HeatWorks

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IR HEAT WORK SOLUTIONS

CERAMICX HEADS FOR CAMX 17

WECO INTERNATIONAL
US MARKET LEADING THE WAY

GSAE
BUILDING THE PARTNERSHIP

CERAMICX TURKEY
65% GROWTH

Star performers - and stellar marketplaces

Welcome to the pages of the 18th edition of HeatWorks magazine.

At this point in time you find Ceramicx between one corner of the world and another: Back in May, and once again, we enjoyed a very successful Chinaplas'17 exhibition, greeting many friends old and new and welcoming new business - not just from China but from many other corners of the Far East and also the Middle East.

And now, thanks to our friends and distributors at Weco International, we are set to head west to Orlando, Florida for the USA's premier Composites manufacturing show, CAMX, September 12-14th. None of this marketing activity would be at all possible without the expertise and the excellence of our associates on the ground – the 'feet on the street' as Weco MD, Brett Wehner puts it.

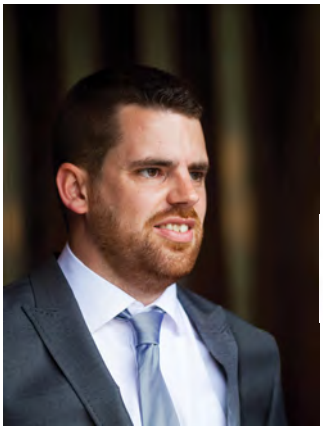
Which is why we have taken a little time out in this magazine edition in order to profile our best-selling distributors, outline the features of their particular marketplaces and some of their successes with Ceramicx.

China, for example, drills deep with us, taking full advantage of our QA capabilities and our abilities to build elements and components to order. We are always delighted to support innovation in the Chinese marketplace in this manner. And the Shanghai 2018 Chinaplas show will give us renewed opportunity to serve that marketplace with further IR heating innovation.

North America, on the other hand, tests our ingenuity and ability to build complete and closed loop IR heating systems for a variety of customers, especially those working in our top three sectors of aerospace, automotive and packaging. US manufacturing has never been afraid to innovate and reach for the new and untried. Ceramicx is more than happy to play its part - pushing the envelope for IR heating applications.

This magazine edition also puts the spotlight on Ceramicx Turkey – a rising star in our global outreach. Hasan Duman's team in Istanbul continues to win friends and influence machine builders in that country's expanding marketplace. The quality of design and engineering personnel in Turkey is second to none. Ceramicx intends to enlist and make full use of it throughout all our group activities.

Elsewhere in these pages we bring you updates on our machining and technical abilities; a reminder of all our elements and quartz products (via our new Product Guide and Online Shop) together with many other developments from the past few months. We hope you enjoy the content here. Please don't hesitate to get touch with us with any heating news or any matters on Infrared heating for industry. As ever, we thank you for your interest.



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HeatWorks

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Weco teamwork grows the IR heating gospel

In between plane journeys HeatWorks magazine caught up with Weco International's Technical Sales Specialist, Brett Terbrack to get a snapshot of how the important US market is leading the way for Ceramicx machine build and IR heat solutions.

In between plane journeys HeatWorks magazine caught up with Weco International technical sales specialist Brett Terbrack to get a snapshot of how the important US market is leading the way for Ceramicx machine build and IR heat solutions.

Brett's sales and marketing efforts for Weco International across the North American continent continue to build up sales in an impressive manner. The territory is large – not simply because of geography but also for the great variety of IR heating needs in US business and manufacturing. In addition, a significant new horizon is also opening up in the composite materials sector.

Weco's 'feet on the street' philosophy means that the business gets close to the customer's IR heating needs through personal contact, visits and by understanding the true needs of each manufacturing situation.

Brett notes that 'our projects and our customers continue to become more complex. Everyone in the partnership has stepped up to the mark and has handled the increasing throughput exceptionally well.'

In essence, this overall success comes from a great Weco / Ceramicx team that communicates well with each other.

Our US customers come to us and ultimately purchase from us because of our advanced Infrared heating know how – based on the scientific fact and proven workable technology. Not only do we provide a solution we also help them through the IR 'knowledge gap' that Ceramicx founder Frank Wilson often refers to.

Such knowledge – evident, for example, in the Weco test oven set-ups, or in the Ceramicx Herschel test instrument - makes all of our jobs much easier by providing strong and scientific backing and confidence to buy.'

The proof of the pudding is in the recent Weco sales numbers: In 2016 56% of all quotes were turned into an order. In 2017 thus far 58% of all quotes have turned into an order

The year 2016 was an outstanding year for Weco sales figures and was notable for some of the largest and most complex projects ever undertaken by the Ceramicx / Weco partnership. 2017 thus far looks to be cut from the same cloth, showing 27% ahead of 2016. The growth continues.

Tony Tenore, Candice Budnik, Brett Wehner CEO, Brian Lord, Lori Crossen, Brett Terbrack

Brett says that 'I feel confident in saying that all of Weco's US competitors just sell heaters. Weco/Ceramicx provide solutions. There's a very big difference between selling a customer the heater they ask for and providing the correct IR heating solution that will actually fulfil their needs and even exceed their expectations.

Brett stresses the point that the Weco approach is a team effort. Central to the process is the role played by Weco owner and director, Brett Wehner.

'Brett Wehner is key. His proven track record as a successful business owner and his calm demeanour in the eye of the

storm is helping take us up to the next level. No matter how intense the situation Brett makes an educated decision in creating results for satisfied customers every time - leading to great reputation and repeat business.'

Brett continues to checklist the Weco team members:

Tony Tenore continues to implement improved pricing, distribution, order minimums, and various other structures that have improved and streamlined our IR heater sales with OEMs, distributors, and end users. Tony is also a key person at the start up of projects and provides great after sales service on delivered projects.

Brian Lord has led the charge on residual replacement business and on potential new customer contacts. Brian is constantly in touch with businesses we have not heard from in some time. He also reaches out to businesses we have never talked to before but with whom we know there is win-win opportunity.

Lori Crossen continues to be critical to communication between Ceramicx, our accounting department, sales department and the warehouse. You name it - Lori has a pulse on it. Not to mention that she handles many quotes and new customers!

Candice Budnik has recently joined and is doing a great job in helping support internal office efforts and, more specifically, tracking the projects step by step. Something that became an absolute necessity!

According to Brett our key markets by sector have become:

Aerospace - with an emphasis on composites due to our exclusive proprietary heater technology, achieving things that no one thought could be possible!

Automotive – The industry is largely savvy to the various uses of Infrared heating. However, the Weco/Ceramicx team has succeeded in putting together and implementing advanced manufacturing systems that no one else has seen before. The Word is spreading in Motor City and its suburbs.

Packaging - especially in retrofit and where old ovens need new technology. Proven systems such as those achieved for global giant Linpac Packaging make Weco the go to option for upgrades.'

All in all Weco feels very confident about continuing growth in US markets for Ceramicx technology and engineering. Brett says that 'Ceramicx is currently knocking it out of the park in terms of sophisticated and large scale machinery and system build for IR heating in the USA.

Weco is therefore fully confident in quoting for the most complex and large scale IR heating needs. We have the capability to deliver at the front end and thanks to Ceramicx we also have all the IR scientific and technical support at our backs.'

USA – still No 1

Ceramicx exports IR heating products and systems to over 62 countries in the world. Like an affectionate parent unwilling to choose we love all our 'children' dearly.

However, about five years ago I was tasked by the HeatWorks magazine editor to name our leading country marketplace. At that time – and although China, Germany, Turkey, the UK are all great contenders – I named the USA. Today I do so again.

The day may surely come when China surpasses anything achieved in the West - for quality, quantity and sheer inventiveness. But until that day, in my view the United States remains in the vanguard of industrial and scientific development, embracing IR heat development and innovation.

The USA today still has something of the spirit of its founding fathers – the relentless and driving commercial appetite to make things happen.

Over the past 18 months - and subsequent to our partnership with Weco at the NPE Plastics exhibition - Ceramicx is noticing a fresh intake of appetite and ambition in our Weco partners – and in American manufacturing business; to grasp the nettle of lowering energy costs and increasing efficiencies through effective Infrared heat work.

We are delighted to meet this renewed appetite with all that our new manufacturing facilities can deliver. Our CAMX joint venture in Orlando, Sept 11-14 will bring fresh vigour to a partnership that is nearly as old as Ceramicx itself.

Frank Wilson
Managing Director,
Ceramicx Ltd.

Ceramicx heads for CAMX '17

September will see the Ceramicx/Weco team back in Orlando Florida. On this occasion the joint venture will be bringing IR heat solutions to the Composites and Advanced Materials EXPO (CAMX).

From the beginning the USA has been a very special market for Ceramicx; primarily in terms of IR heat solutions for thermoplastic processes, thermoforming especially. America's National Plastics Exposition (NPE) has served us well in that regard and its relocation to Orlando, Florida (from Chicago) has been an unqualified success.

Ceramicx is therefore delighted to not only be renewing and expanding our services, products and presence in the growing US composites field - but to also be returning to the Orlando Convention Centre to do so. The space is a familiar one and we are delighted to be using it in order to dive into the heartland of America's composites and advanced materials industries.

CAMX

THE COMPOSITES AND ADVANCED MATERIALS EXPO

11th - 14th SEPT 2017

Orange County Convention Center, Orlando, Florida.

STAND T53

Our first time experience at Europe's JEC exhibition back in March of this year gave us enough headwind, enthusiasm and US-based enquiries to decide to take our business to the CAMX exhibition this coming September 11-14.

Ceramicx will man our Infrared heating solutions booth at the show in partnership with our long time US associate and distributor, Weco International. Our test ovens and our Herschel test instruments are also very much in demand for this most exacting of marketplaces.

Despite many and various advances around the world, it is my view that US-based manufacturing – aerospace and automotive especially – from Howard Hughes onward have been the key global driver for competitiveness in composites, in other words, for the early adoption of new materials and lightweighted structures.

It is therefore our intention to use the CAMX September show to learn much in depth about our US visitors and customers and the various industries that they serve. Our new Out Of Autoclave (OOA) oven solution, The Vector, will also be part of the mix.

CAMX is the USA's largest, most comprehensive composites and advanced materials event for products, solutions, networking, and advanced industry thinking. The event combines the strengths of two leading trade associations, ACMA and SAMPE, to deliver the right exhibitions, the right educational programs, and the right people – all in one place. We anticipate a number of successful experiences at CAMX '17 and look forward to the outcomes.

A commitment to composites

The year Is only just over half way through and already Ceramicx has achieved several firsts in our composites marketing

In summary; February saw Ceramicx visit AC Marine Southampton as part of our Composites UK membership; in March we exhibited at the prestigious JEC Show Paris (picking up a number of important leads and orders), May 10-11 saw us exhibit and present at the Warwick Manufacturing Group as part of the automotive focus there. This coming September sees us in Orlando Florida, supporting our USA distributor, Weco at the annual US exhibition for the industry – CAMX (please see facing page for further details).

In my view the composites sector is on the threshold of a sea change and an opportunity that it has no option but to take: Wherever Ceramicx finds itself in the world the same message presents itself, time after time. The composites industries face unprecedented demand, the like of which the world has not yet seen.

The global aerospace civil aviation sector alone is set to ramp up from 60 planes produced each month to over 200 a month by the year 2023. This is unknown territory for all concerned, and will engender all kinds of issues in the years ahead.

What we are witnessing is an industry that faces boom opportunities but also huge issues of information dissemination and cross-sector communications – concerning technology, material and process developments and challenges that are not unique to any one end-use sector.

Many factors are combining to play a role in this heightened future demand. Light-weighting of parts, for example, is tied up in the drive to hit various CO2 targets set out in global legislation

OEM manufacturers are also demanding more cost effective processing methods to reduce part cost. The means reducing the CAPEX spend for processing equipment and also the energy expenditure for each part. Many of these manufacturers clearly want to move away from the prepreg/autoclave combination to a system of automated tape or fibre laying/placement (ATL/AFP) with resin injection.

Ceramicx is ready and able to match this demand with a variety of Infrared heating solutions; custom-made machinery builds and also our proprietary Out Of Autoclave (OOA) ovens such as The Vector. In that sense the future for our composites business looks very positive.

The Vector, out of autoclave oven.

However, Ceramicx is also mindful of our responsibility to raise the awareness and the profile of the Infrared heating industry and its technical opportunities within composites.

This year's JEC show was very important in that regard. Ceramicx put a marker down; bringing its unique Infrared technology and oven innovations to Paris, France March 14-16.

With more than 100 countries represented, 37,000 visits and 1,300 exhibitors, JEC World is the largest international show of the composite industry. Ceramicx IR oven build and services are serving an increasing OEM and end-user market, primarily located in aerospace, automotive, defence and boat building.

The Paris show saw a great number of new contacts added to existing friends and customers in the industry. Paris also gave us the opportunity to preview the launch of the Ceramicx Vector drape forming machine, designed to heat and cure carbon composite material whether its prepreg or dry fibre.

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

In almost any stage where thermal energy is required in the composite manufacturing process, Ceramicx can help formulate specific heatwork packages for individual company needs. Please contact Ceramicx directly for further details.

China leads the way

China and the Chinaplas exhibition are becoming increasingly important to Ceramicx. Overleaf we report on GSAE, the Ceramicx Chinese distributor that has achieved outstanding results for us throughout the past five years. Here we cover the expanding Chinaplas show.

For the 6th successive year Ceramicx successfully invested in the Chinese market via the Chinaplas show.

Our four exhibition days in Guangzhou this May put the cap on a year that has effectively doubled Ceramicx turnover in China. The bar is now set very high indeed for our eighth year of business in Chinaplas Shanghai 2018. We are already looking forward to it and in the expert company once again of our agent Mr Xu Shan and our distributor GSAE.

This year saw the Ceramicx Furnace Infrared Heater introduced at Chinaplas. This is a new product that is all about the power and heats up in no time at all. It was very well received. Meantime our classic FTE, SFEH, FQE products continue to be the "go-to" products for many customers – China included. They perform exceedingly well in very many applications and so many of our customers don't feel any need to change that.

Chinaplas 2017, Mr Patrick Wilson, Production Manager, Ceramicx and Mr Peter Li, General Manager, GSAE hold discussions.

Customer demand at Chinaplas 2017 came in from all across the board - for all three kinds of IR emitter, as well as for Ceramicx technical services in product development, oven systems and for our IR heat testing services.

Ceramicx enjoyed a steady flow of Chinese based enquiries - and some orders on every day of the exhibition and also welcomed a significant number of Middle Eastern visitors onto our stand. This year's exhibition seemed to host a limited number of European visitors. Perhaps the Shanghai Chinaplas venue holds more popularity in that regard. We shall find out next year.

The Ceramicx brand and the IR heating message is really punching its weight in China today; for machine builders, for busy thermoforming businesses and for all those seeking a cleaner, greener use of energy – with lowered operating cost.

Last year we wanted to demonstrate our cutting edge expertise in infrared heat technology for the thermoforming equipment builders in that market.

The Ceramicx SFEH-LN was the result; a new product launch, that was designed and made specifically for the Chinese market and the Chinaplas reception to our new product was really outstanding; giving our customers significant cost savings in overall thermoforming machine-build.

This year the volume of interest and enquiries showed that we were still reaping and consolidating the benefit from that particular piece of work. A couple more years of similar 'go forward' and Ceramicx will dominate infrared element sales in the Chinese market.

The triennial K show in Düsseldorf may still retain the technological edge for plastics technology, R&D and innovation - but only just. My view is that the K phenomenon will be surpassed by the Chinaplas enterprise.

In my view the sheer scale of the event and of the Chinese marketplace makes such a development inevitable. The Chinaplas exhibition area – in Guangzhou at least - covers over a quarter of a million square meters of floor space; an area which is growing by 10,000 sq. meters each year.

Taking a cue perhaps from last year's K show, Smart factory systems, ideas and Industry 4.0 topics provided the 2017 conference themes, background context and talking points.

In summary, our Chinaplas-based business goes from strength to strength and we shall continue to participate and serve the market there for indefinite time to come.

(left) Marius Xiu Qun, Sales Director, Guangzhou Salaimi, specialized in infrared heating industry for 10 years. (right) Mr. Hu An Yu, Sales Manager, East China, specialized in infrared heating industry for more than 5 years.

Building the GSAE partnership

As reported on the previous page, Ceramicx celebrated its 7th year at Chinaplas in May 2017 with Mr Xu Shan and the GSAE team.

Mr Li Ping Qiang (Peter Li) General Manager of Guangzhou Salaimi, specialised in infrared heating industry for 11 years.

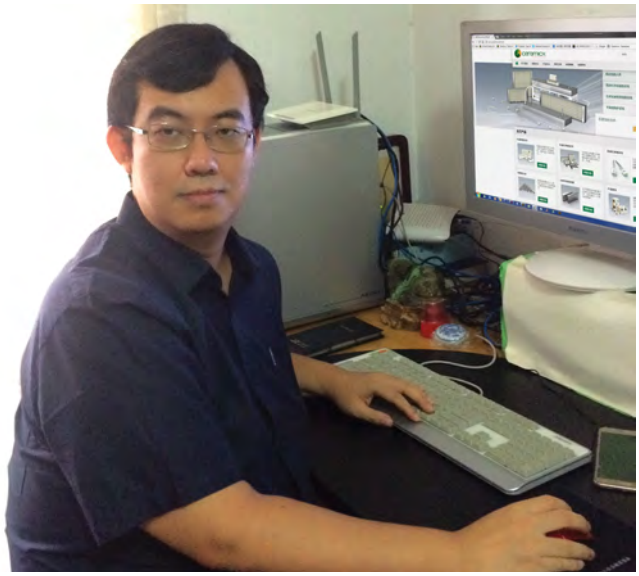
Guangzhou Salaimi Automation Equipment Co. Ltd represents Ceramicx for product sales and service in China, including Taiwan, Hong Kong and Macao. GSAE has succeeded in further penetrating the geographical Chinese territories of Guangzhou, Beijing, Shanghai, Qingdao; Shantou and Taiwan.

GSAE continues to invest in its people, infrastructure and market penetration, increasing the opportunities for Ceramicx products in the market. The company is extremely focused on introducing advanced IR technology and IR technical application level to these markets, deploying its own matrix of QSPT principles: Q-quality, S-Service, P-price, T-time.

The Ceramicx partnership with GSAE was established when, with Mr Xu Shan as his guide, Ceramicx founder Frank Wilson visited the Chinaplas 2010 exhibition in Shanghai. Both men visited many potential customers on this first visit - building a good base for future cooperation and business. Ceramicx was then introduced to Mr Peter Li and his GSAE company.

The rest, as they, say is history: In 2012 Ceramicx made its first exhibiting appearance at Chinaplas. Mr Xu Shan and Mr Li's team set to work and within one year Ceramicx sales were raised 150%.

Ceramicx customization for the Chinese market began some years back with work for the FQE/HQE/SQE series of products; increasing the heat dissipation and prolonging the service life of the heater. The Ceramicx SFEH series products featured newly added x tubes for power leads and T/CK leads and specially designed new ring terminations were also made for the Chinese market, increasing contact with wires and making the electrical signal more stable. Last year Patrick Wilson, Ceramicx Production Manager successfully oversaw the introduction of a successful 'flat hollow' IR element line created just for that market. The expertise and commitment of Mr Peter Li and his company and the linguistic and technical skills of Mr Xu Shan, also known as Wei Wei – have made a significant contribution.



Mr Xu Shan, General Manger, HENN GROUP China, has cooperated with Ceramicx since 2005 and has specialised in the packaging and print industry for over 13 years.

The continuous presence of the Ceramicx brand and the quality that GSAE brings have made it very clear to the Chinese market that Ceramicx is there permanently. Custom-made products, IR training, JIT supply and attentiveness to the need of machinery builders are just a few factors that are helping our double digit growth in what is a truly vast and all-encompassing industry.

Long service life, high performance and customization abilities have now been well established for Ceramicx IR heating products.

Thanks to GSAE the Chinese market is very well conversant in the fact that Ceramicx makes and supplies world-class quality in all three kinds of IR components – ceramic elements, quartz elements and quartz tungsten elements.

The Chinese appetite for all three kinds of quality emitter is very healthy indeed. Ceramicx quartz elements for example, continue to see significant technical development in China.

Material heating test system of aircraft cockpits fitted with FQE elements

Over the past 18 months or so Ceramicx has been asked to manufacture many custom ranges; small, long, wide, curved products.

Ceramicx founder and director Frank Wilson says that 'a lot of our customers, Chinese users included, 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.

Our ability to be able to go from design to dispatch, regardless of global location and distance, is really fast. We build everything ourselves in-house and thus have much more control over the factors within the lead time. Again, these design and build factors are very much appreciated in China.'

GSAE not only covers the sale of infrared elements, its expertise extends to oven design and assembly, retrofitting of IR heating systems. Mr Xu Shan notes that 'we also provide infrared application inquiries and test services in China. We have served Chinese and South-east Asian markets for many years and are involved in many industries such as auto manufacture, plastic packaging, thermoforming, stretch film, paint curing, composite material, solar, and electronic glass.'

Mr Xu Shan adds that 'the concept of Salaimi service is: providing the customer with design advice and with the whole infrared heating solution.

The team is already working together for many years; the main persons of the team all have the project design and application experience of infrared heating. We provide Ceramicx goods and service to hundreds of Chinese companies and our customers are all the leaders in their respective industries.

Via this strategy,' adds Mr Xu Shan, 'we have built up a wealth of IR heating experience and abilities in resolving many kinds of heating challenges – to the great approval of our customers. Longer term, we intend to further serve more Chinese customers with enhanced professional knowledge; thereby making infrared heat, the most efficient and green technology and the most widely used in China.

'When it comes to China,' says Frank Wilson, 'there can be no substitute for 'feet on the street' and Ceramicx is happy to step up to that role. Chinese industry continues to look for ways to improve its thermoforming efficiency and to purchase new products for reducing costs for thermoforming. This dovetails perfectly with our ambition at Ceramicx; the Chinaplas show is a perfect place for business to take place and GSAE is the perfect partner to grow our Chinese market with.'

gsae
广州萨莱米自动化设备有限公司

Future factories - partnering with Siemens

By Cáthál Wilson

In recent months Ceramicx has had the good fortune to be working closely with global electronics giant Siemens. One recent outcome was a fact-finding mission to the latter's Manchester based factory of the future.

The upcoming impact of Industry 4.0 and connected, intelligent factories cannot be underestimated. At a personal level I am delighted to be representing my own perspective on Ireland's Steering Committee for 'Digitalisation of the Manufacturing Sector and Policy Implications for Ireland'.

The end of May saw Ceramicx visiting Siemens in the North West of the UK, discussing common ground and the likely shape of advanced manufacturing to come.

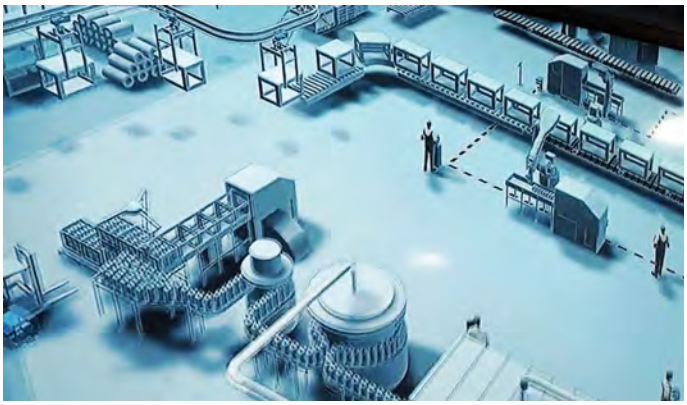
The UK's North West seems to be something of a hot spot for Ceramicx: For me it recalls the ground breaking work we conducted jointly with Linpac Packaging at the company's St Helens plant; a journey that took Ceramicx to the finals of the Plastics Industry Awards, held in London last September.

In this instance the May 24th trip took us to the Manchester area. It involved Ceramicx founder and director, Frank Wilson, Tadhg Whooley, Liam Maddock and I. The technical sessions at Siemens were more than enlightening: Our Siemens account manager Wayne Bursey ably handled all arrangements and our hosts showed us the full extent of their technologies, including their outreach and implications for the future of many industries, including process control, automation, power supplies, motion control, powertrain systems and many other facets of modern manufacturing.

Readers in this space will know that our own technological efforts at Ceramicx are also currently gathering pace. Shop floor Automation; Product Thumbprints and Birth Certificates; The Circle project (Using big data in product validation and testing), SolidWorks, The Herschel, our new factory build with laboratories and white rooms, SAP installation – all of these elements at Ceramicx are pieces of the evolving production jigsaw now coming together at our company and many others throughout the world.

From that perspective the timing of our Siemens visit could not have been better; boosting our enthusiasm and commitment to the various tasks at hand.

Industry 4.0 means integration and connectivity (the effective deployment of the Internet) - knitting all these elements together.



Further Ceramicx 4.0 related activities are as follows…

Robots – Staged Introduction of Collaborative Robots

Big Data – The Use of Big Data Processing to Improve the Manufacturing Process

The Cloud – The use of the Cloud is commonplace across multiple aspects of Industry 4.0.

Simulation – Researching the use of Simulation through Fortissimo an FP7 Project in Which Ceramicx is a Case Study Partner soon to be extended to Horizon 2020.

System/Process Integration – Integrating processes on an ongoing basis which basically means simplifying them as much as possible through the exploitation of available technologies.

Additive Manufacturing (AM) – We are part of a consortium that under the Fraunhofer in Germany won a project to 3D print Ceramics. This project is CerAMfacturing and the case study for Ceramicx is the 3D printing of Ceramic Infrared Heaters.

Industry 4.0 of course has a variety of interpretations and interpreters. Our Siemens hosts put the implications in this particular nutshell:

'The seamless integration of data along the industrial value chains will gain more and more in importance, becoming a

key criterion for the survival of developing / manufacturing companies.'

Let's not forget the customer, in whose name all of this development will take place.

To truly deliver, the evolution of Industry 4.0 – the complete business story - has to also embrace the various worlds of the customer – together with associated new horizons in sales marketing (digital and traditional) in data management and in deployment of Customer Relationship Management (CRM) systems.

Guesswork, black arts, and – to some extent – craft are quickly disappearing from manufacturing. Product design and manufacture – cradle to cradle - can now be more or less completely realised in virtual space. More than anything, the Siemens visit has made that element plain as day.

The visit also showed us that the complete digital representation of the entire physical value chain is within reach. Powerful Product Lifecycle Management (PLM) software, now allows Siemens to develop and optimize new products on an entirely virtual basis. And in the real manufacturing world the Totally Integrated Automation (TIA) concept has been proving its worth for about 20 years - ensuring the efficient interoperability of all automation components.

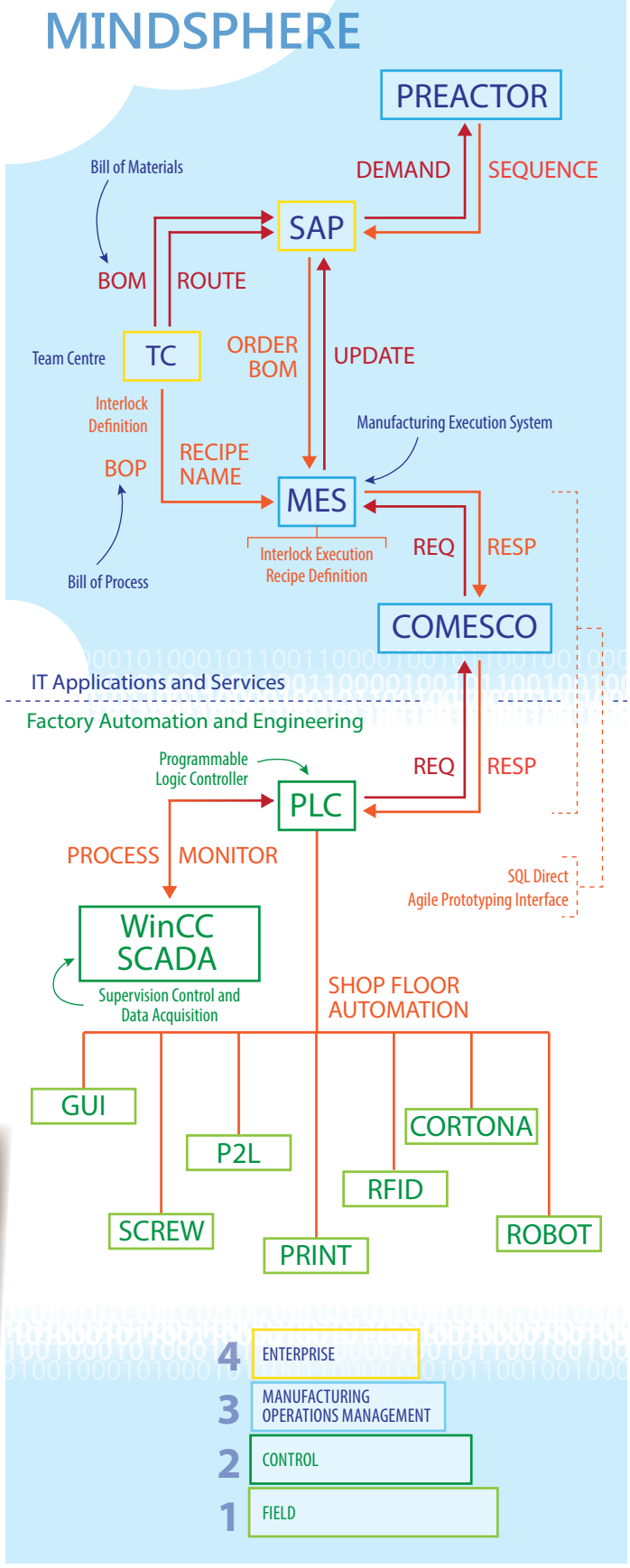
In short, Ceramicx is delighted to find ourselves on the same page with our global engineering and technology supplier and associate. For some time now Ceramicx has been preparing for such a relationship.

Let's be clear: Industry 4.0 investment will not be appropriate or achievable for every enterprise. All potential improvements must be approached with caution in order to ensure that automation is carried out for return on investment not simply for its own sake.

We are confident that our developing relationship with Siemens and its solutions will certainly help catalyse our own process further. We look forward to bringing our readers news of future developments.

Tadhg Whooley, Liam Maddock, Frank Wilson, Ian Wells (Siemens), Wayne Bursey (Siemens) and Cáthál Wilson

Model of software systems in an industry 4.0 plant



Ireland – R&D Central

Leading-edge manufacturing throughout Ireland is advancing in leaps and bounds. Ceramicx is playing a full part in many nationwide initiatives. Dr Cáthál Wilson reports.

As we noted back at the end of March - the taking part in a competitive venture is most definitely worthwhile – but the winning has a special character all of its own.

Earlier this year Trinity College Dublin (TCD) and Ceramicx Ireland Ltd won the nation's Collaborative Research Impact Award under the prestigious Knowledge Transfer Ireland (KTI) initiative.

Professor Tony Robinson, (Mechanical and Manufacturing Eng) Trinity College Dublin, Dr Cáthál Wilson, Director Ceramicx, Adjunct Assistant Professor, Trinity College Dublin.

This category presented a very tough field with competition from global companies. Congratulations to Intel Ireland, Microsoft Ireland, Croke Park, C&F Group, DCU and Dublin Institute of Technology for being short listed against Ceramicx.

The winning result can only deepen our ongoing and successful partnership with TCD and will also embolden us to carry on developing our company, Ceramicx, with fundamental and ground- breaking research into the nature of Infrared heating and Infrared science.

The Herschel machine test instrument that we developed and launched in Düsseldorf Germany in October 2013 now contributes on a daily basis to the company's growing IP - directly and indirectly; bespoke for client work or right at the heart of our own R&D and project work.

In the same spirit we have high hopes for our latest oven machine design for the composites industry – The Vector. Research and development never stand still and Ceramicx continues to nurture its relationships with academe throughout the world.

The creativity, insights and commitment of TCD were critical in bridging the gap between scientific thinking and applications and the current needs of industry.

Some time ago Ceramicx was unique in Ireland in securing funding for a 4th knowledge transfer partnership. We have now put pen to paper for our 5th such tranche of funding. Once again we are working with Dr Garret O'Donnell and the advanced mechanical engineering team at TCD. Not only will the forthcoming work enhance our abilities in automated quality assurance it will also increase our capabilities with regard to Industry 4.0 and Big Data.

Another initiative that Ceramicx helped was the ICMR (Irish Centre for Manufacturing Research). Ceramicx founder and managing director Frank Wilson helped launch the nationwide initiative some six years ago – contributing the SME manufacturing perspective to the launch event and hosting a number of the pilot project meetings.

The ICMR was recently re-launched as Irish Manufacturing Research (IMR) and I was delighted to represent Ceramicx at the launch event.

The IMR is Ireland's first independent and industry-driven, research and technology organisation. The IMR specialises in Advanced Manufacturing Technologies and its 40 new staff will take up high-tech research roles in the areas of Industry 4.0, Collaborative Robotics, Industrial IoT, Data Analytics, Energy Efficiency, Additive Manufacturing/3D printing, Design Thinking and Knowledge Management. All positions will be based in Dublin West.

Minister Frances Fitzgerald, Tánaiste and Minister for Justice and Equality and Minister Mary Mitchell O'Connor, Minister for Jobs Enterprise and Innovation were both present to officially open the Centre.

The Centre's mission is to carry out cutting edge Research, Development and Innovation in close collaboration with

Dr. Will Barton, Chairman IMR., Minister Mary Mitchell O'Connor, Minister for Enterprise, Trade and Employment., Dr. Andrew Lynch, CINO, IMR., Tánaiste Frances Fitzgerald, Minister for Justice., Mr Micheal Cassidy, CTO, IMR., Mr. Barry Kennedy, CEO, IMR. At the time of IMR opening.

manufacturing companies such as Ceramicx in order to ensure industry in Ireland can become, and remain, world-class leaders in their field. The Centre also brings together over 100 indigenous and multinational manufacturers to share the challenges and opportunities in next generation manufacturing.

An initial investment of €15 million under the Enterprise-Ireland and IDA Technology Centre programme is being scaled up through significant additional private and public research funding to create an International Centre of Scale for Ireland in Industry driven Applied Manufacturing Research.

It is perhaps a little known fact that manufacturing in Ireland today accounts for 24% of GDP - far in excess of EU averages. The IMR is there to ensure that Irish based manufacturers are ready to deal with future technological and business challenges through a comprehensive portfolio of research, funding opportunities, advanced skills development and networking.

Speaking at the event Tánaiste Frances Fitzgerald TD and now Minister for Jobs, Enterprise and Innovation, said 'I congratulate the centre on the high standard of building offices and interior design - giving a sense of openness, creativity, in a collaborative, business like work-place. I am delighted to announce the 40 hi-tech jobs in the centre, with plans to scale to 200 jobs as investment from industry grows within the centre. She said that 'it is investments like this from IMR that help make the Irish economy strong so that we can support new measures to make Ireland even more attractive to new investment and jobs.

Barry Kennedy, IMR CEO said that 'we are committed to high-tech job growth and creation across the island whilst driving efforts, simultaneously, to secure Ireland's future as the location-of-choice for world-leading, Advanced Manufacturing industries.

Ireland provides an environment where industry can showcase what a modern technologically advanced, highly skilled, exciting, workforce will look like both now and into the future. It also puts manufacturing in pride of place within Ireland.'

Ceramicx for one fully endorses Barry's viewpoint. From a personal point of view I welcome all opportunities to get involved with the Government/manufacturing interface and to discuss technology futures at the highest level.

In recent months, for example, I have been very impressed with the methodology and the outcomes of the UK's process in this regard. Thanks to Ceramicx UK and our corporate membership of a number of UK-based trade associations, Ceramicx is now very well appraised of the various UK 'Catapult' centres that have resulted from systematic and sustained industry/government collaboration – in advanced manufacturing, aerospace, medical and healthcare technology, information technology and in many other sunrise industries that have been identified for growth.

Dare I say it but – head for head and Euro for Euro – Ireland now has the opportunity and the scope to do even better. Naturally Ceramicx will be pressing the case for greater awareness and take up of the science of infrared heating throughout industry and commerce – both at home and abroad.

This year's prize of the Knowledge Transfer Impact award for our IR testing work with Trinity College Dublin will certainly help our cause. We look forward to reporting further on advanced manufacturing in Ireland in future issues of HeatWorks magazine.

Ceramicx Turkey – a rising star

Ceramicx Turkey launched on the 25th of March 2015 and is now over two years old. Hasan Duman, Ceramicx Turkey Manager, explains how the business is forging ahead.

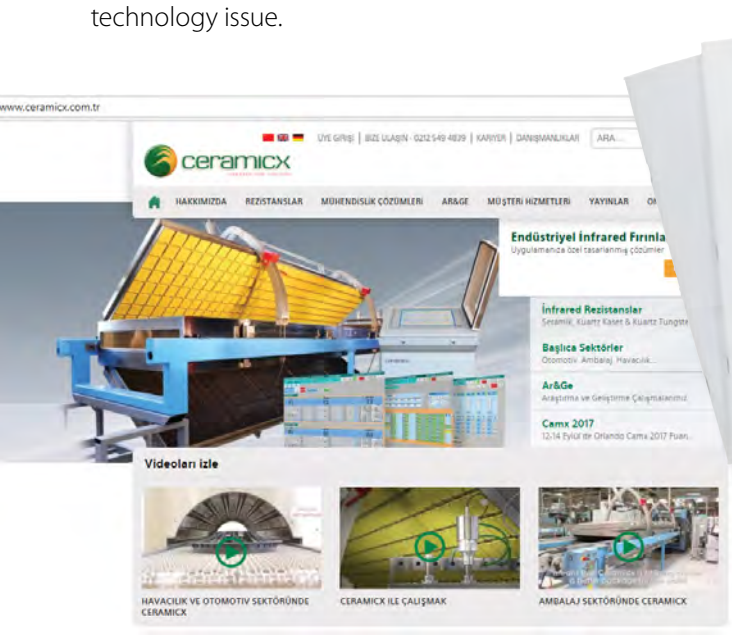
Mr Hasan Duman, General Manager of Ceramicx Turkey

This financial year our company achieved growth of over 65%. This statistic is all the more impressive when we consider that new business is responsible for nearly all of the growth. How has this happened? I would like to take a little time to explain to HeatWorks readers exactly what's behind our story of expansion.

First, we exercise a great deal of patience and spend a good deal of time understanding what our customers actually need. It's easy to pay lip service to the idea of customer service but much harder to do the job thoroughly.

The truth is that each company has their own story, culture and way of working. In order to understand this better I make a point to make deliveries to customers in person.

This approach gives me further opportunity to assess and analyse their real needs. I find myself trouble shooting electronics or PLC components, another time the matter might involve cabling, reflectors or some other Infrared heat technology issue.



As distributors and sellers we need to know as much as possible about the operating environment of our customers and how to help them do an even better job with Ceramicx Infrared heating components. Without keeping in touch with the production environment of the customer – without knowing its everyday issues and problems - it can be very easy to lose direction.

One of our first breakthroughs in this regard came with the ground breaking and painstaking work done by Ceramicx on thermocouple technology – an issue that can be very problematic in heat processing work – too much electrical noise, with no optical decoupling leading to not enough signal accuracy.

Ceramicx addressed these thermocouple issues head-on; developing the company's new NG Cerix type thermocouples which perform at high temperatures, regardless of an optical decoupling capability in the card.

As a consequence, Ceramicx Turkey is now head and shoulders above any other brand of thermocouple in this market. However, merely stating these performance facts is not enough to get the job done. These facts need to be explained and demonstrated to customers one by one.

For example, I personally have a NG Cerix demonstration video setup at 750ºC and I keep it on my phone in my pocket for day to day use. If a potential customer should query the facts – i.e. that there are noise problems at high temperatures I simply show them our videos. If they need to see the practical

proof themselves on a trial basis – no problem. If customers should ask for others to third party validate the technology – no problem.

One recent customer asked that its automation company should validate and compare our products with competitors. The answer was of course yes. The results, have surpassed expectation and the news has travelled fast to the rest of the industry in Turkey.

As the English phrase goes 'the tide has now turned' in the marketplace. The Ceramicx reputation is such that my customers are now supporting me with word of mouth recommendations and by demonstrating our products to further customers.

Ceramicx quality and technical superiority together with IR heating know-how has now created an unbeatable mix within the Turkish marketplace.

From the beginning Ceramicx Turkey always aimed to bring the superior quality into the market place. At the start of our venture this created some initial costs, but as a long-term strategy the principles have worked perfectly.

Ceramicx Turkey chooses to have relationships with thermoforming machinery producers in order to take a strategic approach to the market and to directly address their needs.

One by one we have visited with each machinery producer, talking through PLC issues, cabling and oven design, examining and explaining the pros and cons for various operating systems and seeing how we can improve their IR ovens with Ceramicx knowledge and Ceramicx products.

Ceramicx has also helped with the IR oven design. Cemaks Machinery, for instance, provides a leading example of this process. All credit is due to Mr Bülent of Cemaks with whom we forged our relationship at the K 2016 exhibition and who trusted us to help provide IR heat solutions thereafter.

Cemak Machinery has always aimed to build a very good quality and efficient machine. With our design help, this company was the very first user of Black Square Hollow elements as well as aluminised reflectors.

Thanks to the open-mindedness of the owner, Cemak gained more than 30% energy efficiency with its new Ceramicx based heating systems. This was exactly the result that Cemaks and their customers were looking for.

And within a short space of time Cemaks thermoforming users and customers were inviting us in to see how they could improve their ageing machinery ovens in order to achieve these new efficiency levels.

Ceramicx Turkey has ambitious future plans for the Turkish marketplace. The past two years have seen us establish some very good foundations and now is the time to build some more. We are recruiting design engineers to help Turkish Industry take full advantage of the benefits of IR heat work solutions. There's no doubt that the Turkish and Middle Eastern marketplace is growing.

Mr Kenan Gulen is the first design engineer to start work with us, undertaking projects such as a testing oven design and some IR oven retrofits. The quality of Istanbul-based engineering graduates is second to none and we hope to share our design abilities with Ceramicx. Together we intend to make inroads into Turkey's industrial base and also beyond - to a number of significant Middle Eastern markets.

8kW bench top test unit with interchangeable infrared heating platens consisting of Ceramic, Quartz and Quartz Tungsten/Halogen Tubes. Ceramicx Turkey uses the test oven to help determine the best emitter for a given material or job

Further achievements this year include the establishment of an online Ceramicx Turkey shop; the translation and printing of the Ceramicx Product Guide in Turkish, the manufacture, delivery and commissioning of a special composite fibre IR heating system to a Turkish customer and fresh investment in various IT and telecoms systems in order to help us further enable our international business.

In summary, we are very pleased with the performance thus far. A customer-centered approach has been the key. News of Ceramicx, its cost-effective and reduced-energy ovens and platens has clearly reached the ears of Turkey's engineering communities. That news is now translating into sales orders and expansion. Long may it continue!

Driving through IR heat work solutions

It is typically said that composites comprise of two key elements, most notably the matrix and the reinforcement.

It is a fact that the world's automotive industries continue to drive down production cost and increase user performance. Light-weighted and stronger modern materials are enabling this evolution. Ceramicx expertise in IR heat is contributing to these new manufacturing processes that are driving change.

IR heat technology has several possible roles to play; in the drying, bonding, and annealing of various automotive materials and components, and in the production of various automotive parts and structures.

Ceramicx provides IR drying, curing, adhesive and bonding solutions for automotive companies in all major materials – plastics, glass and metal.

Increasingly Ceramicx also designs and builds IR ovens – drape forming or thermoforming - for production of larger automotive parts

Ceramicx customers in the United States, for example, continue to lead the way in terms of applications engineering. Considerable ingenuity is often required to bring the pieces of a modern automotive car together. Techniques of welding, annealing, shaping and heat forming can all play their part – from the construction of the humblest hatchback to the top of the line luxury car.

Ceramicx is now supplying a leading automotive marque with bespoke IR heat systems in order to bond leatherette materials to the interiors of automotive passenger doors.

The process involves the heating of already formed parts, with quartz tungsten tubes. There are 8 platens in total which all fit onto one machine as required. The heaters face in both directions, up and down. The construction is made from aluminium profile with custom made stainless steel brackets holding custom shape and size heaters in place.

One frame has two banks of heaters, on the lower face of the frame there are straight tungsten heater for heating of the leatherette fabric. The upper heaters are custom shaped heaters to exactly match the surface shape of the part being heated. One control panel has also been supplied for all eight heater platens. The heaters are plugged into the panel as required and the HMI displays the correct platen and required information from the PLC program.

During operation the heater bank is rolled into place; the control panel switches the heaters on until the installed pyrometers reach the set point. At this stage the heaters are removed and the part and the pre-heated leatherette fabric are pressed together. This process is repeated for as many parts as required before changing over to another part and heater platen and repeat.

This recent order – for the demanding US market – represents one part of the automotive sector's increasing demand for Ceramicx IR heat systems. On May 11th of this year Ceramicx presented some IR heating fundamentals at the Warwick

Manufacturing Group, UK in the company of Nissan, JLR and others supplying composite material parts to the automotive industry in the UK.

Speakers included Ford Motor Company, Jaguar Land Rover, Chomarat Textile Industries, Engel. Foseco International, Frimo, Mitsubishi Chemical Carbon Fiber and Composites GmbH, SHAPE Machining and WMG.

Shanta Desai, Nissan's Composites Development Lead, presented and discussed the challenges for composite materials in the high-volume automotive manufacturing industry. The Summer 2017 launch of the all new Nissan Qashqai - from the company's Sunderland UK plant - provided many interesting talking points.

The WMG May '17 event illustrated that the appetite of today's car industry for process ingenuity remains as strong as ever. For example, our presentation of the Ceramicx Vector project – an out of autoclave infrared oven – was very well received by the automotive audience at Warwick on May 11th.

In fact the Warwick Manufacturing Group provided no better setting for this material and for Ceramicx. WMG has long standing expertise in the areas of plastics and automotive manufacturing and closely associated with the growing success that is Jaguar Land Rover (JLR) and with many other automotive OEMs.

The need for affordable composite solutions in sectors such as automotive and aerospace is clear and evident – and becoming urgent. Opportunities for glass fibre and carbon fibre based composites are increasingly becoming part of a shared understanding will be shared and will help companies plan for potential future demand.

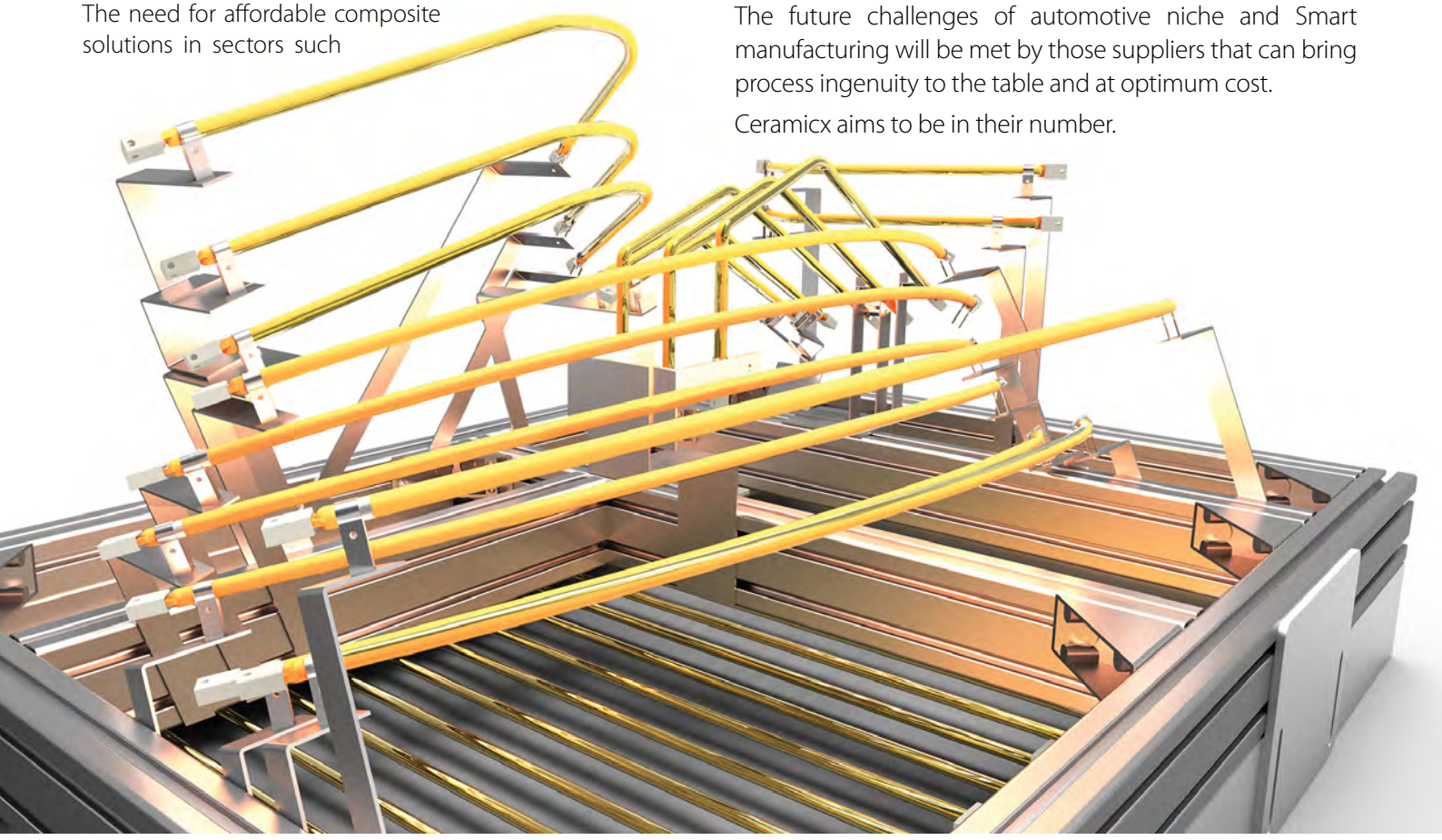
Mention it quietly but in truth, metals are no longer king in automotive build. Once upon a time – and not so long ago - it was considered anathema, for example, in any applied engineering course to discuss anything but metals and metal technology in the context of the automotive industry. Cultural habits often die hard but now I think that it is safe to say that a corner has been turned.

Ceramicx can now confirm this cultural shift from both sides of the Atlantic. We are currently supplying IR heating machine cells for the USA - manufacturing automotive components that will make a light weighted difference to all the OEM manufacturers there.

Light weighting – stronger and lighter components and body build – is here to stay, not only in automotive but in all transportation. Simply put, demand exceeds supply and there can be no way back for all manner of composite material and components.

The future challenges of automotive niche and Smart manufacturing will be met by those suppliers that can bring process ingenuity to the table and at optimum cost.

Ceramicx aims to be in their number.



Ceramicx's Machining Shop

We make it here - Extensive rebuilding work at Ceramicx is proceeding hand-in-hand with significant investment in machine tools, hardware and software.

Readers will know that our Ceramicx manufacturing site is undergoing a programme of complete renovation and rebuild. Things are progressing very well. The new machine-building hall, for example, is taking on great shape and is well ahead of schedule.

Nothing gives me greater pleasure than to witness some of the new production technology that is now enabling us to produce multiple orders in parallel for all corners of the world.

A brand new 3 tonne gantry crane is being effectively deployed in the new machinery hall. Nothing slows a shop floor down more than an immovable object. Our new crane deals with such matters in seconds - mixing and matching materials and tools for various jobs on the extensive shop floor – a conveyor IR oven for the USA, a thermoforming platen for the UK, custom-built IR heaters for China.

The Ceramicx machining and tooling shop is also playing an increasing role in developing all our products and in building in the superior build quality and extra value that Ceramicx customers enjoy.

Our new Excetek V350G workstation, for example, has now completed nearly a year of valuable service. Its 4 axis abilities complement those of our Hurco-based milling and bar-feed lathing workstations. All of these units are fed from our SolidWorks, CAM and AutoDesk design and software packages and many other pieces of equipment are increasing Ceramicx's abilities in all round metal working. If Ceramicx sees an opportunity to manufacture one part of a system component – we will take it. Accordingly, various metal working capabilities and work stations are at our disposal within the factory walls.

Ceramicx is also making further capital investments in the shape of a new kiln. This will have the capability to process alumina ceramics – an alternative material to our existing steatite production. Both of these materials are primarily used in producing electrical insulating components.

These contract design-and-build manufacturing services – in tooling and steatite and alumina parts - are becoming increasingly popular with customers.

In fact a full manufacturing service for steatite parts is available from Ceramicx. It includes consultancy, design, tooling and the manufacture of specialized steatite ceramic dust press components on the Ceramicx 6 Ton, 15 Ton and 30 Ton Dorst presses. These capabilities are also deployed in making mainstream Ceramicx products.

Ceramicx global commercial expertise and services can be included in the steatite and machining services. The company can ship steatite orders directly to the specifier or to the specifier's customers worldwide. Competitive pricing and terms are offered together with global distribution

Wherever possible my philosophy has always been to source our key value-added manufacturing activities in-house. Not

only does this policy broaden and strengthen the general technical and manufacturing capabilities of Ceramicx, it also removes the vagaries of third party supplier arrangements. Recent months, for example, have seen us develop fresh expertise in the necessary welding and fabrication activities for the production of conveyor ovens – an increasing segment of business.

Naturally we are also seeking to integrate and to digitise all these elements together and so Ceramicx is developing its 3D engineering work, assisted by the SolidWorks design package and its manufacturing adjunct - Inventor HSM.

The SpaceClaim software remains part of the Ceramicx design arsenal but the potential changeover from direct modelling to parametric modelling represents a quantum leap of a different order.

This factor alone allows the history of a design to be visible and altered as suitable, making Ceramicx product designs more robust, less susceptible to error and enabling a more streamlined approach to the manufacturing process.

Manufacturing is also streamlined for us yet again by the combination of SolidWorks and Inventor HSM. This is a further game changer for Ceramicx, since it allows the full integration of subtractive manufacturing methods.

With this combination, cutting tools are selected and paths are calculated by the CAM software rather than being input by the machine operator. The whole design process is speeded up thereby and is made open accessible to the company's entire engineering team as the licensing arrangements are much more flexible.

We pick and choose our machines and our technologies– some esoteric and others less so. Indeed, there's often no harm at all in working with the most popular products and solutions on the markets. SolidWorks was founded in December 1992 and the software is now in its 25th version with well over 1.5 million licences sold worldwide. Inventor HSM gives us seamless manufacturing integration, both in-house and for any contract work we might place.

Throughout the course of our 25-year history Ceramicx has never forgotten that manufacturing excellence begins and ends at home. I believe that a major part of our reputation rests on the fact that Ceramicx makes it all here.

Quartz and Elements

> THE FULL INFRARED HEATING PORTFOLIO

Ceramicx is unique in that it supplies the entire spectrum of IR emitters – short, medium and long wave; ceramic, quartz and tungsten-based. Now – and for the first time – the company has published a fully comprehensive guide to all of its production.

'We felt that such an approach was necessary,' says founder and owner Frank Wilson, 'not only to fully document the entirety of the manufacturing output here at Ceramicx but also to remind our customers and industry-at-large that the world of IR heating is a very broad one. There are always options and IR heating choices available to the Ceramicx customer.'

Section by section the company has documented the main technical features of its manufacturing and has also indicated the main uses or applications for particular products – be these ceramic-based, quartz or tungsten quartz based or the company's latest furnace products.

In recent times Ceramicx has invested heavily in photography, rendering and illustrations of all of its manufacturing and production. 'Wherever we are in the world,' says Wilson, 'we live, work and specify in an increasingly visual culture. Ceramicx has therefore made sure to match all our technical product details and product specifications with as much illustrative material as possible. In this way the customer is fully informed and aware of their purchasing ahead of delivery.

Our new product guide,' says Wilson, 'is therefore principally of use to buyers and users of our infrared heating components and equipment. However, the guide is also useful to stockists, distributors and agents around the world and to readers who wish to gain an understanding of the world of infrared heating.'

Part of the reason that Ceramicx is a World Class producer (audited in the top 2% of its peer group) is its rigorous approach to quality and quality assurance.

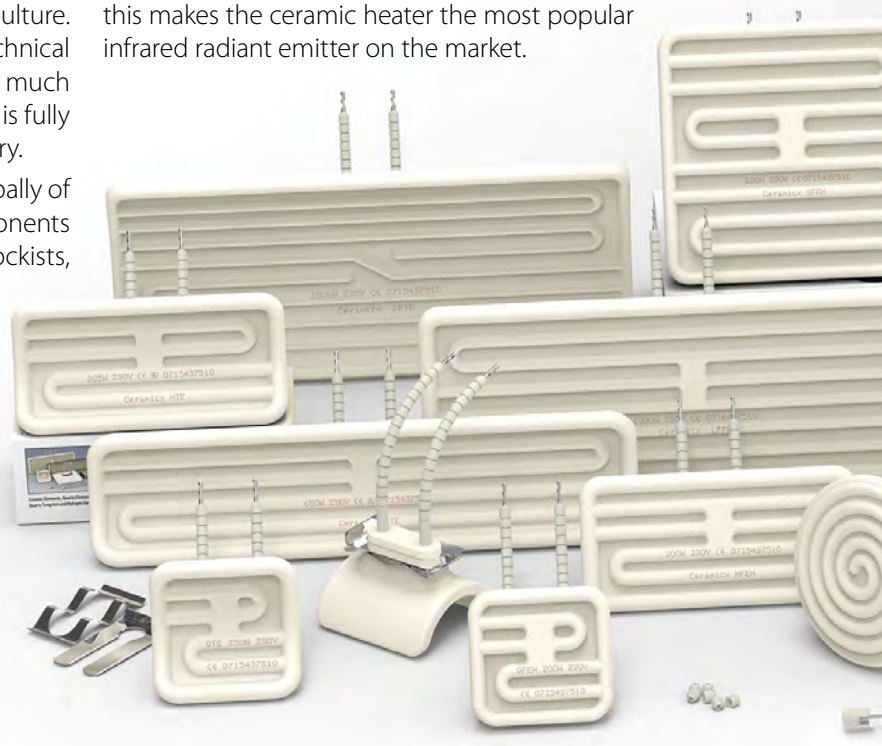
Every ceramic-based heating element made at Ceramicx for example,' says Wilson 'is positively tested and passed fit for purpose as part of the company's semi-automatic quality assurance system. Each ceramic element is shipped to the customer with its own unique technical 'thumbprint', birth certificate and product specification.

In this way, every aspect of the heat performance of that particular ceramic component can be inspected by the customer in that component's unique online data file.

This cataloguing and classification of all ceramic elements is matched with equal rigour by Ceramicx distributors throughout the world. GSAE, the Ceramicx distributor in China, for example (see pages 1-3 this issue) tests and checks every single one of the hundreds of thousands of ceramic-based components that are shipped to it from Ceramicx.

World-class validation laboratories are used for the testing of all ceramic-based products. The growing Ceramicx partnership with Trinity College Dublin (TCD) is increasingly using the resources of Big Data in this process – over time, the capabilities – and therefore usages – of Ceramicx will be set to grow.

Ceramic-based elements typically operate in the temperature of 300°C to 700°C (572°F - 1292°F) and produce infrared wavelengths in the 2 - 10 micron range. Most plastics and many other materials absorb infrared best in this range and this makes the ceramic heater the most popular infrared radiant emitter on the market.



Ceramicx configurations of these include ceramic trough elements, ceramic hollow elements, ceramic flat elements, and ceramic infrared bulbs. The Far Eastern marketplace is also home to several customized ceramic IR products, including 'hollows' and square flat hollow designs.

In response to recent customer demand Ceramicx has built a number of spot heaters for industrial users. In these custom built infrared heaters the basic construction consists of a resistance coil embedded into a ceramic fibre board which is then located behind an emitting surface of either anodised aluminium or glass ceramic.

Ceramicx product innovation and redesign is continuous as regards its quartz-based IR heaters; providing medium wave IR radiation and ideal for faster heat response.

Ceramicx quartz-based heaters are particularly effective in systems where rapid heater response and/or zone controlled heating is required. Quartz heaters typically have a broad emission spectrum from around 1.4 to 8 microns.

The steatite and alumina production capacity at Ceramicx plays a key role in the success of quartz-based projects, helping create new components and sub assemblies. Ceramicx has recently innovated in curved quartz heaters and in quartz-based solutions for drying and curing materials.

For fastest performance Ceramicx makes extremely high intensity infrared heaters using quartz tungsten, or quartz halogen. These IR emitters heat up and cool down within seconds, making them particularly suitable for systems requiring short cycle times or in fast moving processes such as the paper and print industries.

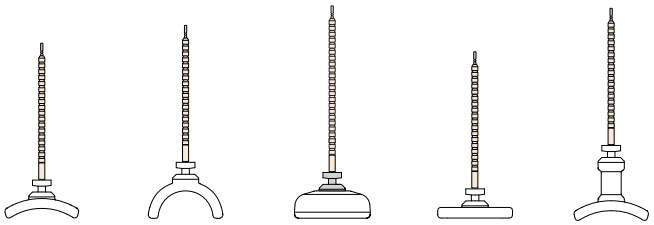
The tungsten filament can be operated at temperatures up to 1500°C (2732°F), with a peak wavelength emission of approximately 1.6 microns. It reaches top temperatures within seconds.

Halogen heaters are filled with a halogen gas to allow the supported tungsten filament to reach temperatures as high as 2600°C (4712°F). Peak emissions for these tubes is around 1 micron.

'For anyone in manufacturing our product guide is a useful reference work, running to 60 A4 pages and doing much to explain the purpose, principles and functionality of IR heating,' says Wilson. 'I recommend that you contact us directly for your free hard copy – or browse it online here. It will be a key part of the Ceramicx future for time to come.'

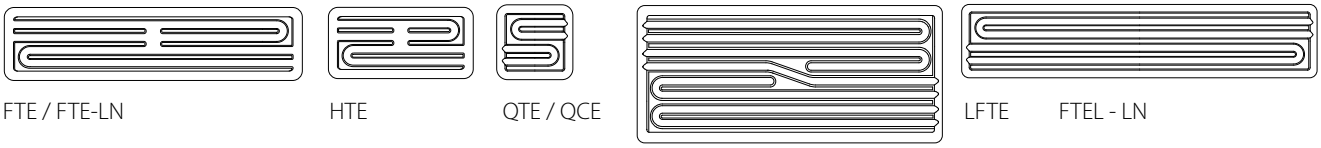
Product Guide

The full product guide can be viewed on line or downloaded from www.ceramicx.com/catalogues1/
or if you would prefer a hard copy, email a request with your details to david.hayward@ceramicx.com.



CERAMIC TROUGH ELEMENTS

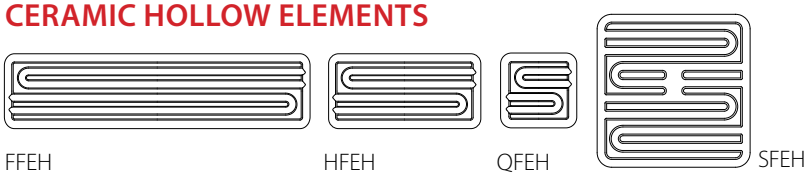
www.ceramicx.com/trough-elements/



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

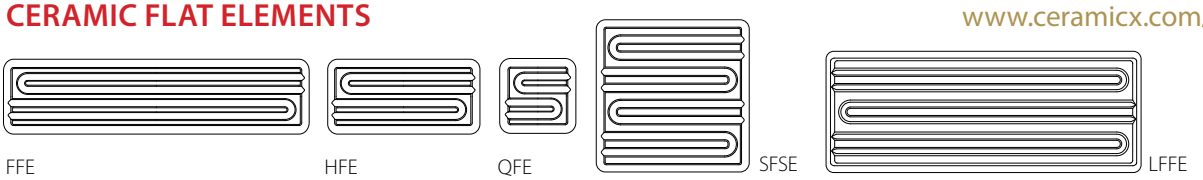
www.ceramicx.com/hollow-elements/



FFEH 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

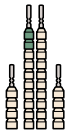
www.ceramicx.com/flat-elements/



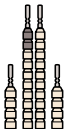
FFE Full Flat Element	245 x 60 mm	150W 250W 300W 400W 500W 650W 750W 1000W
HFE Half Flat Element	122 x 60 mm	125W 150W 200W 250W 325W 500W
QFE Quarter Flat Element	60 x 60 mm	125W 250W
SFSE Square Flat Solid Element	122 x 122 mm	150W 250W 300W 400W 500W 650W 750W
LFFE Large Full Flat Element	245 x 95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

THERMOCOUPLES

www.ceramicx.com/thermocouples/



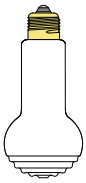
Thermocouple Type K
+ Nickel Chromium
- Nickel Aluminium



Thermocouple Type J
+ Iron
- Copper Nickel

EDISON SCREW ELEMENTS

www.ceramicx.com/ceramic-bulbs/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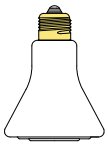
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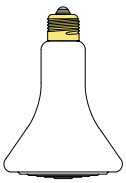
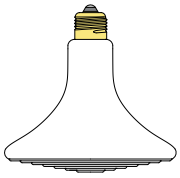
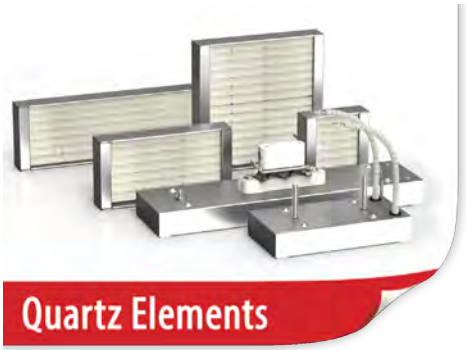
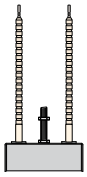
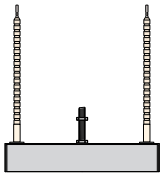

ESER


ESEXL

ESEB Edison Screw Element Ball	Ø65 x 140 mm	60W 100W
ESES Edison Screw Element Small	Ø80 x 110 mm	100W
ESER Edison Screw Element Regular	Ø95 x 140 mm	150W 250W
ESEXL Edison Screw Element Extra Large	Ø140 x 137 mm	400W



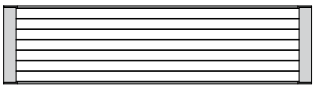

Standard

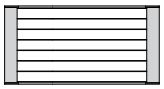

Square


Pillar

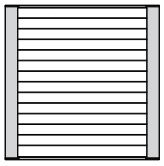
STANDARD QUARTZ ELEMENTS

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


FQE


HQE

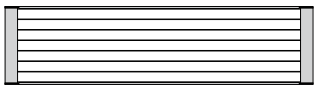

QQE

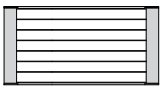

SQE

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/

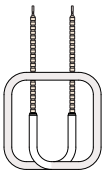

PFQE

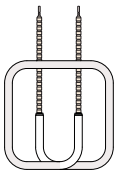

PHQE

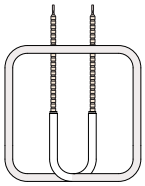
PFQE Pillared Full Quartz Elements	247 x 62.5 mm	150W 250W 400W 500W 650W 750W 1,000W
PHQE Pillared Half Quartz Element	124 x 62.5 mm	150W 250W 400W 500W

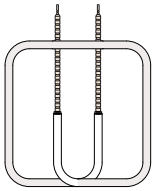
SQUARE QUARTZ TUBE ELEMENTS

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

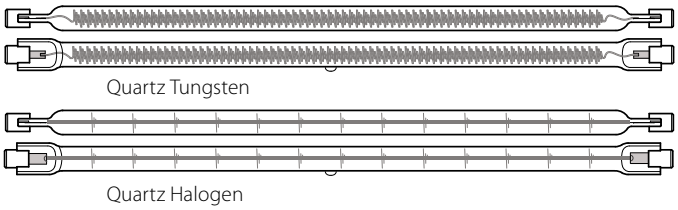

STQH 100


STQH 112


STQH 140

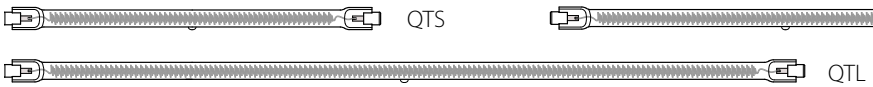

STQH 150

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 TUBES

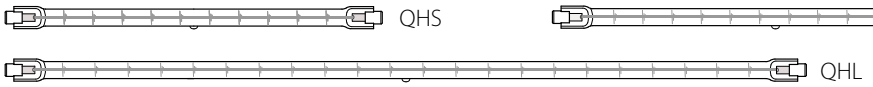
www.ceramicx.com/fast-medium-wave-emitters1/



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/

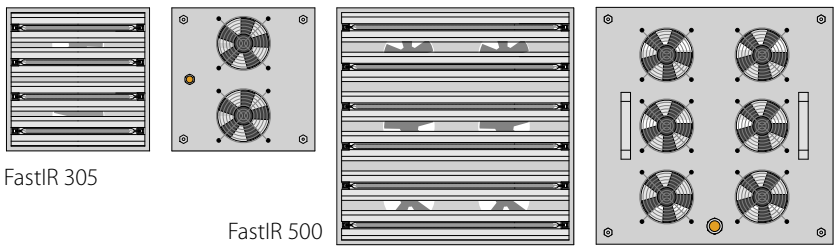


QHS Quartz Halogen Short	Ø10 x 244 mm	750W
QHM Quartz Halogen Medium	Ø10 x 277 mm	1000W
QHL Quartz Halogen Long	Ø10 x 473 mm	1500W 1750W 2000W

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.

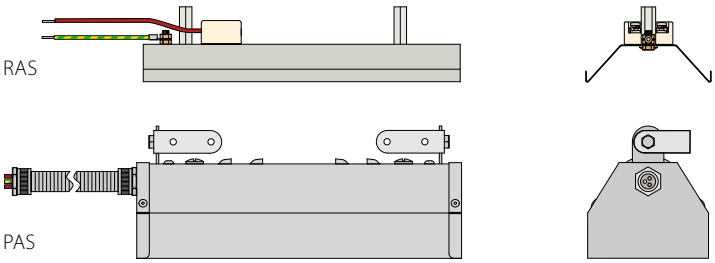


FAST IR

www.ceramicx.com/fastir-systems/

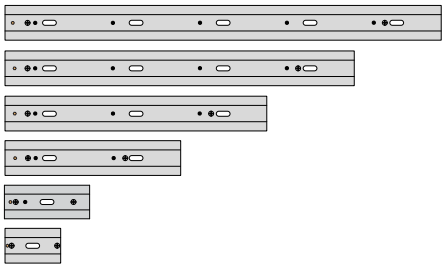
FastIR 305 305 x 305 x 150 mm **4 Tube** 4kW **5 Tube** 5kW
Suitable for 1000W Quartz Tungsten/Halogen Heaters QTM/QTH *(tubes sold separately)*

FastIR 500 500 x 500 x 150 mm **6 Tube** 12kW **7 Tube** 14kW
Suitable for 1000W Quartz Tungsten/Halogen Heaters QTL/QHL *(tubes sold separately)*



REFLECTORS

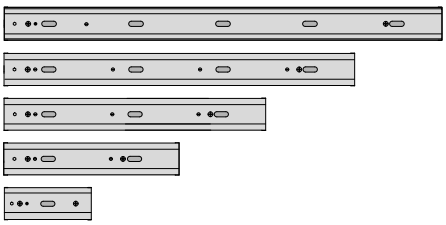
RAS 5	Reflector Aluminised Steel 5	1,254 x 100 mm
RAS 4	Reflector Aluminised Steel 4	1,004 x 100 mm
RAS 3	Reflector Aluminised Steel 3	754 x 100 mm
RAS 2	Reflector Aluminised Steel 2	504 x 100 mm
RAS 1	Reflector Aluminised Steel 1	254 x 100 mm
RAS 0.5	Reflector Aluminised Steel 0.5	160 x 100 mm



PROJECTORS

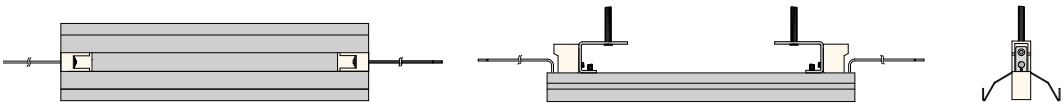
www.ceramicx.com/projectors/

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



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)*

CUSTOM PANEL HEATERS.

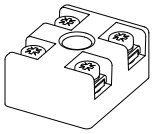
Available with anodised aluminium or ceramic glass face.
Range of Wattages and Voltages.

Anodised aluminium face - Good radiant efficiency, very robust, surface sheet can be easily cleaned or replaced if damaged by molten material.

Glass ceramic face - Very good radiant efficiency, high percentage transmission of radiant output in medium to short wave range, surface can be easily cleaned.

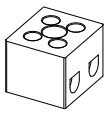
Electrical terminations Open 2P terminal block, Terminal block with cover, M6 or 1/4" threaded stud, Type K thermocouple with fixed high temperature socket and removable plug.

2P Ceramic Terminal Block *



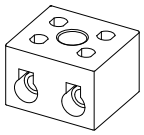
Stainless Steel
Fittings
40 x 32 x 20 mm

2P Mini Ceramic Terminal Block *



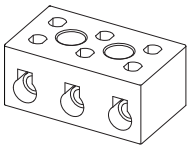
Nickel Galvanised Brass
Inserts, Zinc-plated Steel
Screws
21 x 18 x 15 mm

TB2 Ceramic Terminal Block *



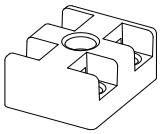
(closed)
Plated Brass Inserts,
Nickel Galvanised
Screws
34 x 30 x 22 mm

TB3 Ceramic Terminal Block *



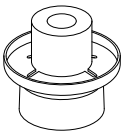
(closed)
Plated Brass Inserts, Nickel
Galvanised Screws
51 x 30 x 22mm.

2P Ceramic Terminal Block *



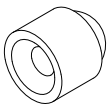
no Fittings
40 x 32 x 20 mm

Ceramic Grommet and Starlock Fastener Set 100 sets



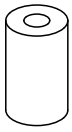
per pack - used as an
Insulator in sheet metal
with 6mm hole
21 x 18 x 15 mm

Ceramic Beads



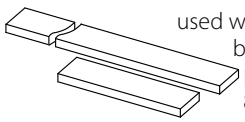
per kg
Loose or Strung
Ø5 x 6 mm
4.5 mm to shoulder

Ceramic Tubes



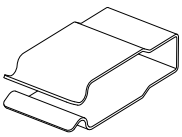
Ø5 x 11 mm

Stainless Steel Buzz Bar



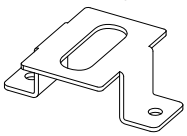
used with the ceramic terminal
block to produce a flexible
power distribution system
8 x 2 x 1000 mm

Flat Ceramic Base Holder



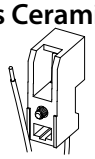
For Halogen/Tungsten
heaters fitted with flat
ceramic base

Mounting Bracket



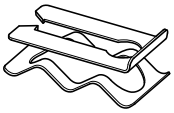
For ceramic elements
72 x 57 x 28 mm.
slot size 42 x 15 mm

R7s Ceramic Holder



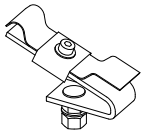
For Standard Quartz
Tungsten/Halogen
Tubes

Steel Wave and Spring set



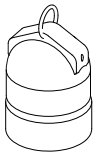
Used in the mounting
and installation of all
Ceramic elements and
the Pillared Quartz
elements

STQH Holder



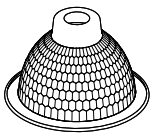
For all types of square
tube Quartz Heaters
(STQH)

E27 Edison Bulb Holder



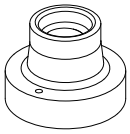
High temperature
porcelain holder used
with ceramic IR bulbs
Ø46 x 64 mm

Ceramic Bulb Reflector



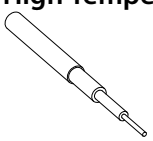
Highly polished
reflector for use
with ceramic IR bulbs
Ø220 x 110 mm

E27 Bulb Holder with Base



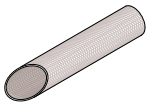
High temperature
porcelain holder used
with ceramic IR bulbs
Ø78 x 60 mm

High Temperature NPC 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

Fibre glass braided sleeving



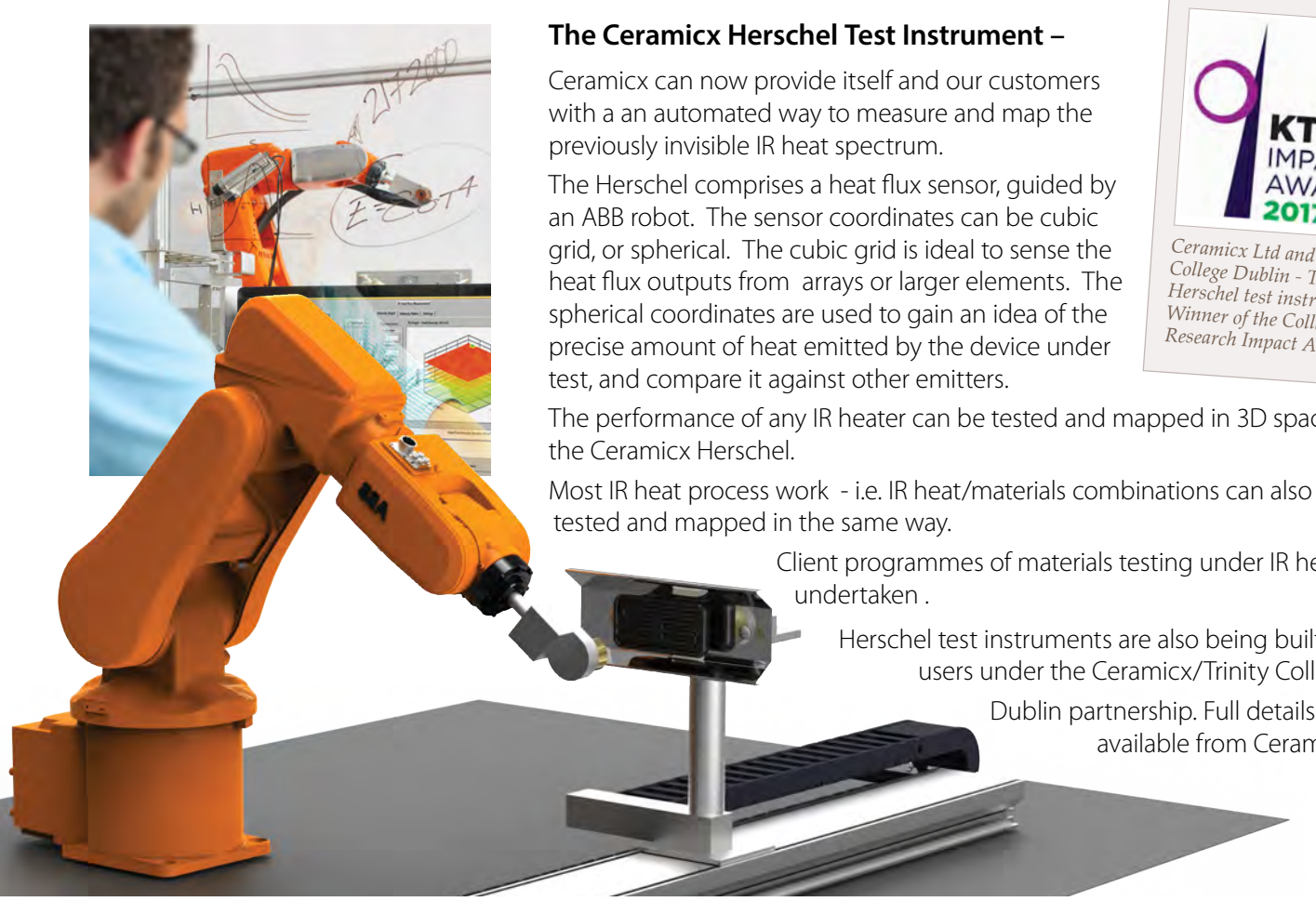
Fibre glass braided sleeving non-impregnated
continued working temperature -60ºC to + 450ºC
Nominal diameter
2mm, 4mm, 6mm

* Sold in units of 10

Research and Development

The Research and Development guide can be viewed on line, downloaded from www.ceramicx.com/catalogues1/ or if you would prefer a hard copy, email a request with your details to david.hayward@ceramicx.com.

CERAMICX RESEARCH AND DEVELOPMENT RESOURCES



The Ceramicx Herschel Test Instrument –

Ceramicx can now provide itself and our customers with a an automated way to measure and map the previously invisible IR heat spectrum.

The Herschel comprises a heat flux sensor, guided by an ABB robot. The sensor coordinates can be cubic grid, or spherical. The cubic grid is ideal to sense the heat flux outputs from arrays or larger elements. The spherical coordinates are used to gain an idea of the precise amount of heat emitted by the device under test, and compare it against other emitters.

Ceramicx Ltd and Trinity College Dublin - The Herschel test instrument. Winner of the Collaborative Research Impact Award

The performance of any IR heater can be tested and mapped in 3D space by the Ceramicx Herschel.

Most IR heat process work - i.e. IR heat/materials combinations can also be tested and mapped in the same way.

Client programmes of materials testing under IR heat are undertaken .

Herschel test instruments are also being built for users under the Ceramicx/Trinity College Dublin partnership. Full details from available from Ceramicx.

RESEARCH AND DEVELOPMENT OVENS

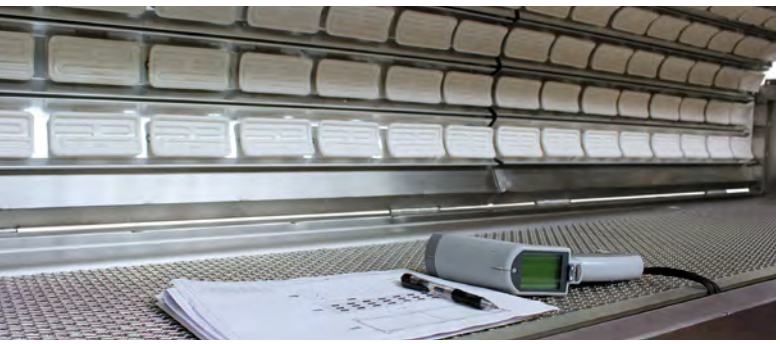
Left, 1.5kW bench top material test unit. Centre, 8kW bench top test unit supplied with 3 interchangeable infrared heating platens consisting of Ceramic, Quartz and Quartz Tungsten/Halogen Tubes.

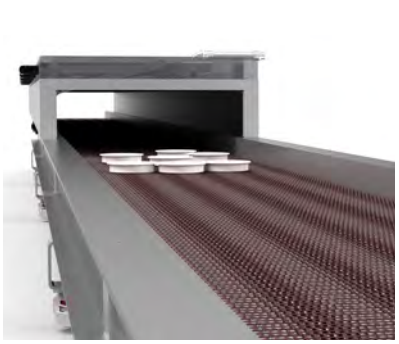
The three pieces of lab test equipment shown are tools for determining the best emitter for a given material or job. All are available from Ceramicx, where the first two should be found in the arsenal of any serious user of infrared heat. The unit on the right was designed and manufactured to suit a customers specific requirement.

Infrared Solutions

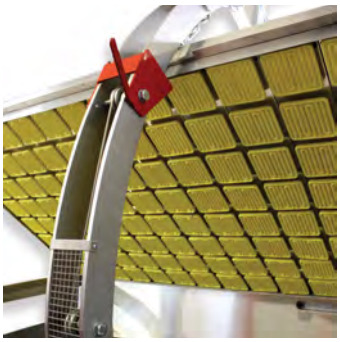
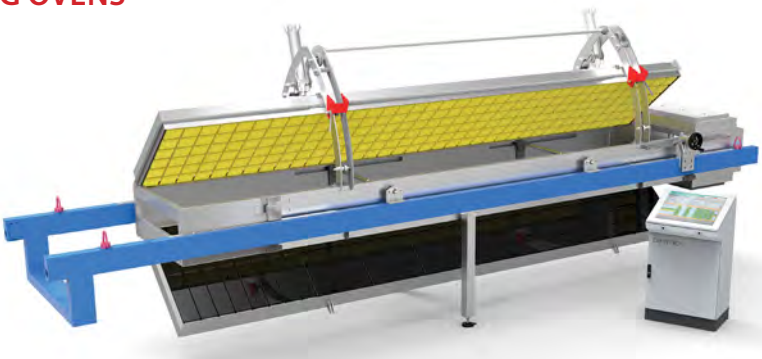
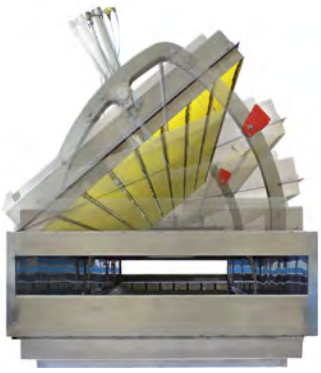
The Ceramicx Industrial ovens and infrared solutions guide can be viewed on line ,downloaded from www.ceramicx.com/catalogues1/ or if you would prefer a hard copy, email a request with your details to david.hayward@ceramicx.com.

CONVEYOR OVENS

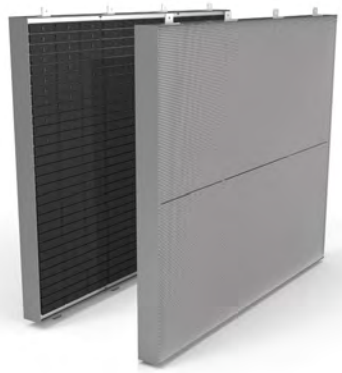




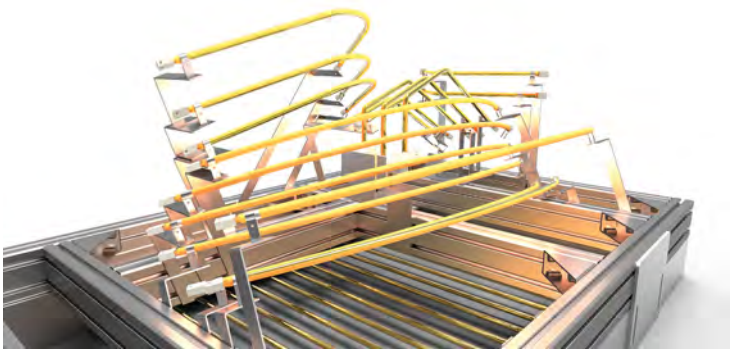
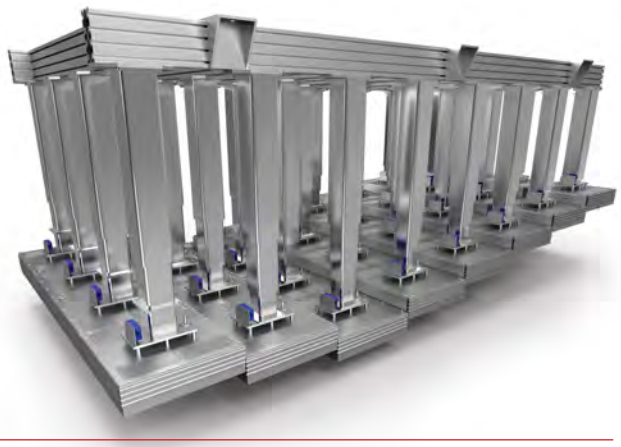
IN LINE THERMOFORMING OVENS

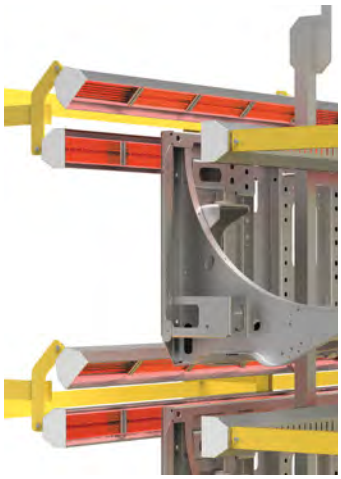
CUT SHEET THERMOFORMING OVENS



COMPOSITE THERMOFORMING OVENS

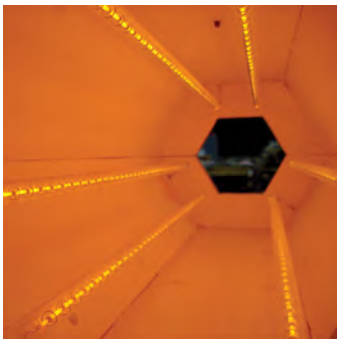



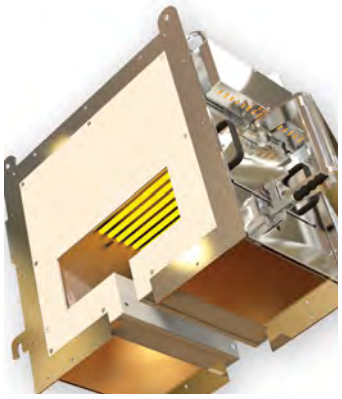
DRYING LINES AND CURING



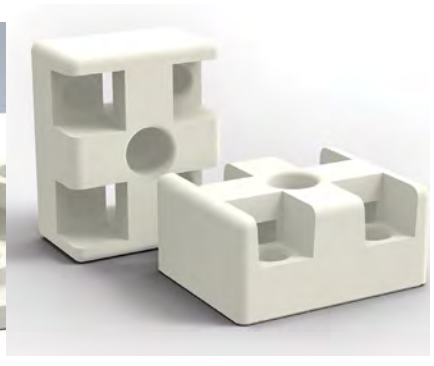
PROCESS WELDING AND ADHESIVES

FURNACE OVENS





STEATITE AND ALUMINA DUST PRESSING



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INDUSTRIAL OVENS AND

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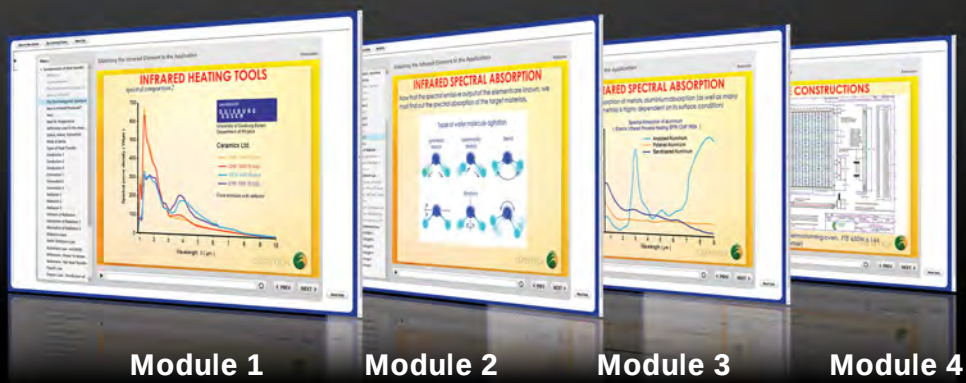

Module 1 Fundamentals of Heat Transfer and Infrared

Module 2 Infrared Energy in Process Heat

Module 3 Matching the Infrared Element to the Application

Module 4 Control of Infrared

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