

The key highlights from the Future of Furnaces event

The first Future of Furnaces event saw more than 140 industry experts join for two days of online discussions, conference sessions and networking opportunities. Zahra Awan* outlines the highlights from the event including: Exclusive coverage, speaker quotes, company insights and more. There was a general consensus from attendees the key to a successful future of furnaces is the community, which must be kept alive.

The Future of Furnaces event, which took place between 14th - 15th September 2021, marked the first of a chain of conferences whereby companies and industry specialists came together from the glass, steel and aluminium industry, to form a collaborative approach towards a successful future for furnaces. The event discussed the latest technical developments, with regards to Industry 4.0 and sustainability-climate targets.

Held in association with Furnaces International, the event ran brilliantly with more than 140 delegates attending and speakers from across the globe joining

discussions on the hopeful future of furnaces, the effects of Brexit and safety standards.

Opening the event was Fabrice Rivet, Environment, Health and Safety Director, FEVE who spoke on 'Securing our Industry's Future: Towards Climate-Neutral Container Glass'. The keynote speaker presented on the glass industry's goal towards carbon neutrality with regards to container glass.

Mr Rivet detailed the use of electricity and the intention of FEVE's members to convert towards technology, which will deliver a greener future. The Furnace for

the Future (F4F) concept was explained during his presentation with its objectives outlined; the concept aims to melt glass with 80% electricity. Concluding his presentation, it was clear that Mr Rivet relied on the "cooperation of all members and companies" for the transition to a lower carbon using industry.

A focus on the importance of Industry 4.0 changes was emphasised throughout the event, starting with Ametek Land's speaker, Neil Simpson, Independent Consultant - Simpson Combustion and Energy Ltd. In his presentation 'Use of In-Furnace Thermal Imaging for 4.0 and



Decarbonisation in Steel, Non-Ferrous and Glass', the importance of a digital industry, regarding Ametek Land Industry 4.0 new thermal imaging technology, was presented as a key element in enabling a successful efficient sustainable production. Mr Simpson explained how with recording and tracking of a furnace, the health, progress, efficiency, and sustainability of production can be enhanced. Explaining and evaluating images provided by the thermal camera, Mr Simpson demonstrated what could be monitored to enable improvements.

René Meuleman, Director of Business Development, CelSian, elaborated on the importance of maintaining the health of furnaces in his presentation, 'Tools that Reduce Energy Demanded by Furnaces While Keeping Quality and Furnace Lifetime Intact'. Mr Meuleman emphasised the importance of data, reiterating the statement "Data is very important... it is key for the development of industries." Providing multiple examples of where data can be used to enhance a process, the importance of data became a point often repeated across all presentations on the first day.

This concept was also supported by Mark Allen, Sales Director, Mechatherm. His presentation was introduced by Business Development Representative, Terri-Ann Bethell who began with the question: "What does the future of furnaces look like?" The company conducted a study, which researched the possibility of 'furnaces being intelligent enough to improve its own performance' using data to produce AI software. The company collected "millions of records" from their furnaces which fed their study. Their intention was to develop software which would be able to "slowly predict



ADRIAN GOODBRAND



ANDREA BAI0



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CLAUDIO GOLDBACH



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FABRICE RIVET



INIGO GUINEA



JONATHAN FARMER



MARK ALLEN



MARK LINDSEY



NEIL SIMPSON



RENE BRANDERS



RENE MEULEMAN

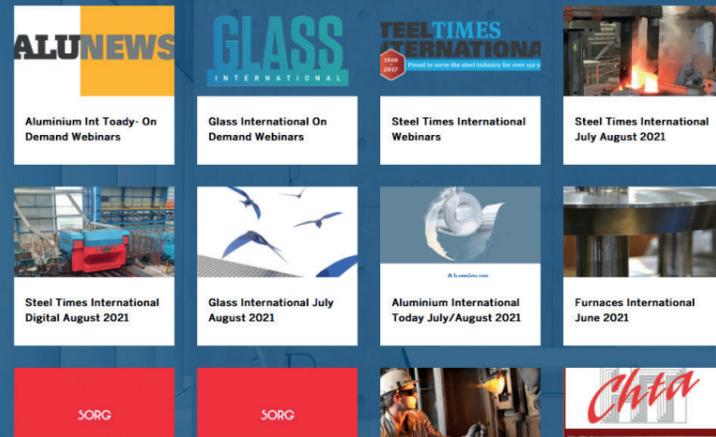


RICHARD HEATH



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what the furnace will do ... the system will purely learn from the furnaces behaviour, how to adapt its performance." Taking Industry 4.0 to a level similar to that of Dr Frankenstein's freak creation, Mr Allen himself commented, "It's alive!"

The conference took a turn to a family business which was formed in 1937, GHI Hornos. CEO, Inigo Guinea, whose focus was on the importance of recycling aluminium, represented the third-generation company. He began his presentation with a series of questions: "Do you know how you will be melting aluminium in the next year, or three years? Do you know what source of energy you will be using in the next five years? Do you know if there is any technology that enables this? Do you know what is available today to help reduce emissions etc?" His points clearly focus on the technology that is needed to enforce the plans and wishes of the manufacturing industry and their customers' demands. The company, Mr Guinea explained, has broken its goals down into three steps, 1. Digitalisation 2. Decarbonisation 3. Recycling. Here, digitalisation leads. To reach the goal of a greener manufacturing industry, one must, in Mr Guinea's words, be "[tech] smart to be profitable," concluding that the key to progression is the development of technology throughout the chain of manufacturing. This is a concept which he similarly preached for with regards to recycling, "recycling has to take place across the entire plant."

Next, speaking on behalf of Inspired Energy, was Dan Hulme, Business Development Manager, who introduced the audience to the "Industrial Fuel Switching Competition" in his presentation 'Net Zero - Future Challenged for Furnace Operators'. The competition is designed to encourage companies to switch to a more sustainable source of energy to replace the traditional fossil fuels to successfully reach the goal of Net Zero. Expected to launch in October 2021, the competition asks for emissions of companies to fall by around two thirds by 2025 and at least 90% by 2050.

As well as AI intelligence and data collection, re-evaluating the format of the furnace was also a theme touched upon.

David D'Aoust, Sales Manager – Drosrite™, PyroGenesis Canada Inc, introduced the audience to plasma furnaces in his presentation 'Plasma Torches: Electric/Zero CO2 Conversion for Fossil Fuel Burners'. Mr D'Aoust stated the commitment PyroGenesis feels towards its responsibility of taking a "huge proportion of the global carbon emission ... is a part of their duty." Taking the 4th state of matter, plasma, PyroGenesis has developed a method of sustainable emission free heating, designed to replace fossil fuel burners. The torches offer 0% combustion as opposed to the hugely polluting traditional fuels.

Following the theme of fuels, Stuart Hakes, Chief Executive, F.I.C. (UK) Limited evaluated the realistic abilities of Hydrogen Fuel, taking its pros and cons into account when considering a long-term solution. Starting off by defining the key differences between multiple sources of Hydrogen, many of which are not sustainable, Mr Hakes delivered a reality check on the supposed 'universal supply' of Hydrogen. "Although it may seem unlimited... it isn't," reminding the audience that nothing in this world is of infinite supply. Mr Hakes also evaluated the safety of Hydrogen concluding it is in fact incredibly dangerous when handled alongside oxygen. Giving explosive examples of Hydrogen and Oxygen – rocket fuel and the Fukushima explosion which was partially a Hydrogen/Oxygen accident, the usability of Hydrogen, the apparent saviour of the industry, becomes much less heroic. Mr Hakes does appreciate that although Hydrogen is not a long-term solution, it does provide us with time to develop alternatives, Hybrid Energy.

The concept of hybrid energy was extended by Dirk Schnurpfeil; Research and Development, Nikolaus SOERG GmbH & Co. KG. SOERG completed a hybrid concept study to compare alongside their 'Vertical Super Melter' a full electric furnace, limited at 200 mt/d, the hybrid furnace became the apparent solution to the issue of energy sources and reaching the ever-extending manufacturing demands. Mr Schnurpfeil evaluated the benefits and realistic goals of a Hybrid horizontal furnace similarly to Mr Hakes, falling in line with his conclusion.

Delegates were provided with an additional on demand presentation held by Claudio Goldbach Chief Executive Officer, Perfil Group. In his presentation, 'Reducing Emissions and Increasing Output in a Continuous Thermal Process using AI', Mr Goldbach discussed the possibilities available when using AI, but highlighted the often-overlooked importance of human intelligence in this matter. During the "CO2 Carbon Credit Programme," where electricity was created from recycling the gasses produced in production, the project used AI to simulate the possibilities available without wasting time on physical models. Using AI, an "equation was used to represent the product." This provided data on real time production. To conclude, Mr Goldbach appreciated the challenges that are overcome when using AI, but he turned towards the importance of human intelligence stating: "Regardless of the technology used, it is mandatory to involve the human being at the centre of the solution from day one... human intelligence before applying AI." Mr Goldbach, perhaps unwittingly, stepped forward against a potential Terminator situation.

The Standards Seminar

The event returned for a second day on the 15th September, which was in collaboration with the British Industrial Furnace Constructors Association (BIFCA). The event hosted The Standards Seminar, which was adapted following the current climate of COVID-19.

Day Two started off with an introduction from the BIFCA Chairman Arthur Watson, who kindly thanked Quartz Business Media for providing a platform for industry leaders and companies to hold a discussion that would otherwise have been held in person.

The event proceeded with its first presentation, which was held by Danny Brennan, Director, DB Gas Associates, who delved into the key discussion of safety regulations 'DSEAR from a Gas Engineers Perspective'. Mr Brennan highlighted the importance of understanding the documents businesses and workers work against, concluding that with an

understanding, the industry can be better in its performance. However, it became apparent that Mr Brennan saw an issue in the regulations and putting them into practice, beginning his presentation with "a lot of this equipment [that had been fitted to pass regulations] was totally unnecessary." He recalled an anecdote of on installation that was "considerably more hazardous after the reviewed fillings were added." Mr Brennan presented the audience with a common issue found across all industries, where paper plans are not necessarily the same as physical practice.

Rene Branders followed, CECOF President, with his presentation 'European and International Furnace Standards', raising the changes presented by Brexit; a theme repeated across the BIFCA seminar. Detailing the changes that often take place across safety measures (whether this is EU regulations or UK), however, a generic trend came to attention. Once again, Industry 4.0 made its appearance at the event as Mr Branders noted that the safety regulations that are written are often driven by the most up-to-date features and technology (Industry 4.0).

Mr Brennan returned to introduce the audience to the regulations of the CE Mark and its replacement UKCA Mark. These were then discussed further in depth by Adrian Goodbrand, Director of Sales, Vacuum Furnace Engineering Ltd in his presentation, 'The Importance of Safety Standards'. Put frankly, Mr Goodbrand explained "safety sells... safety is also the law.... safety is non-negotiable." Covering the updated regulations regarding furnaces, furnaces must, as of January 2021 hold a UKCA Mark if they are manufactured for the UK. Mr Goodbrand noted that to fulfil all the regulations that must be met, use of Industry 4.0 technology can be used to identify it. However, for this to work "safety must begin at the design phase" and must consider human error, which was covered by Richard Heath. Reiterating Claudio Goldbach's point, for AI to be effective, human intelligence is still required to provide the key data needed for it to be effective, as the biggest safety hazard is human error.

Moving on, Jonathan Farmer Sales Director at Duomo, delivered his presentation on 'An Overview of Gas Standards in the UK'. Covering the Institute of Gas Engineers and Managers (IGEM), an institute "here to support individuals and organisation within the gas industry", Mr Farmer explained the institute covers eight series of technical standards. A key standard being safety. In 1960 the IGEM provided companies and specialists with guidance and standards. Mr Farmer

moved onto the new EN746-UP 12, which is being reviewed for implementation in UK standards. However, he concluded that "the path forward is still very uncertain", as it is still very unclear where technology will take safety measures in the future.

Following on from the potential changes to the technology, a reality check was put in place. Human mistake was not overlooked by Richard Heath, Health, Safety and Environment Specialist, the Cast Metals Federation. Mr Heath delivered his presentation on 'Furnace Operations Safety – A User's Perspective', bringing the audience back to mortality. Beginning his presentation - "I am taking on a different area, one where there is plenty of legislation and plenty of product standards, but one where there are lots of gaps. Some of the gaps are often people based and relate to how workers interact with plans and processes. But also, how management interacts with their workers who operate the furnaces." Mr Heath discussed the issues with training, whether it is sufficient and whether it accounts for human error. The most important factor. Disclosing an anecdote on workers who "do the wrong things for the right reason." PPE is presented as a saving grace whilst company standards often lack in understanding the worker. Often workers do what is "right for the company" but in turn, sacrifice their safety.

Danny Brennan returned for his second presentation on 'UK Gas Regulations and the Gas Quality Debate'. Explaining how the UK wishes to expand its gas sources in comparison to European standards following the proposed levels suggested by CEN/TC:

Existing UK
47.20 MJ/m³ to 51.41 MJ/m³

Proposed- CEN/TC
46.44 MJ/m³ to 54.00 MJ/m³

Following a trial conducted testing the proposed limits, the new UK limit was proposed to be:
47.20 MJ/m³ to 53.27 MJ/m³

Following a study testing the CEN/TC limits, although theoretically possible, the effect of increasing limits on gas equipment was taken into consideration as well as usability. "There is a shortage of knowledge on process heating amongst the people who are actually doing the tests." This therefore relates to the usability and safety of increasing limits to a theoretical level, which was proven not possible. As presented by the data above, put in theory, reality is not the same as theoretical. Mr Brennan concluded that the future must be in cooperation with

end users, theories should include the human mind as Mr Goldbach mentioned. Without realistic safety limits, Mr Heath would have the opportunity to choose from several other safety accident anecdotes.

The two-day event was closed with a presentation delivered by Mark Lindsay, Director of Product Approvals UK. The final presentation, 'Market Access of the UK' discussed the effects of Brexit on the safety standards mentioned by Mr Brennan and Mr Farmer. Mr Lindsay outlined the steps that need to be taken following EU changes, detailing the move from the CU Mark to the UKCA Mark. He outlined the differences between the two Marks, which were subtle yet important. The main changes "when Brexit happened [was] the changes to terminology." Small changes, for example: EU Official Body was changed to UK Designed Standards, despite the main body of text being the same, the key terminology changed. The seemingly harmless changes of Brexit became more apparent key elements of unwanted surprises; to understand the documents of safety standards is key to successful safety regulations.

What does the future look like?

The overall message of the event was the emphasis on the community of the manufacturing industry. Despite the current climate of COVID-19 limiting the interaction between companies and individuals on both a professional and personal level, there are still methods of communication available. It is up to us to make use of these and provide a platform which will deliver a better future. As concluded by Mr Branders: "We are together sharing the challenges... together we are stronger, together we are richer with ideas..." ■

For more information on the Future of Furnaces event and detailed listings of the speakers & exhibitors who attended the virtual conference, visit via:
<https://aluminiumtoday.com/furnaces/conference-programme>

For more on the event and updates on the industry, come back to the December issue where exclusive articles will be published from the Future of Furnaces virtual.

With thanks

We would like to thank all of the speakers, exhibitors and delegates who joined us at the Future of Furnaces event. Please let us know any feedback and we hope to be able to host a live version of this event in 2022.