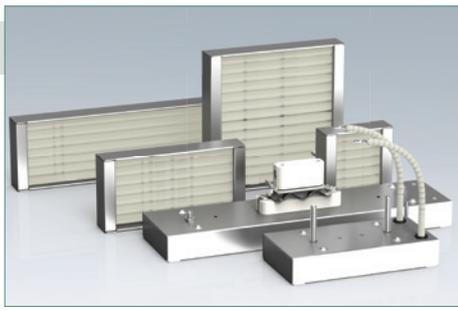


INSTALLATION OF PILLARED ELEMENTS

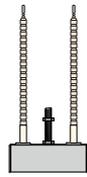


Recommended Slot hole size 42 x 15 mm
1.6535" x 0.5905"

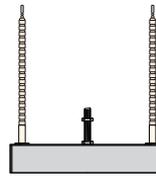
▼ Recommended reflector thickness 0.75 - 0.9 mm
0.0296" x 0.0354"
min/max thickness 0.5 - 1.5 mm



QUARTZ ELEMENTS



Standard



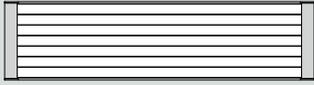
Square



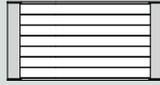
Pillar

STANDARD QUARTZ ELEMENTS

www.ceramicx.com/standard-quartz-element/



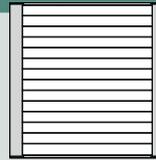
FQE



HQE



QQE



SQE

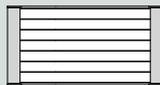
FQE Full Quartz Elements	247 x 62.5 mm	150W 250W 400W 500W 650W 750W 1,000W
HQE Half Quartz Element	124 x 62.5 mm	150W 250W 400W 500W
QQE Quarter Quartz Elements	62.5 x 62.5 mm	150W 250W
SQE Square Quartz Element	124 x 124 mm	150W 650W 1,000W

PILLARED QUARTZ ELEMENTS

www.ceramicx.com/pillared-quartz-elements/



PFQE



PHQE

PFQE Pillared Full Quartz Elements	247 x 62.5 mm	150W 250W 400W 500W 650W 750W 1,000W
PHQE Pillared Half Quartz Element	124 x 62.5 mm	150W 250W 400W 500W

CURVED QUARTZ HALF ELEMENTS



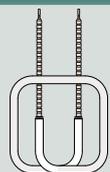
CQHE



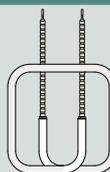
CQHE 500 Curved Quartz Half Element 500mm	500 x 100 x 62 mm (inc stand off's)	Wattage 1,250W
CQHE 250 Curved Quartz Half Element 250mm	250 x 100 x 62 mm (inc stand off's)	Wattage 625W
CQHE 100 Curved Quartz Half Element 100mm	100 x 100 x 62 mm (inc stand off's)	Wattage 250W

SQUARE QUARTZ TUBE ELEMENTS

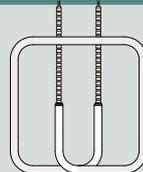
www.ceramicx.com/quartz-square-tube-elements/



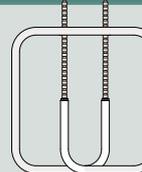
STQH 100



STQH 112

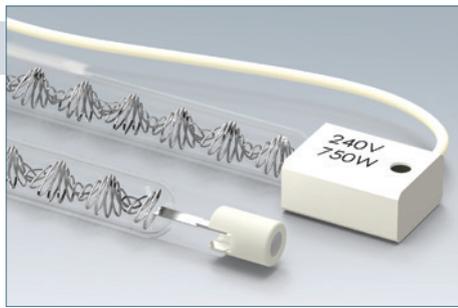


STQH 140

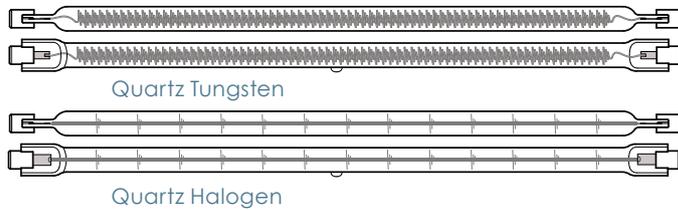


STQH 150

STQH100 Square Tube Quartz Heater	100 x 100 mm	150W - 400W
STQH112 Square Tube Quartz Heater	112 x 112 mm	150W - 400W
STQH140 Square Tube Quartz Heater	140 x 140 mm	150W - 650W
STQH150 Square Tube Quartz Heater	150 x 150 mm	150W - 650W

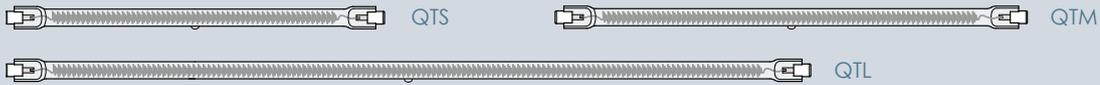


QUARTZ TUNGSTEN / HALOGEN



QUARTZ TUNGSTEN TUBES

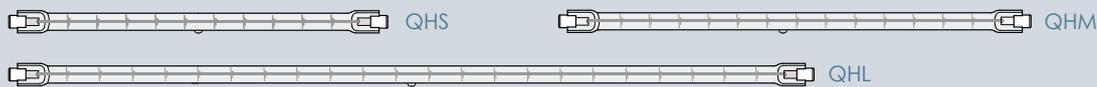
www.ceramicx.com/fast-medium-wave-emitters/



QTS Quartz Tungsten Short	Ø10 x 244 mm	750W
QTM Quartz Tungsten Medium	Ø10 x 277 mm	1000W
QTL Quartz Tungsten Long	Ø10 x 473 mm	1500W 1750W 2000W

QUARTZ HALOGEN TUBES

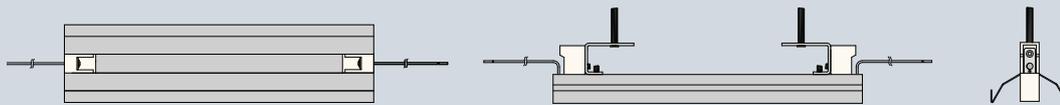
www.ceramicx.com/short-wave-emitters/



QHS Quartz Halogen Short	Ø10 x 244 mm	750W
QHM Quartz Halogen Medium	Ø10 x 277 mm	1000W
QHL Quartz Halogen Long	Ø10 x 473 mm	1500W 1750W 2000W

QUARTZ TUNGSTEN/HALOGEN REFLECTORS

www.ceramicx.com/reflectors/

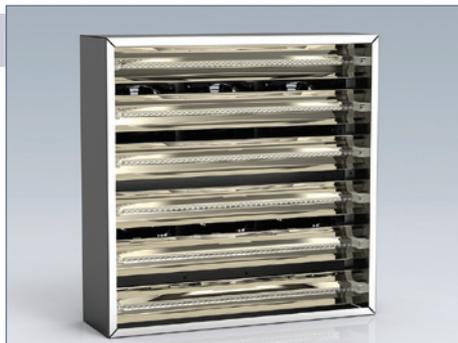


QTSR Quartz Tungsten/Halogen Short Reflector	250 x 62 mm	(Suitable for QTS/QHS, Tubes supplied separately)
QTMR Quartz Tungsten/Halogen Medium Reflector	300 x 62 mm	(Suitable for QTM/QHM, Tubes supplied separately)
QTLR Quartz Tungsten/Halogen Long Reflector	497 x 62 mm	(Suitable for QTL/QHL, Tubes supplied separately)

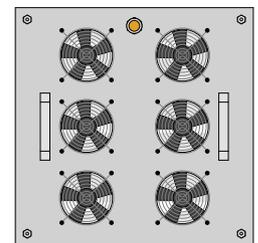
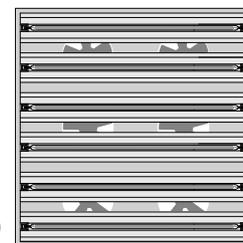
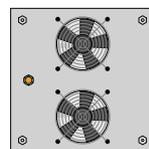
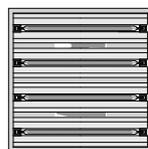
SPECIAL TUBE ORDERS

www.ceramicx.com/special-tube-orders/

Ceramicx can supply other types of Halogen/ Tungsten elements, of varying design, dimensions, length, coatings, terminations and electrical rating.



FAST IR

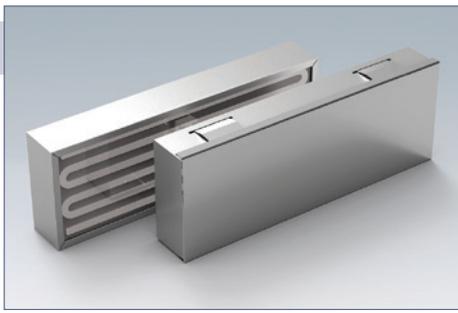


FAST IR

www.ceramicx.com/fastir-systems/

FastIR 305 Suitable for 1000W Quartz Tungsten/Halogen Heaters QTM/QTH (tubes sold separately)	305 x 305 x 150 mm	4 Tube 4kW	5 Tube 5kW
--	--------------------	-------------------	-------------------

CUSTOM PANEL HEATERS



Custom Panel Heaters.
Available with anodised aluminium or ceramic glass face.
Range of Wattages and Voltages.
Multi-zone options with removable miniature thermocouple plug.

TEST OVENS



1.5kW bench top material test unit.



8kW bench top test unit supplied with 3 interchangeable infrared heating platens consisting of Ceramic, Quartz and Quartz Tungsten/Halogen Tubes.

The three pieces of lab test equipment shown are tools for determining the best emitter for a given material or job. All are available from Ceramicx, where the first two should be found in the arsenal of any serious user of infrared heat. The Herschel shown right will only appeal to select clientele due to its deep dive scientific nature and cost.

All testing and subsequent reports are also available from Ceramicx.

*The Herschel 3D IR Imaging Machine (see Heatworks 11 for full details)
The Herschel is an IR energy mapping instrument, and comprises an ABB robot, a state of the art Infra Red sensing element, and a sophisticated computer processed graphics suite. The instrument was named after Sir Fredrick William Herschel, the discoverer of Infrared Radiation. The Herschel can be used to evaluate and verify heat work solutions in industry including automotive, plastics, composites and aviation and is also indispensable in research and development.*

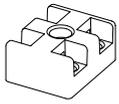


SPECIALISED STEATITE COMPONENTS www.ceramicx.com/specialised-dust-press-components/

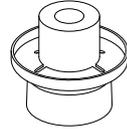
Ceramicx now offers the manufacture of specialist Steatite ceramic dust press components to companies that need quality insulators as part of their product manufacturing. For over twenty years Ceramicx has been shipping components and products to manufacturers in over 65 countries worldwide. Service, confidentiality and world class quality is offered, together with a unique know-how in developing and designing product solutions in Steatite Ceramic where needed.



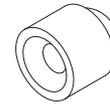
Ceramicx manufactures dust press components on Dorst 20 and 15 tonne presses (shown above) and a Dorst 6 tonne press

2P Ceramic Terminal Block

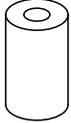
10 Pack
no Fittings
40 x 32 x 20 mm

Ceramic Grommet and Starlock

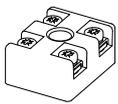
Fastener Set 100 sets
per pack - used as an
Insulator in sheet metal
with 6mm hole
21 x 18 x 15 mm

Ceramic Beads

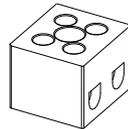
per kg
Loose or Strung
Ø5 x 6 mm
4.5 mm to shoulder

Ceramic Tubes

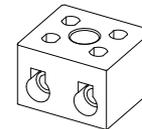
Ø5 x 11 mm

ACCESSORIES**HIGH TEMPERATURE CONNECTORS**www.ceramicx.com/high-temperature-connectors/**2P Ceramic Terminal Block**

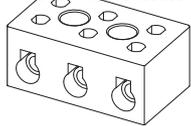
10 Pack
Stainless Steel
Fittings
40 x 32 x 20 mm

2P Mini Ceramic Terminal Block

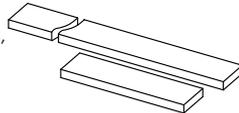
10 Pack
Nickel Galvanised Brass
Inserts, Zinc-plated Steel
Screws
21 x 18 x 15 mm

TB2 Ceramic Terminal Block

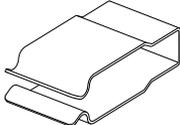
(closed) 10 Pack
Plated Brass Inserts,
Nickel Galvanised
Screws
34 x 30 x 22 mm

TB3 Ceramic Terminal Block

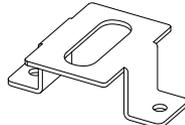
(closed) 10 Pack
Plated Brass Inserts,
Nickel Galvanised
Screws
51 x 30 x 22mm.

Stainless Steel Buzz Bar

used with the ceramic
terminal block to
produce a flexible power
distribution system
8 x 2 x 1000 mm

MOUNTING COMPONENTSwww.ceramicx.com/mounting-components/**Flat Ceramic Base Holder**

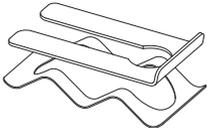
For Halogen/Tungsten
heaters fitted with flat
ceramic base

Mounting Bracket

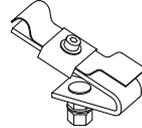
For ceramic elements
72 x 57 x 28 mm.
slot 42 x 15 mm

R7s Ceramic Holder

For Standard Quartz
Tungsten/Halogen Tubes

Steel Wave and Spring set

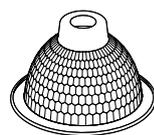
Used in the mounting
and installation of all
Ceramic elements
and the Pillared
Quartz elements

STQH Holder

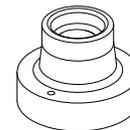
For all types of square
tube Quartz Heaters
(STQH)

E27 ACCESSORIESwww.ceramicx.com/bulb-reflector-and-e27-holder/**E27 Edison Bulb Holder**

High temperature
porcelain holder used
with ceramic IR bulbs
Ø53 x 74 mm

Ceramic Bulb Reflector

Highly polished
reflector for use
with ceramic IR bulbs
Ø220 x 110 mm

E27 Bulb Holder with Base

High temperature
porcelain holder used
with ceramic IR bulbs
Ø78 x 60 mm

HIGH TEMPERATURE NPC CABLEwww.ceramicx.com/high-temperature-npc-cable/**High Temperature NPC Cable**

Single Conductor Cable, Flexible Nickel Plated Copper Core, Glass Fibre Insulation, Silicone Coated Fibreglass Braid
0.75 mm, 1.5mm, 2.5mm, 4.0mm

Talk to us today about your infrared heating needs.



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Operations Manager

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Siemens Financial Services now available

With over 40 years' experience of providing finance to businesses, Siemens Financial Services (SFS) has been helping finance the future of manufacturing with its innovative and competitive financial solutions.

Initially focused around office technology and healthcare equipment SFS has more recently aligned itself closely with the engineering and manufacturing heritage of the broader Siemens. SFS is now placing a focus on delivering credit to customers of machine tooling and plastics industry manufacturing equipment - (whether OEMs or resellers).

SFS offers a selection of tailored asset finance options for manufacturing businesses* - including Hire Purchase, Finance Lease and Operating Lease.

So if you are an established business with a strong business plan purchasing an infrared solution from Ceramicx, there is a financing solution for you.

**Finance for businesses and other non-consumer opportunities only, subject to credit approval. This is not an offer to provide finance or any other terms. Quotations are subject to changes in funding costs, tax assumptions and credit policy. Any offer to provide finance will be subject to credit approval by Siemens Financial Services Limited and subject to terms and conditions. Provision of finance is subject to Service, Administration, Facility and Annual Services Fees*



CERAMICX AS AN INFRARED OVEN OEM SUPPLIER IS PLEASED TO ANNOUNCE THAT IT IS NOW AN APPROVED COMPANY OF SERVICES (SFS).

SIEMENS FINANCIAL SERVICES (SFS) IS HAPPY TO SPEAK WITH ANY CUSTOMERS OR POTENTIAL CUSTOMERS OF CERAMICX WITH RESPECT TO FINANCING THEIR CAPITAL NEEDS.



Product Guide



The Ceramicx Product Guide.

Our publication outlines the complete range of Ceramicx infrared heating products for industry, commerce and consumers.

The Guide is intended for buyers and users of our infrared heating components and equipment.

The Guide will also be useful to stockists, distributors and agents around the world and to general readers who wish to gain an understanding of the world of infrared heating.



ONLINE INFRARED TRAINING COURSE

The course is divided into four modules that set out the basics of Infrared from an Industry perspective.

Each module will take 60-90 minutes to complete and finishes with a short online test. The modules can be taken online, or taught as part of a classroom course.

Further information can be found inside on pages 8 and 9.

The course is now available online at

www.ceramicx.com/applications-training/



Module 1
Fundamentals of Heat Transfer and Infrared

Module 2
Infrared Energy in Process Heat

Module 3
Matching the Infrared Element to the Application

Module 4
Control of Infrared