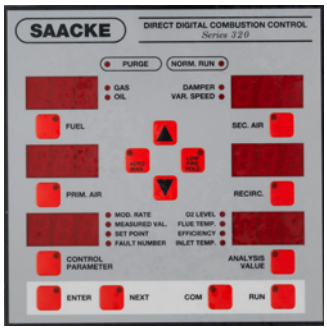
Spotlight Issue 1 – 2021
For owners and operators of heat generating plants in the UK and Ireland

SAACKE
Better Life Energy

Is your plant at risk due to obsolete controls?

If you have combustion equipment that is still operating using the SAACKE DDCCS320 fuel/air ratio controller, we would like to again draw your attention to some very important information. To continue reading, please go to page 3.



What's inside this issue

Hot tips

As we near the end of the first six months of the UK's post-Brexit trade deal with the EU, we note what a steep learning curve this has been. In those first few weeks, our main issue was not being able to obtain the answers where authorities were still working out the agreement rulings. Some logistics companies suspended deliveries to the UK because of the increased paperwork following Brexit.

We worked our way through each situation, gaining valuable knowledge through the Chamber of Commerce and working closely with our logistics partners. We updated our account systems to enable the correct data required for exports and imports to be visible on all documentation. This required input from so many colleagues here at SAACKE. Thank you to all concerned for getting us to where we are today, providing the service our customers expect from us.

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Expert Classes – new format for 2021

Many of you will be aware by now that we have changed the name of our online events from 'Masterclasses' to 'Expert Classes' for 2021 and beyond. Following the success of the straightforward (and pandemic-friendly!) online format in the UK, this is now a SAACKE Group-wide offering and so we have streamlined the name. The sessions continue to provide useful, technical, legislative or customer relevant information, but we now aim to keep the sessions to around 45 minutes plus Q&A. The other difference is that, based on previous feedback, we are now running 2 sessions on each date in 2021 at new times – the first at 11am (fully live) and the second at 2pm (a recording but with a live introduction and live Q&A via the chat facility), instead of only 1 session always at 8am. We hope this will better accommodate potential attendees. Certainly, the feedback we have received so far has been very positive.

The first Expert Class for 2021 took place in March and was entitled 'MCPD – Bringing you up to date'. The event, delivered by Adrian Rowsell, Regional Sales Manager and Phil Kemp, General Manager, was a great success. As well as recapping on the requirements for the Medium Combustion Plant Directive, attendees were brought up-to-date with the latest information and advice.

Medium Combustion Plant Directive (MCPD)
Bringing you up-to-date

"A well-constructed and delivered presentation."

"I found the presentation yesterday very informative and I think I will be joining more in the future."

The second event 'Boiler-house Technical Risk Assessments – your legal obligations' is taking place as we go to print at the end of June and is sure to be another invaluable event. The plan for the rest of the year is as follows:

30th September Alternative fuels/Hydrogen

30th November Increased availability by preventive maintenance/Spares inventory

We will be sharing our decades of expertise!

Invitations to register for our popular Expert Classes, are sent out by email. If you don't receive our emails and would like to, please contact Susie Bell via **s.bell@saacke.com**

Customer comments

"I am very pleased to be able to drop you a line to say how impressed I have been with the recent performance of your spares department. I called Lee 2 weeks ago with a part number on a 25 year old burner. He immediately had the drawings, identified the part (combustion air fan) as not being available and had a price and delivery from the fabricators within the hour. The lead time was brought down from 6-12 weeks, depending, to 2 weeks with an OT shift being put on over the weekend to complete fabrication, at a pre-agreed cost to us. I look forward to taking delivery of the fan tomorrow. Thanks for a great service."

Provided by a major coffee producer in the Midlands

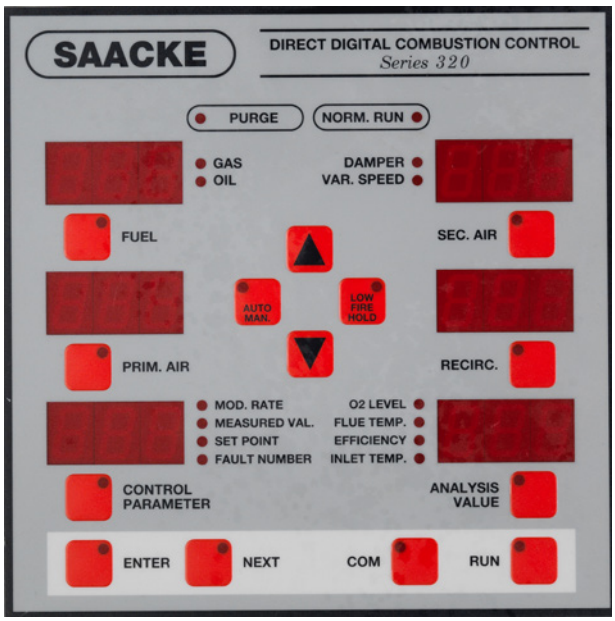
Above: *The damaged combustion air fan*

Thank you so much to all of you who have taken the time to fill in our customer service questionnaires. We really do appreciate it and your feedback helps us to improve. Please keep letting us know how we are doing!

"The service received was fantastic. Conor was meticulous in his work (thorough too). He took time to explain the workings of the current burner setup and will definitely consider SAACKE when renewing our service contract for all our sites."

"Your response to our needs was very good."

Are obsolete burner controls putting YOUR plant at risk?



If you have combustion equipment that is still operating using the SAACKE DDCCS320 fuel/air ratio controller, we would like to draw your attention to the important information below and recommend that you read it carefully. We are also writing directly to affected sites again too.

The DDCCS320 is an electronic based system which was launched in 1995; therefore, it is based on technology that is over 25 years old and that is now obsolete. All customers were notified back in 2017 of the pending obsolescence of this product. We have provided support for as long as possible, however, due to parts no longer being available, we are unable to continue to support this controller.

How many electronic devices do you still use that are 25 years old? This operating time causes its own issues as the unit has finite memory space. During normal operation of the controller, any data input is saved to a memory chip which, once full, will not allow further adjustment and causes the controller to fail. This is the dreaded F50 fault and once this appears, YOUR PLANT WILL SHUTDOWN.

So, what are the other risks? Making any changes to the combustion settings could cause a failure of the system. Without any replacements, this could leave your plant out of action for an extended period. The alternative would be to leave combustion settings well alone, which would mean that your plant could be running inefficiently or in a dangerous state. Inefficient combustion has environmental consequences and will cost you more in fuel. Each percentage of oxygen above the optimum in the flue gases results in a 1% to 1.5% increase in energy consumption.

Can you afford to be without your plant for a number of months? Can you afford to take this risk? Can you afford to be spending more on the operation of your plant?

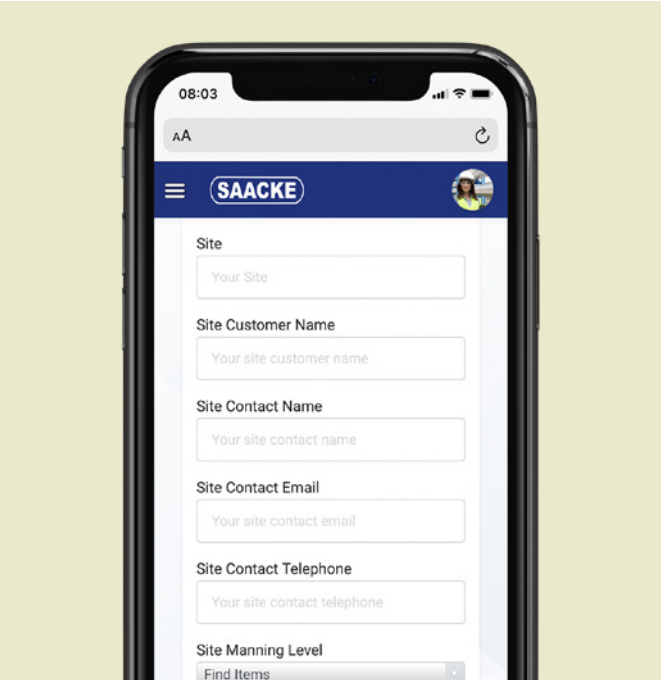
If you don't want to risk the danger of losing your combustion plant, please contact Adam Hartin, Customer Service Solutions Manager via **a.hartin@saacke.com** or **+44 (0) 23 92 333829** to discuss the upgrade paths available. Remember, the choice is yours!

New SAACKE site audit app now launched

The mobile app that has been developed to assist our Service Engineers when attending your site so as to easily identify equipment that may be obsolete, or that we are aware of as going to become obsolete in the near future, is now available and in use.

It only takes around 5 minutes for the Engineer to complete the audit. You will immediately be able to view a report with the equipment highlighted that could have serious implications for your plant. Items in red are obsolete and there is a danger of downtime to the plant unless upgraded, while those in amber are nearing the end of their lifespan.

Our aim is to support you at a level that you have come to expect from SAACKE, ensuring your plant is running reliably and with optimum efficiency.



Efficient use of residual materials:

Heat generation with hydrogen

In the public debate, hydrogen (H_2) has advanced to become the energy carrier of the future, because its potential availability, especially in those industries that are difficult to decarbonise, is enormous. The same also applies to heat supply, although at present it is mainly H_2 from manufacturing processes that is used. A practical example at the specialty chemicals company Nouryon shows which technological hurdles have to be considered: To provide this cost-efficient, safe and low-emission use of the fuel requires specific combustion know-how.

The goal is ambitious: To become a climate-neutral continent by 2050. The production of green hydrogen from renewable energies is expected to increase to one million tons by 2024 and to ten million tons by 2030. The infrastructure for transport and storage is already in place - up to 20% vol. H_2 could be added to the UK natural gas grid in the future and these pipelines could thus be gradually converted. Infact, this figure of up to 20% is being looked at currently by a HyDeploy project hosted at Keele University. Whilst this initiative is a great step forward, to meet the 2050 target, 100% H_2 needs to be looked at. Currently, however, even the capacities permitted up to 10% vol. remain unused because not enough hydrogen is produced. In industrial heat generation, fossil fuels are often even cheaper or biofuels such as wood dust are an alternative. At present in the UK, there are several companies planning to use redundant energy from wind turbines for H_2 generation, meaning the generation of energy from renewable forms will be maximised in the near future increasing utilisation and balancing the mix of the various types of H_2 produced (grey or green) and also reducing the cost of the H_2 production.

The political will for a climate-neutral hydrogen revolution is rapidly gaining momentum. This is because hydrogen is eminently suitable for thermal utilisation: In terms of fuel quality (Wobbe index) it is on a par with natural gas. Its calorific value, which is three times lower, is offset by its significantly lower density. Flame monitoring is also easily possible with existing standard UV flame sensors. However, despite all the potential in the use of H_2 in heating processes, there are also a number of challenges to overcome. As shown below, smart combustion technology can contribute to efficient, safe and comparatively environmentally friendly operation as a piece of the mosaic - and not only as soon as the natural gas pipelines have been converted to hydrogen on a large scale, but also today for very specific applications.

Thermal utilisation of hydrogen as a waste product

The globally active company Nouryon was formed in 2018 from the chemicals division of the AkzoNobel Group and produces chemicals for everyday products. With the help of SAACKE, specialising in thermal processes and plants in the industrial and maritime energy management sector, the company has been converting its processes to H_2 compatibility since the 1990's. This is because hydrogen is also produced as a main and surplus by-product in the chlor-alkali electrolysis process at the European market leader for industrial salt, chlorine trading and chloromethanes. With plant upgrades such as the most recent one in 2019, these existing residual materials can be used as a valuable substitute and fed back to the heat demand of the electrolysis process instead of purchasing costly natural gas as the primary fuel. In this way, the operators - Nouryon operates the electrolysis in a joint venture with Evonik - not only anticipate legal regulations, but also use existing synergies and save 577 m^3 of natural gas (H) per hour.

This is made possible by three hydrogen burners of the SKVGD type, which are based on rotary atomiser technology and are flexibly suitable for liquid and gaseous special fuels. In Ibbenbüren, they are installed with a maximum output of 4.3 to 7.6 MW (depending on the boiler size) on three steam boilers that generate superheated steam. However, they would be equally suitable for hot water boilers or thermal oil heaters. The specific requirements at Nouryon also led SAACKE to develop a standard H_2 version of the SKVGD for a wide range of applications. The scope of delivery also included the SAACKE burner and boiler control system se@vis pro as well as a flue gas recirculation system with separate fan.

Exhaust gas recirculation for minimised pollutant emissions

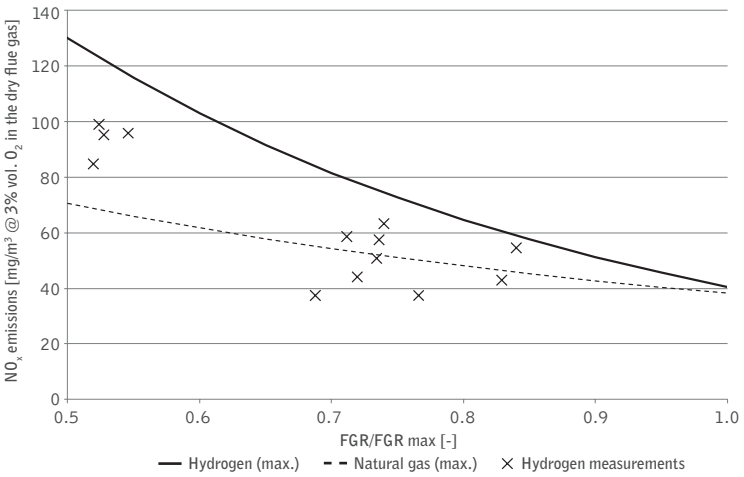
Despite all its potential, the thermal use of H_2 requires some technological measures. Compared to natural gas, hydrogen produces three times as much NO_x emissions, due to its higher adiabatic combustion temperature and approximately eight times higher flame speed. SAACKE countered this problem with a sophisticated external exhaust gas recirculation system. This process ensures dilution effects and cooling of the flame by mixing inert exhaust gases into the combustion air. In this way, the emissions in Ibbenbüren in hydrogen operation can be brought into line with those of natural gas (see Table 1).

Below: *Limit values for NO_x emissions at Nouryon in Ibbenbüren (Source: SAACKE GmbH)*

Fuel	Legal limit	Achieved measured value
Natural gas	110 mg/m³	100 mg/m³
Hydrogen	200 mg/m³	100 mg/m³
Light oil	200 mg/m³	200 mg/m³

This means that the plant not only complies with the current legislation on emissions, but even falls significantly below these limits. This is because, depending on the intensity of recirculation, emissions drop further to about 40 mg/m³ @ 3% vol. O_2 in the dry flue gas (see diagram 1), even though a relatively high recirculation ratio is currently still necessary for this.

Below: *NO_x emissions as a function of the maximum recirculation ratio (RV) of the exhaust gas at Nouryon in Ibbenbüren (Source: SAACKE GmbH)*



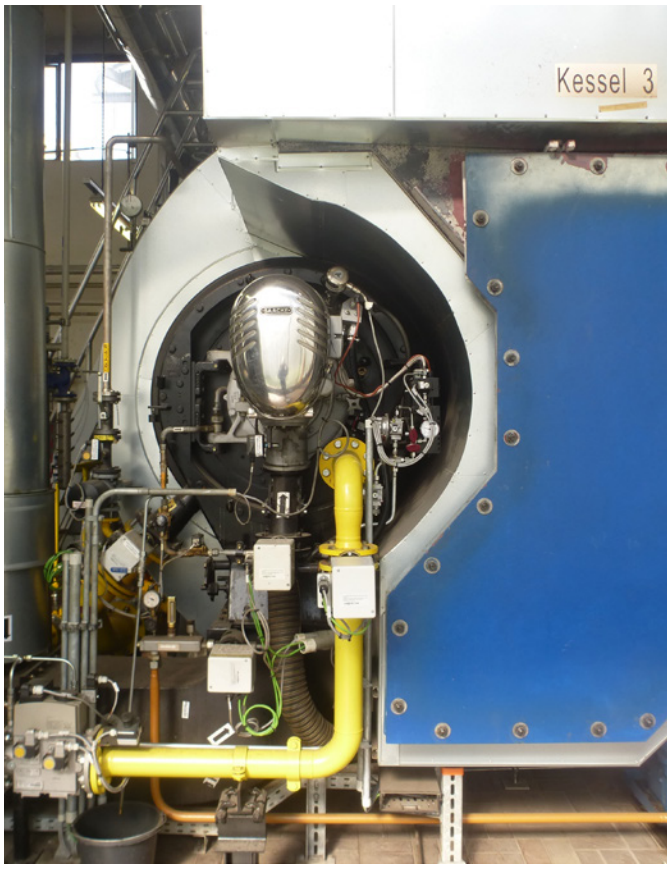
Furthermore, the high H_2 flame temperature also places special demands on the material. SAACKE responded to this with heat-resistant steel and a special gas injection design. In addition, the SAACKE experts have the pipe for the hydrogen feed flushed with nitrogen before the burner ignition in order to increase the safety aspect.

Automated control of the air volume in mixed operation

Since the SKVGD burners can be operated variably with up to 100% pure hydrogen, completely with natural gas or in any mixing ratio and are also designed for operation with light oil as an emergency fuel, a special challenge arises: The performance-specific demand for supplied air as an oxidant differs significantly. Therefore, the SAACKE control system regulates the air volume depending on the fuel mix. The extremely low gas pressure of hydrogen (50 mbar(g) before entering the gas control line) requires the use of a special gas line with a particularly low pressure loss. For this purpose, a dynamic pressure probe was installed to measure the volume flow and soft-sealing flaps were installed as valves, instead of using commercially available turbine meters and quick-acting valves.

Conclusion

The project example shows that the large-scale thermal use of hydrogen, with industrial burners, is possible and available now. "The hydrogen burners make an important contribution to reducing the CO_2 footprint of our processes. SAACKE provided us with optimal support and advice on all questions and challenges relating to the project," emphasises Stephan Richter, Head of Technical Service at Nouryon. The market-ready technology from SAACKE, for medium and high temperature heat generation, is now only waiting for sufficient fuel availability. Combustion technology has long been "H_2-ready". SAACKE UK has been at the forefront of H_2 combustion since 1981. With the technology to meet the government's ambitious goal, the company is ready to provide the solutions.



Above: *One of the three SAACKE SKVGD hydrogen burners in use at the specialty chemicals company Nouryon in Ibbenbüren*

Author: Max Krausnick, Development Engineer, SAACKE GmbH

SAACKE launches GCU evo

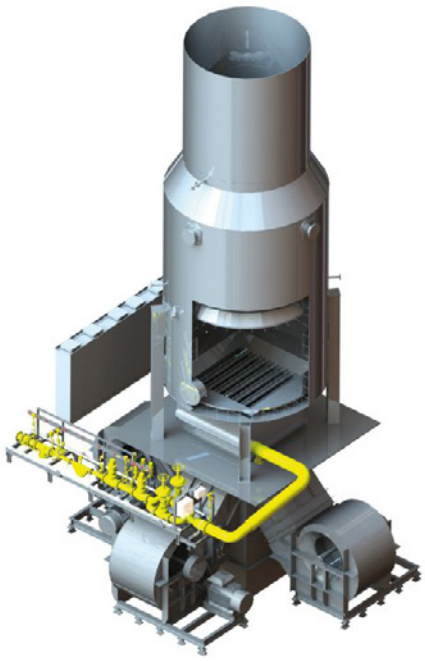
SAACKE Marine Systems is breaking new ground in methane combustion on LNG tankers. The GCU evo, a further development of the classic Gas Combustion Unit, consists of a cost-effective combination of the combustion unit with a modified surface burner. The abbreviation evo stands for 'evolution'. "In order to take into account the ever decreasing space available in the engine room of LNG tankers, we have now designed this system solution with significantly smaller dimensions with the same or even improved performance," explains Bernd König, Sales Director Offshore & GCU Systems at SAACKE GmbH. In addition to saving space, the new model offers further advantages for marine engineering. For example, emissions are reduced thanks to special cold flame technology and digital remote maintenance can be used. These are important aspects in the globally growing LNG market for shipyards, owners and charterers of LNG tankers and bunker vessels, on which a GCU must be installed as standard for the safe transport of LNG.

The optimised design not only reduces the required space on board, but also the installation costs. In addition, maintenance costs can be reduced due to the lower complexity of the system. No special foundation is required for the GCU evo with an output of 5.5 to 63 MW. The system can be mounted directly on the deck as a stand-alone unit. "Due to its compact design and functionality, the surface burner offers a short flame and requires a smaller number of blowers. In addition, due to the lower pressure loss on the air side with the surface burner, a smaller motor output is required for the blowers and the power consumption is minimised as a result. All in all, a smaller footprint and height are needed and more space is freed up for other components," explains Bernd. In contrast to two separate zones for combustion and mixing air for cooling the gases, with the GCU evo all the air is sent over the surface burner and only mixed further downstream. Instead of a separate radial blower, only one air blower is required. As a result, lower temperatures (approx. 600°C) are generated in the combustion chamber and the combustion chamber material (limit temperature: 1,100°C) is subjected to significantly less stress. "In terms of space saving as well as technical details, this GCU system is currently unrivalled on the market," says Bernd.

The further development does not forego the proven strengths of the classic GCU such as fail-safe control, electric ignition and the 100% free-flow solution for combustion of the methane components in the climate-damaging boil-off gas without a compressor and at very low pressure. In addition, SAACKE relies on the proven durability and robustness of the individual components and the overall system. "After all, all of our more than 110 GCU's in operation since 2003 are still in trouble-free operation," sums up Bernd. By means of modern remote control, operators can also perform online diagnostics from shore. Thanks to the cold flame technology described above, the pollutant limit values >100 mg/m^3 are also safely achieved or even undercut - with lowest NO_x emission values in the range of 60 to 80 mg/m^3 and CO values of 150 mg/m^3.

The GCU, which is ready for series production, is available in different output sizes from 0.4 to 4.5 t/h methane combustion with various size gradations. The scope of supply includes the GCU system including burner, control system, gas train and blower as well as spare parts service. "Our basic GCU model will also remain in our portfolio, as it also covers output ranges of up to 6.5 t/h of methane for exceptional applications and can burn oil," emphasises Bernd König.

LNG tankers are designed for the transport of liquefied natural gas. The liquefied gas is stored in the tanks at a temperature of about -163°C. Despite the insulation of the cargo tanks to limit the heat input, small amounts of heat always enter the tanks and cause the cargo to vaporise slightly. This so-called boil-off gas is unavoidable, especially when a ship is moving, and must be removed from the tanks to prevent an impermissible increase in pressure. Therefore, the GCU's completely burn the excess boil-off gas, which is harmful to the climate due to its methane components.



Introducing the SAACKE Operations team

The Operations team is a small but effective team of 5 with over 115 years' combined service at SAACKE. As such, they offer a wealth of knowledge in all areas of purchasing, project management, production and delivery.

Above: *The Operations team, (L to R - back) Mark Badger (Operations Supervisor), Josh Rendle (Operations Co-ordinator), (L to R - front) Alan Lester (Stores/Wireperson), Keith Tester (Lead Stores/ Spare Parts Technician), Daniel Howe (Stores/Wireperson)*

Mark actually started out as an Apprentice when he first joined SAACKE in 1983 and Josh too started out as an Apprentice when he joined a few years ago.

Following order processing, the team start planning, looking at potential risks at an early stage to manage potential pitfalls with the sales and design teams, whilst also reviewing the requirements of the delivery schedule. Upon release of the design documents, the work starts in earnest. Josh will start ordering all parts that are non-stock and also ordering stock requiring replenishment. Mark will review the information provided, continuing to plan how/who/when the equipment goes into build to ensure on time delivery.

In the stores area, Keith, who joined us in 1984, will be busy receiving deliveries whilst packing and despatching spares orders daily, as well as picking the kits that produce the assemblies for both main sales and spares. Once parts arrive, Alan, who also joined us in the 80's, will get on with the construction and wiring of the control panel to the exact requirements of the customer, working closely with the designer to ensure compliance. Daniel works in all areas of the workshop and stores. He will cover Keith or support him when things get busy, whatever needs to be done to get your order to you. However, his main priorities are building the control panels and the mechanical assemblies for both main sales and spares. Daniel is also the man who jumps in the car to go to a supplier to get that urgent part that needs to go out that day so that your equipment can be back up and running quickly.

Mark and Josh will continually monitor progress, following up any challenges and working closely with all suppliers and internal departments to ensure their colleagues in the workshop are able to meet customer needs. As the order nears completion, the delivery is planned through direct contact with you or your Regional Sales/Service Manager to ensure a smooth delivery to site.

The Operations team does not stop there. As our Engineers start work on site, Operations support them providing additional parts as required and as quickly as possible, to ensure a successfully completed project.

To talk to us about your next project or spare parts requirements, please call **+44 (0) 23 92 333900** or send an email to **ukadmin@saacke.com**

We work in all weathers!

Our Engineers work in all conditions and not only in warm dry boiler-houses as some people might think. The photo below shows one of our Engineers working at a site on a very wet day. Peter Kruszynski (Senior Service Engineer, South) comments that a fishing umbrella is a very useful part of his tool kit!

Welcome

We are pleased to welcome:

Bradley Corbould
Electrical Design Apprentice, Havant

Dominick Lundon
Service Engineer, North

Congratulations

Mihai Sisu (Regional Service Manager, Midlands) who has recently celebrated 10 years

Kenny Marshall (Regional Service & Sales Manager, Scotland)

Gavin Cross (Spare Parts Co-ordinator, Havant) who have recently celebrated 25 years with SAACKE UK companies.

We offer Covid-19 testing to our staff
In partnership with NHS Test and Trace

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UK team snippets

Congratulations to:

Lewis Barnes (Service Engineer, South) and his partner Sarah on the birth of their daughter Mabel Jane born on 29th October 2020.

Barbara Diplock (Service Administrator, Havant) on the birth of her second grandson, Jacob Thomas. Jacob was born on his great-grandfather's birthday, 14th April, and is named after his great-great-grandfather with his middle name, Thomas. Barbara is loving all the grandparenting duties! Jacob is pictured below with his big brother, Wyatt.

Richard Sheehan (Regional Service & Sales Manager, Ireland) who retired on 31st May 2021 after 33 years with the SAACKE Group. Best wishes for a very happy and healthy retirement, Richard!

John Minnock who takes over from Richard Sheehan as Regional Service & Sales Manager, Ireland. John previously worked closely with Richard as a Senior Service Engineer.

Our newest Apprentice, Bradley Corbould (Electrical Design Apprentice, Havant) who has recently joined us. Bradley is currently studying a BTEC Level 2 Diploma in Advanced Manufacturing Engineering and once that is completed, he will progress on to a Level 3 Diploma. Good luck Bradley!