

Elements



Launching the Chemicals Northwest 2023 Awards

In this issue:

- Understanding natural hazard risks to your site.
- Ageing industrial assets in the UK.
- Manufacturing news from the sector.
- Ensuring sustainable management of process safety for chemicals.
- Roadside eye tests – how good is your eyesight?
- CHEMUK 2023
- New member spotlights...



Chemicals 
northwest

2023 Awards

23rd March

Book your place!

To enter the awards and book places please visit
https://www.cia.org.uk/chemicalsnorthwest/awards_2023

The Awards will be held at the
Hilton Manchester
Deansgate, Manchester

Elements is published by
Chemicals Northwest
The Innovation Centre
Sci-Tech Daresbury
Keckwick Lane
Daresbury
Warrington
WA4 4FS

The Chemicals Northwest Team is:



Ian Cranshaw
Operations Manager
cranshaw@cia.org.uk



Alex Abraitis
Member Services
& Events Manager

For membership, event or advertising enquiries please contact:
Alex.Abraitis@chemicalsnorthwest.org.uk

Designed and Printed by:



2co Limited
www.2-co.com
Email: info@2-co.com



CIA | Chemical Industries Association

Chemicals Northwest is part of the
Chemical Industries Association

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Membership

Would your company benefit from joining an organisation that supports and promotes the chemistry-using sector in the Northwest? Do you want to understand more, and contribute to, the industry issues within the region?

If you are a manufacturer, chemical user or offer products and services to the sector, why not join us today?

<https://www.cia.org.uk/chemicalsnorthwest/Membership/Benefits-Costs/2022-rates>. (from 1st April 2022)

Micro corporate membership (1 - 10 employees)	£469.79
Standard corporate membership (11-100 employees)	£817.11
Large corporate membership (100+ employees)	£1039.86

Our membership year runs from 1 April to 31 March. A pro-rata basis usually applies to joining at other times in the year and we'd be happy to discuss on application.

Welcome

Dear Reader,

Welcome to the Winter edition of Elements and my first one back after maternity leave. Having kept up with all the latest members news and industry developments over the year it is good to be back promoting your achievements and being part of the vibrant chemical industry once again. I know it is a particularly difficult time for some with energy costs at record highs. And yet many report still being very busy with new projects and opportunities.

In this edition of Elements, we cover a diverse range of topics from our members including manufacturing news, energy, boilers and power, recruitment, language, and roadside eye tests. Reviewing such a mixture of articles from our sector reminds us just how varied and interesting the industry is and the companies who feed into it.

We warmly welcome Glacier Energy, Klüber Lubrication and Mathys & Squire LLP into Chemical Northwest membership. Find out more about what they have to offer on pages 29 and 30.

The countdown is now on to the Chemicals Northwest Awards on the 23rd of March at the Hilton Manchester Deansgate. With the imminent deadline for the award entries approaching, the team at Chemicals Northwest and the judging panel are looking forward to receiving your citations and reading about the excellent and innovative work coming from the chemical industry and its supply chain. In this edition, Axiom Engineering Associates look back on their win in 2022, have a read and consider how it might inspire your workforce and colleagues (page 26).

As this edition is going to print, we look forward to welcoming 4 speakers to the next breakfast event on the 7th of December. Speakers represent a wide range of topics from EV batteries - a particular growth opportunity for the chemical industry, science experiments to carry out with children, the Business of Science Conference, how language services can help to increase exports and multidisciplinary engineering approaches when conducting OBRA. Please keep an eye on our website to register for this event and for other upcoming events, news, industry updates, careers information and the latest Elements magazine <https://www.cia.org.uk/chemicalsnorthwest/>

If there is anything else you need from us, please do not hesitate to get in touch.

Alex Abraitis - Member Services and Events Manager

About us...

Chemicals Northwest is an established business network wholly owned by the Chemical Industries Association.

With around 160 members we actively promote this important regional sector and our objective is to help membership to grow through;

- **facilitating** networking events, common interest groups and interactive workshops, all aimed at covering topical industry issues.
- **supporting** projects and programmes that identify and enhance business performance and generally support continuous improvement across the sector.
- **promoting** science and engineering based skills, helping to address the region's future needs.
- **improving** the image of the industry overall, including generating a positive reputation, through communicating achievements and success.
- **contributing** to the industry's strategic voice and the national growth agenda aligned to the work of the Chemical Industries Association.
- **connecting** the community of chemistry-using businesses and the vital supply chains here in the Northwest.

Chemicals Northwest really does bring people together! It is an essential feature of successful networking strategies used by many organisations. We coordinate a range of meetings and events to enable 'face to face' networking for the benefit of all members. Every successful business networking organisation also needs effective communications channels.

As a result of gradual development over recent years, getting messages across, promoting member companies and reporting news, Chemicals Northwest has reached new levels of topicality and quality.



The impact of the energy crisis on using pumps in chemical and industrial manufacturing

Manufacturing is undoubtedly a highly impacted sector in the current energy crisis. With natural gas prices remaining high while electricity prices continue to fluctuate and rise, manufacturers are feeling the pressure. If you're a chemical or industrial manufacturing company, you know first-hand how these rising utility costs impact your day-to-day operations. As a result, many manufacturers are looking for ways to reduce their energy usage and costs by using more efficient processes and technologies.

Be Proactive with energy monitoring and management

The first step to managing your energy costs is to track them. By monitoring the energy your company consumes, you can identify where you can reduce energy consumption, and thus, reduce costs.

Utilize continuous manufacturing

Lean manufacturing is a method for reducing waste and increasing profit by eliminating any non-essential activities in the production process. For instance, if your company has multiple production lines running at the same time, you can reduce waste by supplying each line with the exact load of raw materials needed. This means setting up a materials replenishment system that delivers just-in-time or continuous raw materials to each line based on their production rates.

Choosing electric pumps over air-operated

Compressed air is one of the most expensive commodities, however, as most manufacturing sites have compressors, it can often be overlooked as an expense. Choosing the right

type of pump for a specific application and monitoring energy usage through sensors can help improve energy efficiency across your whole site. One of the ways we can do this is by switching from air-operated pumps to electrically driven pumps, or, more specifically, the electronically operated air diaphragm pump

Recently, the impact of rising energy costs has been talked about from a domestic standpoint but commercial energy usage doesn't benefit from a price cap with some large sites reporting unit prices of around £0.34 per kWh with some companies seeing a 400% increase from this time 7 years ago pushing energy-efficiency higher up the agenda.

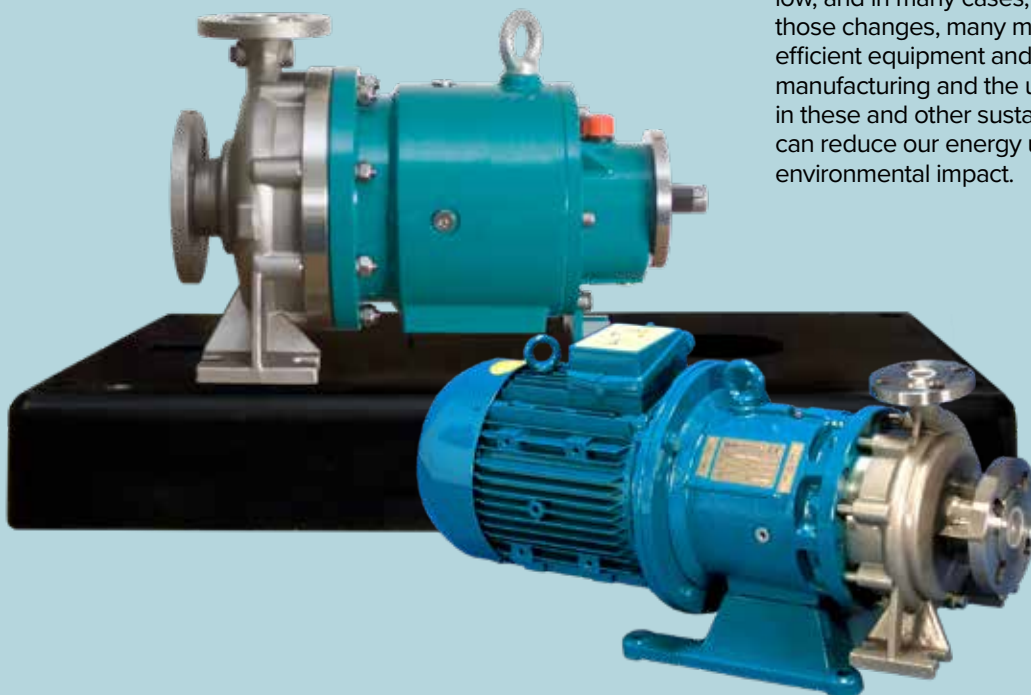
Example 1:

Unloading pumps were being run 24 hours a day for unloading applications because the product would solidify when it cooled down. To save money and increase efficiency, the existing pumps were replaced with stainless steel magnetic drive pumps which could be run using a motor half the size without compromise and the new pumps were fitted with heating jackets to maintain the temperature utilising steam that was readily available preventing the product from solidifying when cooling. By reviewing and modifying the original process, this site went from using 397,440 kWh of electricity each year for four units down to 198,720 kWh per year and reduced CO2 emissions by 90% saving £31,000 in operating costs – before the recent energy price increase, in 2022, this saving is now closer to £60,000 a year.

Example 2:

An air-operated diaphragm pump is being operated 24 hours a day, 7 days a week, 51 weeks of the year using 63,310 kWh of power during this time. By swapping the pump out for an electronically operated diaphragm pump which uses just 4847 kWh – that's 90% less power for one unit or a saving of over £18,100 (not including VAT).

The energy crisis is impacting manufacturers of all industries, forcing us all to make changes to our operations to keep costs low, and in many cases, ensure their survival. In order to make those changes, many manufacturers are turning to energy-efficient equipment and techniques, such as continuous manufacturing and the use of electric pumps. By investing in these and other sustainable manufacturing practices, we can reduce our energy usage and costs, while also reducing environmental impact.



Kevin Pratt
Business Development Manager
CDR Pumps (UK) Ltd
For further information visit
<https://www.cdrpumps.co.uk>



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Understanding natural hazard risks to your site

Natechs (Natural Hazards Triggering Technological Accidents) refers to accidents initiated by natural causes, including earthquakes, lightning and flooding, all of which have the potential to impact high hazard industrial sites. Major accidents have the potential for catastrophic consequences to people and the environment as well as business reputation and sustainability. Such natural hazards can both trigger major accidents and weaken safeguards in place to prevent, control and mitigate them. For this reason, the risk posed by Natechs needs careful consideration.

Natural hazards can be broadly categorised as seismic, hydrological and meteorological (e.g. earthquakes, flooding and wind storms respectively) and will have different likelihoods, severities, warning times and consequences. Generally, natural hazards will impact widespread areas. Climate change also plays a role, typically increasing the likelihood and severity of hydrological and meteorological events.

An example of a Natech accident in recent history is the floods that occurred in Central Europe in August 2002. In total, 232 lives were lost and one site, in the Czech Republic, was struck particularly hard. Large volumes of chlorine gas were released from pressurised storage tanks. The flood itself was a one in five hundred year event and as such, the severity was unprecedented, with the hundred year water level of the site being exceeded by 1.3 metres. Whilst it may not be practicable or justified to implement safeguards for events of unprecedented scale and severity, consequences involving the loss of containment of hazardous substances are still possible during lesser events, highlighting the importance of robust safety measures. Since the consequences of Natech events are often severe, just being aware of them is not enough and the duty holders of hazardous sites must be proactive in their approach to understanding, assessing and managing the risk.

Risk reduction and preparedness for natural hazards is something which is often overlooked. There is a requirement under the COMAH Regulations and the Seveso directive for sites to understand their risks from natural hazards, with some other countries having specific laws/ programs regarding the protection of people from earthquakes and/or tsunamis. There is however a shortage of dedicated methodologies and guidance for assessing and managing Natech risks. In addition, for some natural hazards there is a limitation to the measures which can be implemented, and other measures may be deemed too costly, especially if considering the likelihood of the natural hazard event at the site versus a non-Natech major accident hazard event. Many measures in place to prevent a major accident hazard may not work in a Natech incident, meaning that crediting these barriers needs to be done with caution.

The use of hazard mapping, such as flood maps, may be useful for understanding the current risk, and can include inundation areas in the event of sea level rise and climate change. In New Zealand, GNS Science have provided vulnerability and evacuation maps to the government, authorities and private industry which focus on the possibility of a tsunami. The maps show the areas in the most danger and provide vital information for evacuation planning. These types of maps can also be available for other natural hazards such as volcanoes and can be used to help inform site emergency response plans, as well as the emergency response plans for the local authorities. It should be noted however that in a Natech event, there is a reasonable chance that emergency response teams would not be able to reach the site(s) requiring support. This may be due to damaged access roads, services being overwhelmed by the public, or the services themselves being affected by the hazard. This may reduce the resources available to sites in an emergency and should be considered in response planning.

There is no 'one size fits all' when it comes to specific sites and hazards. Therefore, duty holders need to understand the risks posed by Natech events to their specific site and then ensure they are informed of what equipment may be impacted, how, and what to do in the event of a natural hazard. Although there may be a low likelihood, natural hazard events can often be a case of 'when' not 'if', and so we must be prepared for their eventuality.

For further details visit <https://www.ras.ltd.uk>





IKM's integrated teams have supported bulk fuel storage, manufacturing and transmission terminals throughout the UK for twenty-five years.

Our asset experience has helped some of the biggest industrial and chemical manufacturing firms inspect, assess and remediate on-site engineering and environmental issues.

From site clearance and demolition to occupied building strategies - our team have a depth of knowledge to develop cost-effective and sustainable solutions.

For business enquiries, please contact:
Eddy Winters
Head of Business Development
eddy@ikmconsulting.co.uk

RUNCORN OFFICE

The Heath Business & Technical Park

info@ikmconsulting.co.uk

+ 44 1928 511 043

www.ikmconsulting.co.uk

Ageing industrial assets in the UK

Critical industrial manufacturing assets throughout the UK are ageing; key UK industrial hubs such as Grangemouth, Ellesmere Port, and Teesside have industrial histories dating back over 100 years. In our experience working on various ageing assets throughout the UK, the plant and civil infrastructure on these types of facilities tends to be over 40 years old.

With typical design life for civil & structural infrastructure being between 25-50 years, it begs the question: Is enough being done by asset owners to understand the condition and risk posed by these ageing assets to the safe and continued operation of their site?

In our experience, the answer to this question is often no.

The fundamental function of all civil & structural assets is to safely support applied loadings be it equipment, environmental, operational, or human. As assets age, it is essential that integrity is understood, monitored, and maintained to ensure that it functions to meet its current performance requirements, which may change over time due to plant modifications. Regular maintenance can have substantial cost implications for older assets, and as such, these are often considered lower risk and an unnecessary spend. The repair of identified defects is often delayed or ignored until they begin to affect operations or the safety of personnel.



*What was found under when investigated...
holing, severe section loss, heavy pitting and failures.*

Redundancy within the design and ductility of construction materials often means signs of distress are identified prior to a major collapse occurring. However, once an operational industrial structure reaches a severe level of distress, it is significantly more expensive to safely correct the defects. Furthermore, this may have already led to damage to mechanical plant due to excessive stress in pipework, or vessels due to deformation and movement.

Over the last few years, IKM has been involved in several major remediation projects on ageing assets. These projects resulted in severe financial and operational consequences for our clients due to:

- Complex repairs in constrained, congested areas of the plant,
- Unplanned capital expenditure,
- Unplanned shutdown of business-critical plant; and
- Associated loss of earnings.

In each of these projects, poor detailing coupled with a lack of maintenance and action on historical inspection report recommendations for further investigation allowed significant structural deterioration to occur.

The unsafe operational conditions resulted in the client having to isolate and remove plant from operations, costing millions of pounds in repairs and lost revenue. These defects

were de-prioritised as they initially looked minor; however, further investigation quickly identified hidden defects behind fireproofing and encasements.

Although the severe cost implications associated with these major repair projects affected our clients greatly this could have been much worse. The consequence of a structural failure, particularly within a high-hazard process or industrial environment, can be catastrophic, leading to a loss of containment and ultimately more serious financial, legal or business continuity implications.

Sharing our experiences and learnings from recent projects, we would encourage asset operators, to consider the following:

- Understand the asset. Including degradation mechanisms, key member utilisations, critical component members, previous repairs, known defects, existing conditions and criticality of the asset to the business.
- Implement robust inspection regimes. These should be appropriate to the type, age, condition and criticality of the plant. This will ensure emerging structural issues and deterioration are identified quickly, providing an opportunity for planned maintenance.

- Act on inspection recommendations in a timely manner. This will ensure minor issues do not deteriorate into major costly repairs. Investigating signs of distress (cracking, movement, etc) early will ensure that business risk is minimised and known.

- Undertake timely maintenance. Depending on environmental and operational conditions, minor defects have the potential to significantly deteriorate when left unchecked.
- Remove redundant plant. Aging assets often have large quantities of redundant plant left in situ, adding additional and unnecessary loading to the structure. Redundant plant often obstructs inspection, hinders access, and adds risk that could be easily mitigated.
- Understand and control modifications. Uncontrolled modification can have severe implications on a structure causing deformation, deterioration, and potential failures. These changes typically make repairs more complex.

It is important, particularly in post-COVID recovery and financial uncertainty, that ageing assets reaching or surpassing their design life are not neglected. Allocating appropriate funding and implementing regular inspection and maintenance programmes, could at minimum, save assets a lot of money and reduce operational outages.



Author: Gordon Nelson, Lead Engineering Associate

**For further details visit
<https://www.ikmconsulting.co.uk>**

Chemical Processing Services Ltd, a new organisation pioneering the development of bio-based thermosets

With the ever-increasing awareness of the need to rectify the environmental damage inflicted on our planet, and the drive to prevent resource depletion, the development of new thermoset polymers from sustainable feedstocks is one part of the holistic approach that is required to fulfil this aim.

Paul H. Jones FRSC, founded Chemical Processing Services Ltd [CPS] as a breakaway business to house some of his latest Intellectual Property, and licence new patented technology focused on sustainability and/or an absence of specific toxins and carcinogens. Working with his favoured European IP Law firm, Mathys & Squire, he has had several of his patent applications accelerated through the UK Green channel due to the environmental benefits afforded by the new technology he is offering.

Paul stated, "Mathys & Squire are exceptional and their specialist expertise in chemistry and legal protection, has been invaluable in building in the necessary security to allow me to operate open licencing arrangements. They are outstanding partners and an essential element in my continuing strategy to generate new innovative, safer, and more sustainable products to move away from petrochemical reliance without compromising performance".

CPS has licensed new Globally Patented Furalkamine technology, that includes highly acid resistant cross-linking agents for epoxy resin that have been derived from a pentosan-rich waste biomass. This new chemistry encompasses a series of polymers with high new carbon bio content, and the range is continuously being extended. CPS followed this up with some further Patent applications including Poly-Mannich bases, Stoichiometric bio shift polymers, low temperature amido-amines and Bio-

Benzoxazines all at different stages of examination and approval. These products are being tested and applied in high performance coatings, and as matrix resins in fire resistant light weight composite panels for use in several areas of the transport sector. The newly designed polymers employed in this environmental quest are formulated from sustainable feedstocks, processed in accordance with good environmental principles, are already scalable, economically viable, and perform to the desired level.

CPS operates in conjunction with selected partners who share the same ethical standards, commitment, and drive towards compliance with UN Sustainable Development Goals. With extensive performance testing under the most arduous conditions, these materials are proving to be outstanding replacements for the current petrochemical products. Aside from generating products from sustainable sources and considering atom economy, waste elimination and catalysis to minimise energy consumption, CPS continuously reviews modification techniques for re-use and recovery strategies. Paul has developed products for the packaging coating sector, that enabled BPA free systems to be employed as internal lacquers and he is accustomed to horizon scanning in order to eliminate Substances of Very High Concern [SVHC's] and prevent regretful substitution. Some of the latest products being developed, include some new bio epoxy resins. Epoxy resins are ubiquitous, and these new green systems are being evaluated in a myriad of applications.

Alongside the development of these products and the licensing arrangements made for their manufacture, I know Paul would insist that we take the opportunity to support and promote the Catalyst Science Discovery Centre and Museum in Widnes. CPS and Bitrez are currently helping promote their excellent work in providing interactive exhibits to help bring science to people of all ages in an entertaining as well as educational manner. Visit <https://www.catalyst.org.uk/> for further details.

To find out more about Chemical Processing Services Ltd visit the website www.cps-consultancy.com/. Or for Mathys and Squire LLP visit <https://www.mathys-squire.com>

Author: Wendy Howarth

Itaconix and Croda renew supply agreement for Sustainable Odour Control

Itaconix (AIM: ITX) (OTCQB: ITXXF), a leading innovator in plant-based specialty polymers used as essential ingredients in everyday consumer products, is pleased to announce a new global agreement with Croda Inc. ("Croda") in odour control, which serves to extend a supply collaboration that began in 2017.

Under the terms of the new supply agreement, Itaconix will continue to produce and supply the proprietary ZINADOR® odor neutralizing ingredients for Croda to market and sell globally in home care applications. The new agreement adds a newly formulated product to the collaboration and updates the terms and arrangements for ongoing market developments.

Scott Tuchinsky, North America Business Head Consumer Care at Croda, commented:

“The ZINADOR® products are an important part of our plans to continue growing our leadership position in sensory technologies and solutions. We have established a global customer base for these products through our initial efforts and see attractive opportunities for further success as more brands and consumers choose the performance and sustainability benefits of Itaconix polymer technologies.”

John R. Shaw, CEO of Itaconix, added:

“Our collaboration with Croda is bringing the value of our odour neutralisation to more customers around the world in a growing range of fabric and air care products. We are pleased with Croda’s continued commitment to working with Itaconix, and are excited that this new agreement expands our partnership. I expect continued progress in brand usage and new applications through our joint efforts.”

Graphene Composites (GC) and William Blythe announce partnership in supply of graphene oxide for unique ink coating that destroys pathogens

Graphene Composites (GC), a leading innovator in advanced materials engineering and William Blythe, leading chemicals innovator and part of the Synthomer Group a FTSE 250 company, announce a successful partnership in William Blythe’s supply of graphene oxide for use in GC Halo®, a unique coating for air filters that destroys viruses, bacteria and mould on contact.

GC Halo is a powerful nanoparticle ink formulation, that destroys pathogens by forming a ‘trap and kill’ layer on air filters and has been independently verified to significantly reduce SARS-CoV-2 coronavirus in the air. Fast-acting, safe and more than 99% effective against SARS-CoV-2 coronavirus, Influenza, bacteria and mould, independent tests and certifications prove GC Halo’s capabilities as a filter coating.

William Blythe have recently scaled up their manufacturing facilities for graphene oxide production from lab-scale to a 50-tonne capacity of high purity graphene oxide dispersion product. Partnered with its advanced quality control laboratory and leading process safety know-how, this provides a robust supply of high quality, consistent graphene oxide for the GC-Halo® product.

“The quality, stability and purity of graphene oxide produced by William Blythe and used in the manufacture of GC Halo, ensures that we have a very stable product” says Dr Steve Devine, CTO at GC, “coupled with their new, large scale production facility, provides significant reassurance for ongoing quality and production in the supply chain”.

Commenting on the partnership, Michael Butler, Technical Director, said, “A significant amount of effort has been devoted at William Blythe’s facilities in Accrington, UK, to producing a world-leading graphene oxide product at industrial scale. I’m delighted to see it deployed in the GC Halo air filter where it will improve health and hygiene by efficient destruction of harmful pathogens.”

GC are now exploring the potential to extend the GC Halo product into other areas.

Find out more at
www.gc-halo.com.



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ON-DEMAND



FACE-TO-FACE



IN-COMPANY

IChemE HAZOP and LOPA training

The Institution of Chemical Engineers (IChemE) offers quality-assured training for chemical and process engineers. All our courses are peer-reviewed to reflect best practice and current thinking to help you and your organisation improve process safety and reduce risk. Our popular HAZOP and LOPA training is offered as either online, face-to-face or in-company. Check out below which course is right for you or visit www.icheme.org/training to see our full range of courses.



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HAZOP Leadership and Management

Learn how to effectively lead, manage and organise a HAZOP study team

This course explores best practice in HAZOP leadership and management. You will learn about the application of the technique and how to plan and manage study programmes more effectively. You will also learn how best to lead study teams to ensure maximum effectiveness and successful project execution. Case studies will allow you to undertake a range of project team roles and provide the opportunity to guide a team through the HAZOP process.

www.icheme.org/live-hazop-leadership

www.icheme.org/hazop-leadership

HAZOP Study for Team Leaders and Team Members

Develop your HAZOP skills on this practical course

This course provides effective, realistic training for HAZOP team members and new team leaders. Alongside presentations covering all the essential aspects of the method, you will participate in workshops using HAZOP methodology for continuing processes, sequential operations and computer-controlled plant. Much of the course is dedicated to group work on realistic HAZOP studies, giving team leaders and team members practical experience in their respective roles. Examples are drawn from a range of industry sectors and typical reports are also provided.

www.icheme.org/live-hazop-team

www.icheme.org/hazop-team

Layer of Protection Analysis (LOPA)

Learn about the LOPA methodology and how to apply it

This course will help you understand how significant scenarios are categorised and tolerable frequencies assigned for identified hazardous events. You will also learn to assign risk categories and determine how many Independent Protection Layers (IPLs) should be in place. The course also covers the specification and requirements for a protection layer to be accepted as an IPL. All the essential LOPA steps are practised in workshops, including the use of software tools. Course materials also include a compendium of LOPA research papers, reference materials and further reading.

www.icheme.org/live-lopa

www.icheme.org/lopa

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Lankem dispersing agents made from BioLoop technology

In a previous article, we mentioned our novel developments around bio-based technology and the new BioLoops are based on renewable raw materials. These products are BioLoop 56L, BioLoop 68L and BioLoop 84L. After further modifications of the products, we found that they can be utilised as dispersing agents for organic and inorganic pigments. Finding use in aqueous systems, but one modification has shown potential in aqueous and solvent-based systems.

Dispersing agents help to produce a homogeneous state of dispersed pigments into a few various binders.

The dispersion process is vital. Indeed, it will influence many parameters such as appearance, colour strength, transparency, gloss, etc., but also the paint's physical properties, rheology, and stability flocculation. Understanding this process is a significant help to prevent many coatings defects.

Dispersion of pigments can be broken into three steps, wetting, dispersion and stabilisation.

1) Wetting is the first step of the dispersion process in which air and moisture are displaced from the pigment surface by the dispersing agent. The air must be fully removed, and the pigment surrounded by the liquid medium.

2) Dispersion is where the pigment agglomerates are separated by energy (milling machines) to their primary particle size. The dispersant additive helps to reduce the pigment–pigment interaction and lowers the viscosity. This action allows you to add more pigment. As the particle size reduces, the surface area increases, thus bringing about an increase in gloss and colour strength.

3) Stabilisation is the most critical stage of the process, and the dispersant needs to have good wetting and dispersing properties to be able, over a period, to keep the particles separated as the natural tendency is for these particles to re-form (flocculate). The smaller the particle size, the more likely it is for them to re-form, this can be prevented by introducing repulsive forces onto the pigment using anchor groups on the dispersing agent.

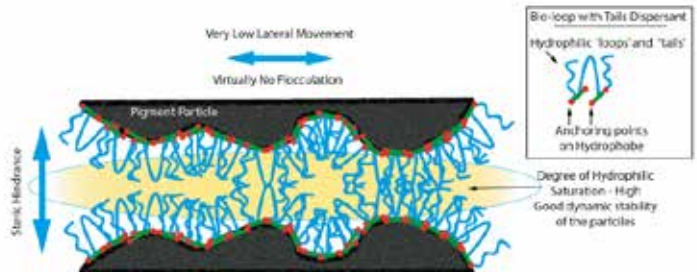
There are two main ways of stabilising the pigment particles, described below.

• **Electrostatic stabilisation** occurs when particles have the same electrical charge and hence cause repulsion between the particles. What happens is stabilisation through an electrical double layer, in which each layer has an equal charge, and when two particles come together, their respective charged double layers overlap, and repulsion occurs. However, when this type of stabilisation is the only mechanism, this is susceptible to changes in pH.

• **Steric stabilisation** in this type of stabilisation, dispersants based on polymer molecules are the preferred option. They have two key features, one is a pigment affinic (anchor) group and a second binder compatible group.

At present, the two main products which have been developed from the modification of the BioLoops are Lansperse LT87 and Lansperse BIO691.

Simplified structure of Lansperse LT87



Our products were developed using a natural backbone which contains anchoring groups. What makes them unique is the introduction of a hydrophilic loop that not only has an affinity for water and polar solvents but also, provides both steric hindrance and stability. To help boost the hydrophilic nature within the spacing between the particles, Lansperse LT87 contains both loops and tails. This helps to give further improvements in stability and flocculation reduction. Lansperse LT87 has been shown to deliver excellent stable carbon black dispersions in aqueous systems.

Key Features

- Based on the BioLoop technology
- Powerful dispersing properties
- Low flocculation
- VOC free
- Fast particle size reduction
- Good ecotoxicity
- No skin or eye irritancy

Lansperse BIO691 is part of the new range of powerful dispersing agents containing components that are from renewable sources. Unlike many bio-based surfactants, this product offers excellent wetting and dispersing properties for a wide range of inorganic and organic pigments and powders.

One main characteristic that makes both these products different from conventional dispersing agents is how they can attach to a particle substrate.

Conventional dispersing agents tend to be linear in structure and attach to one hydrophobe group. The BioLoops are different as they have two hydrophobes that attach to a particle substrate which makes it twice as effective as conventional dispersing. Lansperse BIO691 is unique because of its ability to disperse particles in aqueous and solvent-based mediums. An aqueous dispersion manufactured using Lansperse BIO691 can be incorporated in solvent and aqueous-based paints without detriment to performance. This property is suitable for universal tinters and useful for formulators that want a multi-functional dispersing agent.

Phone: +44 (0)161 513 4125

Email: sales.enquiry@lankem.com

Website: www.lankem.com

Ensuring sustainable management of process safety for chemicals

In the chemicals industry, safety is priority number one. But how do you ensure safety in a sustainable way? When it comes to calibration, the answer is a modern, digitalised, and automated solution.

There's a reason safety is so important in the chemicals industry. If something goes wrong, it's not just an issue for the plant and its employees – it can also impact people living in the surrounding area. This is one of the reasons that chemicals are so strictly regulated.

Chemical plants need to maintain strict quality management and hold detailed product information. Chemical process companies must be able to capture data from operational processes accurately in order to be prepared for product recalls. In case of audits, all of this data must be easy to find.

How automation helps

This is where automated and digitalised calibration solutions come into play. All of the instruments that are part of this safety process need to be accurately calibrated to ensure they're working properly. However, in many plants this process still relies on paper certificates. While paper may feel reliable and tangible, there is a substantial risk of human error in the process. Each calibration typically has 20 data points or more, so even if the error rate for writing down results is only 1%, this means one in every five certificates is likely to contain faulty data.

With automated calibration, results are captured automatically in a digital format and sent securely to the calibration management system. This gives 100% accurate, tamper-proof results. Even better, finding certificates is as simple as performing an online search instead of manually looking through mountains of binders full of paper.

A repeatable process brings sustainability

Another advantage of automated calibration is repeatability, which improves business sustainability. One challenge chemical plants face is the changing skill sets of the technicians who perform the calibrations. When this is combined with out-of-date test and measurement equipment, there is a genuine risk of instruments drifting out of tolerance.

Automated calibration helps solve this problem. Instead of varying in quality, every calibration is performed to the same highly accurate level as the calibrators can

offer step-by-step guidance to technicians. The process is also faster – by cutting manual steps such as the need to fill in paper certificates or enter results into a database at the office, technicians can save 50% of the time needed for calibrations.

Ensuring safety

The repeatability, reliability, and accuracy of automated calibration also means better safety. This is because chemical plants can be sure that instruments critical for process safety are reliably calibrated and within tolerance. Well-designed calibration systems also enable technicians to include checklists as part of the calibration procedure – which

is critical in ATEX environments and other scenarios where very clear procedures need to be followed to ensure safety.

**Learn more by downloading this whitepaper for the full article: <https://hubs.la/Q01gS5pW0>
Or visit <https://www.beamex.com/> for further details.**



CALIBRATE
COMPUTER

Roadside eye tests – how good is your eyesight?

Ensuring eyesight is good enough for driving is not down to the individual alone. Under health and safety laws, the employer has a responsibility to ensure that employees are fit to drive and that your drivers have adequate vision.

As an employer, you have legal obligations to any employees who drive whilst at work – that's not news. However, there are areas that you should focus on to protect yourself from prosecution and ensure that your own insurance is not prejudiced.

Eyesight tests have been a hot topic for some time, accidents involving a driver with poor vision are estimated to cause almost 3,000 casualties and cost £33 million in the UK per year¹. And with an estimated 9 million drivers on Britain's roads with vision that falls below legal standards², an average of 7,000 people a year lose their licence due to failing eyesight³.

The ability to see clearly is crucial for driving safely. Given that our eyesight can deteriorate as we age, and with more people working into their sixties and beyond, it's likely to be a growing problem for businesses with company vehicles.

While all drivers are required to pass a simple eyesight check during their test, without any future assessments, there are no plans to change the current regulation, despite a staggering 70% of UK adults (approximately 29 million drivers) admitting that their eyesight has worsened since they passed. The figure is naturally greatest amongst over 55s (84%) but is still worryingly high for younger drivers. Over half of 18-24-year-olds (55%) and 25-34s (59%) confess that their vision has deteriorated⁴.

Don't risk your life or your licence

The police have the power to revoke the licence of any drivers who fail the roadside eye test, which could prove to be a major operational issue for employers who have staff operating company vehicles to deliver their services to their clients. Imagine having even 5 per cent of your operational workforce unable to use your vehicles to provide your services, get to site or move goods.

Legal responsibilities for employers

Under GB guidelines, Driving and riding safely for work, employers must make sure drivers are safe and healthy and have the required physical capabilities – including no sensory impairments – and training to drive safely. The duty of care to employees while driving covers any policies and training focus on safe driving, vehicles and routes. Within this guidance is the requirement to ensure all drivers have regular sight checks.⁵

So what can you do?

As an employer, ensuring anyone who drives on company business has a regular eye test, and that this is recorded. Just providing access is probably not enough - despite 72% of 500 businesses involved in a 2019 research project for Specsavers Corporate Eyecare and YouGov confirming they provide access to eye tests, nearly half (45%) were concerned that their employees who drive for work do not have the necessary eyesight for driving⁶.

It would be reasonable to expect companies to have processes in place to ensure that their vehicles are being operated by employees with eyesight that meets the legal standard, so it's entirely conceivable that company directors or managers maybe held legally liable for an accident caused by an employee's sub-standard vision where there were insufficient checks in place.

For further details please visit www.oamps.co.uk

¹Fit to Drive: a cost benefit analysis of more frequent eyesight testing for UK drivers, Road Safety Observatory, 2021

²National Eye Health Week, Vision Matters in conjunction with West Mercia Police, 2020, <https://www.visionmatters.org.uk/>

³The DVLA, <https://inews.co.uk/essentials/lifestyle/cars/car-news/more-than-7000-motorists-a-year-stripped-of-their-driving-licence-because-they-cant-see-383655>, 2020

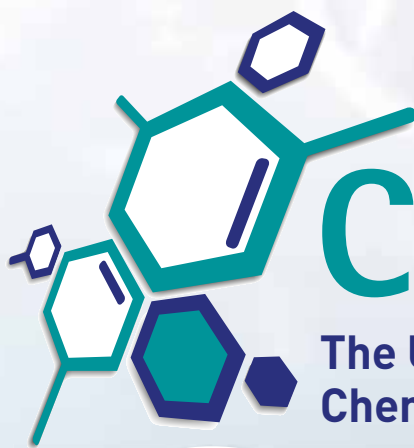
⁴70% of UK drivers say their vision has deteriorated since passing their test, Driving.org, 2021

⁵Health and Safety Executive, Driving and riding safely for work, 2021

⁶Specsavers Corporate Eyecare <https://www.specsavers.co.uk/corporate/news-information/small-business-eyecare-benefits-research>

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The CHEMUK 2022 EXPO records a 15% increase in attendance as it establishes itself as the national trade show for the UK's Chemical Industries

After a tough two years for the events sector, event organiser, UK Industry Events, were delighted to announce that 2811 visitors (excluding exhibitor staff) attended the show over the two days, representing a 15% increase from CHEMUK 2021. The combined two-day attendance, including exhibitors, was recorded at 4044.

Commenting on this year's hugely successful CHEMUK 2022, Ian Stone, MD of UK Industry Events, stated:

"With attendance numbers significantly up again, and with such an incredibly diverse attendance of industry professionals spanning the broad chemicals, chemical products & chemical user-industries, CHEMUK 2022 further reinforced its position as the 'must attend' event for the sector"

CHEMUK presented over 350 exhibitors and a packed speaker programme comprising 180 speakers including a keynote address by Steve Elliott, CEO of the Chemical Industries Association.

CHEMUK 2023 – Floorplan already 80% sold out

CHEMUK 2023 will return next 10th & 11th May at the NEC in Birmingham. The expo will continue to grow through the expansion of the existing 'Chemical, Process & Plant Engineering' and 'Chemical Industries Supply Chain' zones.

In addition, the expo will be launching the 'CHEMLAB' zone that will present specialist exhibiting organisations providing technology and service solutions supporting the R&D, analysis and testing of chemicals and chemical-based products, as well as lab and pilot scale process development.

Ian Stone commented '...by adding the CHEMLAB zone to the existing Chemical, Process & Plant Engineering and Chemical Industries Supply Chain zones, we feel that CHEMUK now fully reflects the complete value chain of the UK's chemical industries'

If you are interested in exhibiting in CHEMUK 2023, please contact the sales team on 0203 829 6060 for latest stand availability.



DATES FOR DIARY:

- CHEMUK 2023 – 10th & 11th May 2023 – NEC, Birmingham
- Free to Attend - Visitor registration opens December 2022
- Further information www.chemicalukexpo.com

Bioplastics – which ones to watch

Conventional plastics, such as polyethylene (PE), polypropylene (PP) and polyethylene terephthalate (PET), are very slow to degrade. Therefore, when these plastics enter the environment as waste they can remain there for decades.

The Organisation for Economic Co-operation and Development (OECD) 2022 report, *Global Plastics Outlook: Policy Scenarios to 2060* says that plastic pollution driven by rising population will increase almost three-fold by 2060 without “radical action to curb demand, increase product lifespans and improve waste management and recyclability”. The organisation’s secretary general, Mathias Cormann, added: “If we want a world that is free of plastic pollution, in line with the ambitions of the United Nations Environment Assembly, we will need to take much more stringent and globally co-ordinated action.”

Solutions to this problem are needed. One possible solution is to replace conventional plastics with plastics that are biodegradable or “bioplastics”.

The main types of bioplastics currently are butylene-based polymers, polylactic acid (PLA), polyhydroxyalkanoates (PHAs) and starch-based bioplastics. At Appleyard Lees we have analysed patent filing trends in these types of bioplastics to identify progress in their development.

Butylene-based polymers

The majority of patent filings for butylene-based bioplastics during the 2000s originated in Japan. However, towards the end of the 2000s patent filings for these polymers became more evenly geographically distributed; a trend which has continued over the past decade. Other jurisdictions experiencing significant filing activity in recent years include South Korea, the US, China and Taiwan.

Overall, the top five filing jurisdictions saw relatively steady numbers of filings relating to butylene-based bioplastics until about 2018, when a sharp upward trend began. The significant increase in innovations relating to butylene-based bioplastics in the last few years may indicate an increased demand from consumers for bioplastics that have similar properties to conventional plastics in areas such as packaging, for example. Butylene-based technology stands out from other types of bioplastics as the leading area of current innovation.

Polylactic acid (PLA)

Again, Japan was the source of the majority of PLA-related patent filings in the early 2000s. However, filings from Japan have declined gradually since about 2008. Other jurisdictions of interest include South Korea and the US, where patent filings around PLA have remained relatively constant over the past 20 years.

Overall patent filings relating to PLA from the top five jurisdictions have shown a steady decline since a peak in about 2008, indicating that companies have moved away from this technology.

Polyhydroxyalkanoates (PHAs)

Japan, Korea and the US have generated the largest numbers of PHA-related patent filings over the last two decades. Filing numbers have notably increased since 2015, suggesting a renewed interest in PHAs.

Starch-based bioplastics

In contrast to the trends seen for the other types of bioplastics, the US has been the biggest source of patent filings relating to starch-based polymers over the past 20 years. Even so, the number of filings per year in the US has fallen since 2014. In other jurisdictions, such as Europe, South Korea and Japan, patent filings have also been lower over the past 10 years than the preceding decade. We could speculate that this signifies a lack of interest – or at least reduced interest – because starch-based bioplastics have poor properties compared to other bioplastics. However, there has been a notable increase in filing numbers since 2017 and it will be interesting to see if this continues as the technology improves.

At Appleyard Lees, we have considerable experience in working with green technologies and last year we published the first edition of our *Inside Green Innovation* report. An extended version of this article will feature in the second edition of our report, due to be published in the coming months.

If you would like advice or information on how to obtain patent protection for your green innovations please contact Kate Hickinson, Partner, Appleyard Lees.



Re-utilising your expertise

I'm often asked by senior candidates who are facing redundancy or organisational change for general careers advice about 'tackling' the market afresh. Although we see these situations regularly in our work as seasoned recruiters, I realise for some individuals it may be the first time they are in this situation. Many can feel quite vulnerable and welcome moral support at the outset, particularly if they have been achievers all their lives and feel unsettled about the potential of a restructure.

Diversity is an important topic, and one element of this is 'level' of experience. Companies can widen their 'pool of talent' by flexing their own perspective on their 'ideal' level of candidate. In my opinion, we need the proven expertise and 'work-maturity' of these experienced candidates in this fast-changing era, when there is fierce competition for professional STEM skills, which will surely increase in the future. Companies are benefitting from acquiring and re-utilising these professional skill-sets.

I've always given my best advice to candidates in these circumstances, urging people to take some breathing space and to sit back and really reflect on what they want, and not take a knee-jerk reaction to any first opportunity in a panic, besides trying to stay positive and clear headed. If possible, to see this as a new phase in life, and an 'opportunity'. To make any career move at any stage in life, it is helpful to reflect first about such points as:

- What are your own strengths and weaknesses (or development needs)? - When have you been most successful or not, in work situations?
- Be truthful to yourself, what really suits you, what do you enjoy doing, what ambition, potential and drive have you really got for change, risk and getting out of your own comfort zone? Most importantly... **What are your core and transferable skills?**
- What type of management style and structure best suits you, what type of manager are you, what culture and size of business do you thrive in?
- What do you really enjoy - working independently or leading a team, influencing an indirect project team, working under high pressure or in a more friendly environment?
- Have you an underlying passion for certain industries or new innovative developments? If so – research the in-demand skills in those sectors and know what transferable skills, you have to offer!
- Think how you need to direct your own career development and gain progression in your next role (and be on track for

any next career goal after that?) - if you want it. Or would you be happier consolidating your skills and contributing well in a new company at a similar level, or even acknowledging to yourself that you would prefer to take a step back to fulfil an interesting professional challenge, or work flexibly, or set up your own consultancy, or consider interim roles.

- **And the big one...Would you really have the courage to take the chance to move into that different emerging arena, when an insightful company can see the potential to invest development in you to adapt and progress your transferable skills?**

RMG knows what top-level talent 'looks like' in any function, we have gained this from our 30 years' experience in the sector. We often introduce individuals with in-demand transferable skills into relevant 'new' industry sectors, ahead of the 'game' before these people are overly active in the general recruitment market. This talent spotting in Chemicals will be an even more crucial aspect of the recruitment sector in the short-medium term, in driving new clean energy requirements. As searching for the 'right' people, needs to be a savvy, proactive and a targeted process and that includes using any exceptional existing skill resources we already have that may be appropriate to retrain and adapt into your company, to help resolve part of the STEM skills-race that has started and is yet to come.

'Your careers advice was insightful guidance on the Hydrogen sector and use of my transferable skills that I wouldn't have considered without your input. The opportunity I have taken is a good fit and in the sweet spot of the hydrogen market – Thank you.'

*Business Development
Manager – NW*



Anita Caldwell

**For further details visit
<https://www.rmg-uk.com/>**



Online boiler and furnace cleaning

Industrial operators are continually looking to integrate best-in-class cleaning technologies that minimize downtime, improve environmental performance and increase production efficiency. ProDecon's latest partnership with Polarchem provides a proprietary online boiler and furnace cleaning solution applicable to the waste-to-energy, power generation, biomass, process and refining sectors.

Key customer benefits include:

Operations & Maintenance

- Safe online cleaning, without shutdown or production modification
- Increase the overall energy efficiency
- Increase availability of the asset

Economical

- Improved heat transfer leading to reduced fuel usage
- Stop unscheduled shutdowns due to deposit build-up
- Reduction of cleaning costs and tube replacements
- Increase the proportion of recycled (class B) biomass = savings on biomass costs

Environment and safety

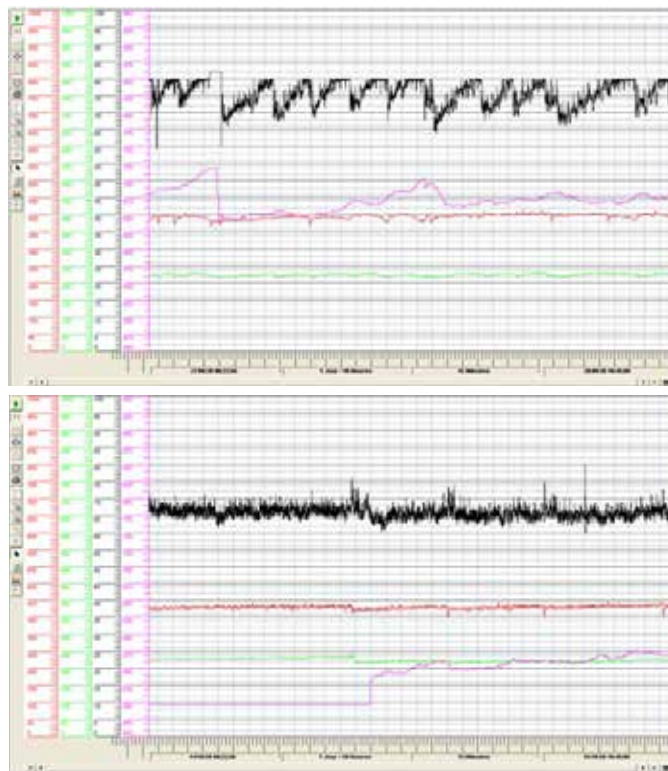
- Improved heat transfer leading to reduced fuel usage reducing overall emissions
- Decrease GHG and dust emissions
- Decrease consumption in exhaust gas treatment products

The process injects a non-hazardous, water soluble and environmentally safe chemical formulation consisting of oxidizing and neutralizing agents that are injected into the convection section to remove the buildup of fouling and slagging. The chemical acts to remove the fouling on the tubes and a dosing regimen can be developed as a preventative measure against scale build-up. The use of Polarchem significantly reduces SO₃ emissions by capturing and converting SO₃ into neutral, non-reactive salts. The deposits are chemically modified which then become dry, friable and easy to remove. Once the formulation has performed onto ash deposits and gases, the reaction products are recovered through the volatile ash filtration system.

Case study

The team's expertise was sought to support a trial at a waste-to-energy plant which drew air by utilizing a fan designed to operate at 65% power. A design issue led to the fan power rapidly rising to 80%, leading to the boiler shutting down for a total clean. This shutdown would happen every quarter, despite the use of micro-explosions twice a quarter. The team's remit was to inject the chemistry for one month when the boiler was already running at roughly 73% and getting worse. As per the below extract from the plants O&M data centre, the left images demonstrate the boiler in the run up to a full clean, which clearly

shows the boiler regularly peaking at 80%, almost all the time. The extract to the right demonstrates post cleaning with the fan power decreasing within days of cleaning.



Following this success, the trial was extended for six months without the plant needing to stop operations; running between 65-67% power as per the plant design, when the plant eventually stopped for a scheduled maintenance.

The team learnt that during the 6-month dosing period of the plant, the client decided to re-start micro-explosions which, prior to our involvement, would typically loosen around 2-300kgs of fouling. After six weeks of Polarchem injections, they made the first micro-explosion and dislodged six tonnes of fouling, providing the plant with great process efficiency and maximizing the plant uptime. This demonstrates how the chemical works to modify the fouling deposits, making them more friable.

The below pictures show the boiler prior to Polarchem injection, and the last picture shows the superheater after injection. The client commented that it was cleaner than they normally achieved on a full shut-down clean.



For further details email sales@prodecon.com

Analytics in Cogeneration, what to measure and why?

Many manufacturing facilities already rely on a cogeneration plant to meet power and steam needs. Cogeneration also plays an increasingly important role in energy security, sustainability and the circular economy. Whether an existing or planned plant, integrating cogeneration adds an additional dependency for production meaning that unplanned downtime can have significant knock-on effects. Managing maintenance cycles and avoiding outages will require data; but what parameters are important and where is best to put them?

Keeping cogeneration running

It is not surprising that production processes get the majority of attention, as that is where profit comes from. However, if a plant's cogeneration facility shuts down, that production stops and the major costs of not producing starts. To avoid unplanned downtime, a minimum set of required on-line water/steam analytics has been developed to ensure that this critical operational plant asset continues to run without interruption.

These recommendations specify what parameters need to be measured and where. This information was developed by the International Association of the Properties of Water and Steam (IAPWS), a non-commercial organisation made up of Industry Experts from 21 different countries.

The recommendations are based on four concepts:

1. The use and placement of the analytics should add the minimum level of instrumentation to be able to uniquely identify and pinpoint the causes of all possible major water/steam/chemistry related failure or damage mechanism.
2. There should be an adequate level of redundancy, enabling the entire boiler-steam cycle to be monitored holistically, so that in the event of a defective or out of service instrument, proper control and management can continue.
3. The minimum level of online instrumentation should provide assurance to the operator that they can trust the results, without having to double check an instrument or take a grab sample.
4. Audible alarms from these analytics should be triggered in the control room and/or fed through the DCS system so that in the case of an upset, key personnel are quickly notified and action taken before damage occurs.

Below is a list of required and optional water/steam analytics. Make-up water

- Conductivity: Upstream of the point of mixing with the dosed condensate.
- Cation conductivity: Upstream of the point of delivery of the water into the main boiler circuit.
- Silica: If the plant's source water is high in silica and/or the treatment plant has difficulty in removing it.
- TOC: If the source/raw water has high levels of organics.

Condensate

- Cation conductivity: To detect rapid ingress of corrosive ions.
- Sodium: Required for seawater-cooled plants, especially if condensate polishing is not used. This is also because

sodium measurement is much more sensitive than conductivity for quickly detecting condenser leaks.

- Dissolved oxygen: Detects air in-leakage into the high-pressure part of the cycle.
- TOC: Highly recommended at sites that have a high risk of the steam/water returning contamination from the production process.

Boiler feedwater

- pH: For continuous control of the pH set point.
- Conductivity: Gives a rapid indication of dosing levels of the chemicals being added to optimise the pH.
- Cation conductivity: Confirms that no contaminants have entered with the ammonia/phosphate/caustic dosing or via another route such as a condenser leak.
- Dissolved oxygen: If required, to check that the oxygen level is within the target range to minimise corrosion.
- ORP: Necessary if there are copper alloys in the feedwater circuit to monitor copper corrosion.

Drum boiler/HRSO evaporator

- Conductivity and cation conductivity: Essential for monitoring the boiler downcomer and in plants running an all-volatile or caustic treatment.
- If the plant adds phosphate to the boiler, then in addition to the requirements above, the on-line measurement of phosphate is necessary for an unambiguous control of the dosing and to prevent phosphate hideout.

Steam sampling (measured in the liquid phase)

- Cation conductivity, sodium, silica: Minimum requirements.
- Degassed cation conductivity: Optional if there is an elevated risk of air in-leakage or CO₂ absorption when the purified water is in storage.

By establishing, monitoring and taking action on these minimum required analytic measurement points, corrosion and the formation of deposits will be minimised in the boiler steam cycle. Water and chemical upsets are rapidly detected and can be quickly responded to, resulting in the cogeneration plant experiencing a safe, reliable and long life.

Learn more at www.mt.com/pro-power
Ewan Jones, UK Chemical Industry Specialist - Process Analytics - Mettler-Toledo Ltd
Mobile +44 7831 255187

Source: International Association for the Properties of Water and Steam, Technical Guidance Document: Instrumentation for monitoring and control of cycle chemistry for the steam-water circuits of fossil-fired and combined cycle



Expanding the growth of your company using language translation services for exports

A recent university study has proven that organisations using translation services are 30% more successful in exporting goods than those who do not, and we can see why!

Exporting goods is one of the best ways to expand your business and create an international presence, but the language barrier can be a crucial area of concern when considering the logistics of the expansion. A professional translation company can take care of all the associated language requirements to begin exporting and help facilitate the company's growth.

A large part of the success will be attributed to building strong business relations with overseas businesspeople to receive a healthy demand for the goods you are seeking to export. There is a risk of miscommunication between parties if you are not fluent in their language, which could lead to a misunderstanding in sales and a possible breakdown of relationship. However, a translation company that offers interpretation services can mediate in all business meetings to ensure all parties fully understand what is being negotiated.

In addition, professional translation capabilities can help to ensure that the company's goods, including packaging and labelling, are accurately represented in other languages, which will help to boost sales and growth. This is essential not only for direct translations, but also in understanding the localisation of the language, thereby ensuring there

is no unintentional meaning when the text is translated into the desired language that would cause offence and a decline in sales. This is also the case for developing marketing materials targeted at that specific country, which is a vital consideration, as cultural differences can impact how a product is perceived. Not correctly translating marketing materials can create confusion or even offend potential customers.

Another aspect of exportation that requires precise accuracy is knowledge of the region's industry regulations. A professional translation company will have linguists that specialise in your industry and will know if the country you're exporting to has specific additional rules that you must comply with.

Professional services can also help ensure that a company's website and other online materials are properly translated into the correct language. This is important, not only for customer service, but also for search engine optimisation (SEO). If a company's website is not translated correctly, potential customers in other countries will likely be unable to find your business.

Overall, a professional translation company can help an organisation expand its growth by ensuring that the products or services are appropriately translated and can effectively communicate with its target audience.

For support exporting your goods, contact TW Languages through chemicaltranslations@twlanguages.com



Patenting research outputs – managing your finances

Before making the leap into patent law as part of WP Thompson’s chemical and life sciences team, Dr Ian Wilson worked and studied in academia for over a decade. In our continuing series, Ian investigates the key financial considerations for researchers as they seek patent protection for their inventions.

The costs associated with a patent across its lifetime – from the initial drafting and filing to payment of maintenance fees up to 20 years later – can be considerable. As such, researchers contemplating seeking patent protection for an invention should carefully consider the likely monetary value of that invention in the short-, medium- and long-term, in order to establish a strategy for maximising the value of their intellectual property protection.

Know the competition

The time and expense involved in drafting a patent application vary based on the discipline and/or complexity of the invention. It is therefore worthwhile gaining some indicator of the likelihood of success before starting out. For example, freedom-to-operate searches seek to establish whether there are other patents or patent applications that may be an impediment to your proposed activities. Meanwhile, prior art searches look more broadly at published documents to identify any existing disclosures that might destroy some or all of an invention’s claims to novelty and inventiveness. Incurring relatively low costs, these searches can provide peace of mind, help minimise the risks of refusal or infringement, or simply minimise expenses incurred in the event that an application is deemed not worth pursuing.

Know the markets

As we discussed in the Summer 2022 edition of Elements, applicants must eventually decide in which countries and regions they wish to seek patent protection for their invention. Of course, each country or region in which protection is sought will come with its own costs, amplifying the financial risks associated with a single invention’s IP rights and the number of fiscal decisions to be made. Researchers considering patenting their inventions may therefore benefit from conducting market research to identify in which countries a granted patent is likely to generate the most

revenue in the short-, medium- and long-term. Beyond this, knowing the markets of interest can help applicants identify to which patent offices they wish to submit their patent application. For example, an inventor whose product is only likely to sell well in Germany may choose to file directly at the German Patent Office, whilst an inventor with a product that has pan-European appeal may prefer the more cost-effective centralised examination process provided by the European Patent Office rather than paying examination fees in every country of interest.

Stick or twist

In any single country, applicants or proprietors have the option of abandoning their application or patent at almost any stage from the moment they file an application to the final day of a granted patent’s 20-year lifespan. During the search and examination stage, this allows applicants to abandon an application if costs are building more than anticipated, perhaps due to a protracted dialogue with the examiner or an unfavourable search opinion. Post-grant, this importantly means that proprietors are not obliged to pay ongoing renewal fees. This allows proprietors to adapt to market fluctuations and maximise their profits, or to simply wind down a patent, as planned, at the end of a product’s lifespan.

Portfolio strategies

Questions regarding whether to pursue an application or continue maintaining a granted patent should therefore be regularly considered by their proprietor. This becomes particularly important once multiple applications or patents are owned across multiple jurisdictions. For example, funds tied up in applications for, or maintenance of, relatively low-value patents may need to be released to fund a patent application for a high-value flagship invention. Alternatively, it may be that licencing out the rights to work an invention, or to sell the rights to an application or patent, are more financially beneficial. As such, many large companies have monthly portfolio reviews to discuss such topics. However, even researchers taking their first steps in the world of IP should consider adopting a review strategy for their own burgeoning portfolio. As we have said time and again, preparation is key in the patent field.

To find out more, including how IP could benefit your work, please visit <https://www.wpt.co.uk> or contact Stuart Forrest at sfo@wpt.co.uk

How the right lubricant can improve energy efficiency

Today's manufacturers are being tasked with being more corporately responsible and sustainable, which means being more energy efficient, adopting best practices and investing in energy-efficient processes, but to do this requires overcoming the biggest enemy of efficiency – friction.

According to the article "Global impact of friction on energy consumption, economy and environment" published in FME Transactions, a peer reviewed, open access journal on mechanical engineering, 100 million terajoules are needed annually worldwide just to overcome this friction¹. However, improved-technology lubricating oil can significantly boost efficiency by reducing friction and thus minimize wear.

The chemical industry, including petrochemicals, is a top greenhouse gas (GHG) emitter, contributing approximately 20 percent of the world's GHG total² but just as mineral oils in the automotive industry have been replaced with synthetic types, specialty lubricants and meticulous monitoring can also benefit industrial applications found in the chemical industry such as compressors, gearboxes, heat-transfer systems, and exchangers.

Our multi-step approach includes Energy Consulting, Energy Measurement, Energy Analysis and Reporting which can help the Chemical Industry increase process efficiency and demonstrate operational energy savings. The relevant results such as cost savings, CO2 emissions, ROI, and energy consumption are presented in a clear, understandable way and savings can be quantified according to ISO 50015 and IPMVP* to support energy management systems for example ISO 50001.

Compressors

Air, gas, and refrigeration compressors are found in many chemical processes, often operating under severe conditions, but poor lubricant choice can directly impact both compressor reliability and efficiency, possibly causing a catastrophic failure. With gas compressors, the situation is particularly critical as compressor oils can react with process gases or attack downstream catalysts, causing production issues.

Klüber Lubrication has a full range of **Klüber Summit** compressor oils, whatever your compressor technology type that offer good viscosity vs temperature behaviour and high resistance to oxidation.

Gearboxes

Chemical industry gearboxes are found within reactor agitators, mixers, extruders, conveyors, grinding mills, centrifuges, cooling towers, bucket elevators, rotary driers/coolers and other rotating equipment. They are designed

to transfer power from an electric motor to equipment in motion, and lubrication can directly influence their efficiency. Polyglycols (PAG) based lubricants offer the best energy efficiency, longest service life and highest wear protection.

Our **Klübersynth GH 6** product family of PAG based lubricants outperform all other synthetic base oils particularly in high-sliding applications such as worm and hypoid gears as the lower coefficient of PAG oils reduces friction within the gearboxes resulting in lower operating temperature and reduced power loss.

Keeping your equipment clean to maintain efficiency

Many chemical enterprises still use mineral oils in most of their severe and heavy-duty applications but pushing mineral oils to their performance and service life limits will most probably lead to varnish and carbon build-up in the entire equipment or circulation system. These sticky residues will cause higher energy consumption, stuck valves, overheating, clogged oil lines and filters, and increased downtime due to maintenance.

Klüber Summit Varnasolv is a concentrated conditioner fluid that acts like a detergent/dispersant to dissolve varnish and carbon deposits during operation in various equipment items, with no dismantling needed. It is miscible with mineral oils, synthetic hydrocarbons, ester oils and polyglycols. The product can also recondition and restore efficiency in oil heat transfer systems that have accumulated a hard deposit, known as fluid coking on piping inner surfaces. If not eliminated, fluid coking can decrease system heat transfer coefficients, increase energy consumption, exhaust gas temperature, and even block pipelines that can lead to fires and explosion hazards.

Challenges faced by the Chemical Industry

As many chemical enterprises juggle choices regarding carbon footprint and limited production capacity, they can choose to add new production lines and pay accordingly or improve their process efficiencies. Sometimes, customers decide to use the improved energy efficiencies realized by our specialty lubricants to increase production rather than reduce energy demand, but whatever your energy efficiency ambition or business objective our application knowledge combined with our specialty lubricants is the winning recipe to improve your process efficiency and reliability. Contact us for a free technical consultation

For further details visit <https://www.klueber.com/uk/en/>

References

¹Global impact of friction on energy consumption, economy and environment, FME transactions, K. Holmberg, A. Erdemir, 2015.

²Global Efficiency Intelligence, Infographic: Chemical Industry's Energy Use and Emissions, Ali Hasanbeigi, November 11, 2018

* IPMVP: International Performance Measurement and Verification Protocol

Clamp-on ultrasonic flowmeter technology is a breath of fresh air

Non-invasive, clamp-on ultrasonic flow metering is proving to be a highly accurate measuring tool for high pressure oxygen in the petrochemical setting. Able to measure gases at temperatures over 100° C, ultrasonic technology uses sound waves to measure the flow of oxygen within the pipe. Alternating between transmitting and receiving pulses of ultrasound waves between two transducers, the flowmeter can accurately determine the flow rate.

FLEXIM was tasked with the retrofit of billing meters for oxygen at the world's largest oxygen production site in Secunda, South Africa. A recent restructuring had meant that two companies would need to be able to bill each other for products and utilities across a common site, but there was no metering currently in place. The oxygen plant had previously been integrated within the chemical complex and was part of an internal system that previously required no metering.

Because of the large volumes traded, metering accuracy, reliability and repeatability were essential to both parties. A four channel meter was the solution, offering the best possible performance via non-intrusive measurement. The plant was large and complex, with numerous measuring points to be monitored, not least of which were the high temperature oxygen lines and headers, with temperatures ranging from 110 to 120° C. The pipes were over 40 years old, and despite having been insulated were showing their age, with signs of rust and corrosion on the surface.

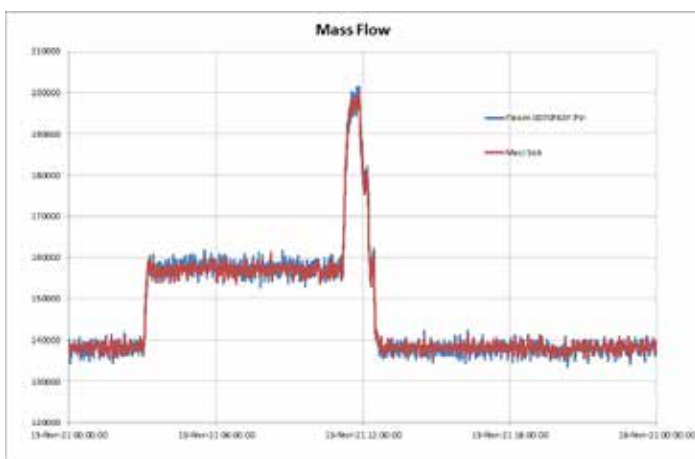
Avoiding a costly shutdown

In order to install a traditional metering system, a factory shutdown would be needed. This simply wasn't a feasible option, because of the associated high costs and long execution timing. So, to avoid this situation, it was agreed that a benchmarking test would be carried out to compare ultrasonic technology to a wetted multi-path custody transfer flowmeter installed on an Air Separation Unit. The tests were successfully undertaken and the commissioning was executed with no interruption whatsoever to the normal plant operations, in full compliance with safety and COVID-19 protocols.

The quad beam meter was permanently installed, in parallel with a custody system

Chosen for its adaptability to both high and low temperature oxygen measurement, the quad beam meter also offers the benefit of increased accuracy thanks to the averaging of multiple sound paths, even where there are less than ideal inlet conditions. And because of the inbuilt flow computer, complexity and cost are reduced, with simultaneous reporting of both flow and diagnostic data achieved via the Modbus protocol. Special care had to be taken in making sure the specific grade of steel and resultant speed of sound was used, in order to achieve the maximum accuracy possible.

For more information on the benefits of non-invasive ultrasonic flow measurement of oxygen in the chemical industry, contact Simon Millington - www.flexim.co.uk sales@flexim.co.uk or call +44 (0)1606 781 420.



Axiom looks back at 2022

2022 was the year for businesses across the North West of England to become stronger together in this post-Covid era whilst adapting to continuous change. Facing a challenging economic environment including rising inflation and interest rates, North West businesses continue to dig deep and are not simply willing to survive but to thrive.

Although Axiom's head office is based in Stockton-on-Tees, its localisation strategy to establish regional presences in key Chemical and Process sector hubs led to the opening of another new office at one of the UK's leading independently-owned business and technical parks. Based in a central location in Runcorn, an office at The Heath Business and Technical Park was opened back in 2020 and continues to serve as the focal point for Axiom's service delivery operations across the North West.

This strong asset integrity management support was formally recognised as Axiom were named "Supplier to the Chemical Industry 2022" at the Chemicals Northwest Annual Awards Dinner 2022 held in March. This award was made to a Chemicals Northwest member who was able to demonstrate how their products or services have successfully responded to a customer problem and helped deliver effective supply partnerships. Axiom later repeated their success at the national Chemical Industries Associations (CIA) awards in June, securing the accolade of "Chemical Industry Service Provider of the Year" in recognition of Axiom's innovative technologies driving improved, data-driven integrity management assurance to

the Chemical industry during this period of unprecedented challenge.

Challenges continue as the drive towards achieving Net Zero by 2050 accelerates and the major industrial hubs such as the North West push ahead with the development and implementation of renewable energy and carbon capture schemes. Axiom continues to demonstrate in-depth hydrogen sector skills and knowledge, and is ideally-placed to advise on mechanical design, process safety and materials engineering. With additional blue hydrogen production already planned in key Chemical hubs across the UK, Axiom is ready and able to step up as an experienced industry partner, who can deliver the localised expertise needed to progress these initiatives.

Axiom's contribution during 2022 to the North West supports the continued growth and success of both the area and the UK economy as a whole. Recent challenges and taught us all that agility to change and adapt quickly to the new environment is paramount. We believe that our dynamic and innovative approach to technologies and working closely with our partners in the North West, we will continue to differentiate ourselves from our competitors through our integrated offerings, creating value for both our clients and wider stakeholders.

As we look towards 2023, Axiom's financial performance continues to demonstrate steady growth, testimony to its capability to not only deliver effective lifecycle integrity management systems to its clients but to undoubtedly thrive.

For further details visit

<https://www.axiomengineeringassociates.com/>



Your roadmap for innovation improvement

There are good reasons to want to improve innovation capacity. The financial ones are driving top-line growth and bottom-line returns to investors and investor attractiveness. Better innovation capability means better responding to trends and drivers, to the crises and opportunities surrounding us delivering more valuable products and solutions that customers want. And, the softer benefits, makes the organisation a more attractive place to work in a talent-stretched environment.

I'm working with more organisations that want to improve and a common characteristic is having both the need and the want factors in place. A switched-on strategic intent, what you might call ambition needs to be present because any journey of improvement is potentially long and difficult. Related to the want factors, are the needs; to want a level of growth a market demand and new technology responses to drive efficiencies or build train-blazing new solutions.

A Process for Innovation Improvement

In my work with technology-intensive firms, it can be unclear where to start and how to progress. Assuming that the senior team has had the Ambition Conversation and understands Why it wants or needs to improve innovation capacity, I recommend we start with a solid assessment of the current situation. I've written here about the importance of the innovation system before as a foundation of high performance. I like to combine a framework for the assessment of the innovation management system with in-depth interviews to develop a prioritised agenda of improvement.

Next, go to work! We need to show and demonstrate new and real value. Take one or two topics that are on your short-term innovation agenda selecting them carefully for impact. These could be new products, services or solutions that harness and extend your capabilities into the future. Apart from new revenue and ROI, the spin-off benefits will be more business resilience and productivity and generate even more future options.

In practice what does this phase look like? Taking an important and high-potential area, bring together your best team to be part of a designed and facilitated process. Carefully select and deploy your innovation toolkits – for example, ecosystem mapping, strategic roadmapping and make v buy analysis. This gives you a solid basis for communicating your story about new value streams and securing the investment.

Finally, embed the necessary changes and enablers. Evaluate the organisational aspects and the change management. Because we want to do things differently and exercise innovation muscle.

Cases

One global materials organisation wanted to make a step change to its ranking in its sector. Imperatives for change included tightening raw materials supply and new technologies including digitalisation and climate change regulation. By carefully designing a process like the one above, they gained clarity about the Why, What, How and When.

A discrete manufactured goods company had growth ambitions but was constrained by its innovation capacity to identify, design and launch breakthrough products and services. Innovation capability was needed in digitalisation and servitisation. Running through the innovation improvement cycle, new solutions and capabilities were identified, giving confidence and evidence of the new capacities needed. This innovation improvement process cut short the strategic deliberation by several years.

Want to know more?

Rob Munro is an advisor to the leadership team in technology-intensive situations including the process industries. Please contact him to discuss your strategic innovation planning and capability building.



Visit <https://innovation-success.com/>
Email rob.munro@innovation-success.com



INNOVATION

Celebrating high hazard industry success

Significant Milestone Reached - 20,000 Staff Trained in Process Safety Management Celebrating High Hazard Industry Success – BUT more sites still need to adopt the standards!

Responsible process safety training success has been achieved by over 300 UK and global high hazard companies, celebrating the fact that since 2010, 20,000 delegates have now adopted the Process Safety Management (PSM) industry framework training standards.

The standards, listed in this HSE COMAH guidance document - have been developed for industry by the UK Process Safety Management Competence Programme (PSM CP) Board, which includes representatives from the Health and Safety Executive, and are delivered exclusively by Cogent Skills.

The PSM standards are benchmarked to COMAH / SEVESO III compliance requirements and include detailed content supporting process safety competence and compliance - to help improve a business' operational integrity, safety and reduce the risk of a Major Accident Hazard to people, assets and the environment.

Since the start of the programme, training has been undertaken by 20,000 PSM delegates from over 40 major accident hazard industry sectors – including Chemicals, Nuclear, Energy, Utilities, Manufacturing, Upstream and Downstream Petroleum, Explosives, Distribution and Storage, across the following COMAH site classifications:

- 36% Upper Tier
- 15% Lower Tier
- 49% Non-COMAH

This significant milestone was reached in Summer 2022, when participants from Atomic Weapons Establishment (AWE Plc) undertook a bespoke Process Safety Leadership course, delivered via online blended learning.

This means that since 2010, high hazard industry leaders have been investing in their staff training and process safety culture - to keep their sites safe and reduce the risk of a catastrophic incident to people, the environment or assets - which in turn will help them to keep their 'License to Operate'.

But there is still more to do. There are over 900 COMAH sites in UK and only 1/3rd of COMAH and non-COMAH high hazard sites have adopted the PSM Training Standards.

Richard Roff, Chair of UK Process Safety Management Competence Programme Board and Group Process Safety Director, Costain Group PLC, stated:

“This significant milestone demonstrates the importance that responsible senior leaders place on process safety management across their businesses. It should also send a clear message to those yet to engage in process safety management training, that they are missing out on something their peers or competitors have in hand.

The principles of Process Safety Management are applicable wherever there is a need to maintain operational safety and reduce environmental risk so it's great to see that non-COMAH organisations are taking their process safety seriously too.

It's essential that leaders of organisations with the potential for catastrophic incidents in their operations prioritise the adoption of process safety education: The PSM programme's standards have been developed specifically for them and their teams - to help keep their operations safe.”

The Process Safety Management training standards are delivered via a suite of 1-2 day Process Safety Management courses, including:

- **Process Safety Leadership for Senior Executives (PSL)** for Senior Executives and Board Members of major hazard facilities
- **Process Safety Management Foundations (PSMF)** for Managers, Supervisors, Safety Personnel, Senior Contract Employees and Junior Engineers
- **Process Safety Management for Operations (PSMO)** for Operators, Maintenance Technicians and Long-Term Contractors
- **PSMO - Train the Trainer** (License to Train PSMO)

Amanda Cockton, PSM CP Board member and Health and Safety Executive HM Inspector of Health and Safety | Chemicals, Explosives & Microbiological Hazards Division, stated:

“2021 major hazard leadership interventions highlighted the links between poor performance on site and a lack of competency in the management of major hazards at senior leadership level.

Boards should have at least one person who is accountable for process safety performance and who understands how the decisions made at board level can impact upon safety, both now and into the future.

Process Safety Leadership training is an effective way of ensuring that these boards have the right level of competency.

Any senior leader, who plays a significant role in the direction of a business, needs to understand not only what is happening on their sites and appreciate their risk profile, but they should also take accountability for their process safety management systems, workforce competency and major hazard safety on site.

This is particularly important now, as leaders make plans to review and update their sites in preparation for Net Zero.”

Visit <https://www.cogentskills.solutions/> for further details



Klüber

Maximum processes safety with optimized lubrication

In the chemical industry the demand for speciality lubricants continues to increase due to higher demands on processes and the extreme conditions involved. Conventional lubricants can become dangerous when exposed to oxygen, aggressive or cryogenic environments, but our speciality lubricants have a positive impact on plant safety by resisting high temperatures and corrosive or solvent media.

The right lubricants for the right application

By helping our customers select the right lubricant for the right application it is possible to extend the service life of components and support plant availability/uptime and reduce maintenance times for Gas compressors, air compressors, fasteners used on flanges, ball valves, pump bearings, mechanical seals, and gear boxes.

World Class Lubrication

Klüber Lubrication aim to manage lubrication for their customers. This includes a site wide overview with all lubrication points mapped and assessed by our experienced engineers. The focus is long term asset reliability and operational efficiency. Our World Class Lubrication program is geared

towards autonomous maintenance, increased efficiencies, lower operating costs, a reduction in emissions, lower consumption of cleaning agents and less lubricant wastage.

Investing in energy efficient lubricants

As energy costs continue to rise the emphasis on reducing costs is paramount, which means being more energy efficient, adopting best practices and investing in energy-efficient products. Using a Klüber Lubrication energy efficient lubricant can result in typical 5-10% energy savings across many applications typically gearboxes and compressors. Unlike other lubricant manufacturers that claim to have energy efficient products we measure and prove.



Contact:

Main Contact: Matthew Cloran
Area Sales Manager – North West Region

E: matthew.cloran@uk.klueber.com

T: 07542 027577

W: www.klueber.com/uk/en

Office

Klüber Lubrication Great Britain Limited
Pennine Business Park
Unit 10 Longbow Close
Bradley
Huddersfield
West Yorkshire
HD2 1GQ

LinkedIn:

https://www.linkedin.com/company/klueber-lubrication_102925/

YouTube:

https://www.youtube.com/results?search_query=klueber+lubrication

Glacier

With a track record spanning over 80 years, Glacier Energy has extensive experience in the design, manufacture, and repair/refurbishment of heat exchangers and pressure vessels. Operating internationally, we are at the forefront of innovative and effective heat transfer products, with a strong focus on managing energy efficiency.

We offer a full turnkey service comprising the design, manufacture, repair and maintenance of heat transfer equipment, including full failure analysis to help restore assets to optimal working condition, saving significant time and money. Furthermore, we provide standardised off-the-shelf equipment, pioneering & bespoke new-build solutions and the reverse engineering for obsolete units, to meet exact technical specifications.

We have a purpose-built design and manufacturing facility equipped with a comprehensive array of advanced equipment. This allows us to fabricate equipment up to 200 tonnes, enabling

us to meet all tasks associated with the manufacture and repair of heat exchangers and pressure vessels.

In addition to our design and manufacturing expertise, we offer a complete aftermarket support service, including the provision of spares. All our systems are designed to our clients' specific requirements and can be manufactured using a variety of materials including stainless steel, carbon steel & exotic metals.

In support of achieving net-zero and aligned by a joint vision, we are dedicated to providing our clients with more efficient, reliable and sustainable heat transfer solutions. As a trusted partner with a strong track record, we operate within the Hydrogen, CCUS, Circular Economy, Waste to Energy and Energy Storage Industries. Currently, we are proud to be supporting several companies from FEED to delivery for Circular Economy, CCUS and Hydrogen projects.



Contact:

Main Contact: Shiva Afraste
Key Account Manager

E: shiva.afraste@glacierenergy.com

T: +44 (0)1224 515517

W: www.glacierenergy.com

Office

Unit 3, Peterseat Drive,
Alten's Industrial Estate,
Aberdeen
AB12 3HT

LinkedIn:

[Glacier-Energy](#)

Mathys & Squire LLP

Mathys & Squire LLP is a full-service intellectual property firm with industry-leading expertise in patents, trade marks, design protection and IP litigation that operates across all technology fields. We have a dedicated chemistry team of highly experienced attorneys holding higher degrees and research or industrial experience. We are passionate about innovation in the chemical field and bring our in-depth technical knowledge to bear in the work we do in advising our clients.

We understand the global importance around a green agenda for big business and that many leading companies are rising to the challenge. In a sector that demands constant innovation, we have a strong record of assisting companies in obtaining protection for their intellectual property in the UK and overseas which is critical to their growth, particularly in connection with green chemistry. Our chemistry and cleantech expertise spans multiple areas including the development of new biofuels, water treatment technologies, renewable

energy solutions, green solvents, renewable polymers and composites, and numerous other environmentally friendly solutions. We regularly assist clients in fast-tracking their patent applications before the UKIPO using the Green Channel.

Our chemistry team is also particularly experienced in collaborating across technical specialisms, allowing us to harness the full range of technical expertise across the firm to handle hybrid technologies effectively, without duplicating costs for our clients.

We work with a varied client base, including multinational corporations, SMEs, start-ups, spin-outs, and universities and we are able to apply our expertise in a tailored manner. Our Scaleup Quarter offering provides strategic advice to start-ups and scale-ups and our sister company, Mathys Consulting, provides IP valuation services and expertise that can be invaluable for securing investment.



Contact:

Main Contact: Michael Stott
Partner

E: mjstott@mathys-squire.com

T: 020 7830 0000

W: www.mathys-squire.com/

Office

The Shard,
32 London Bridge Street,
London
SE1 9SG

Linkedin:

<https://uk.linkedin.com/company/mathys-&-squire-llp>

Facebook:

<https://www.facebook.com/Mathys-Squire-100154715585677/>

Twitter:

https://twitter.com/Mathys_Squire



Did you know that the UK Intellectual Property Office (UKIPO) offers a free scheme to speed up prosecution and grant of patent applications to environmentally friendly technology?

The UKIPO's 'Green Channel' allows applicants to request accelerated processing of a patent application. No official fees are required and all that the applicant must do is make a reasonable assertion to the UKIPO explaining the invention's environmental benefits. The criteria for what the UKIPO will consider to be an environmental benefit is relatively generous. Even relatively subtle environmental benefits, such as increasing overall energy efficiency or reducing environmentally unfriendly by-products of a known process, are often sufficient. Indeed, applications to the 'Green Channel' appear to be mostly refused when they are very clearly unfounded (the example given by the UKIPO is claiming a perpetual motion machine).

In our experience, use of the 'Green Channel' can speed up the grant of a patent to under two years, which is much faster than the three to four years that applicants might usually expect. This can be particularly useful to applicants who wish to have rights granted in the UK to leverage as soon as possible – whether to deter potential infringers, negotiate more favourable licensing terms, assist a company's asset valuation, or to attract external investment – whilst obtaining patent protection overseas on a slower track, to help manage costs.

Additionally, the UKIPO publishes a list of patent applications successfully entered into the 'Green Channel'. Having an official UKIPO endorsement of your invention's green credentials may help showcase your business's environmental prowess and validate your company's green agenda.

Supplying to the Chemical Industry

Knowing your local supply chains is important, and suppliers of expertise, solutions and great products are right here in the northwest. CNW members have a strong association with and many years of experience supplying to the chemical industry. The companies listed in this directory cover a wide range of products and services. They have established customers in the sector, with proven track records. Many will be well known, long-standing firms and there will also be new and innovative businesses that you may not have heard about. Effective supply partnerships, delivering success for all! For more details, the websites for the listed companies and organisations can be found at:

<https://www.cia.org.uk/chemicalsnorthwest/Membership/Our-Members/>

Chemicals Distribution, logistics & chemical handling

2M Holdings Ltd

Chemical distribution and related services of sample management, storage and blending. Provision of AdBlue, Samsol products, packed chlorine and TRIKLONE & PERKLONE chlorinated solvents. Markets served include: automotive, precision cleaning, coating, oilfield & refineries, flavours, fragrances, surfactants for personal care, household and industrial cleaning and pharmaceuticals.

Actikem Ltd

An ISO9001 certified business, specialising in a range of chemical processes and manufacturing services, including mixing, storage and re-packaging. We provide toll and custom manufacturing services for SMEs as well as blue-chip organisations, and supply customers with on-tap production facilities, offering them potential cost-savings and greater flexibility.

F2 Chemicals Ltd

As a specialist in the handling of fluorine gas, F2 Chemicals Ltd offers a variety of organofluorine products all manufactured at our Preston plant. Our primary product is a range of high specification perfluorocarbons, such as octafluoropropane and perfluorodecalin, under the Flutec tradename, used in applications including medical, tracers, plasma-cleaning, cooling and cosmetics.

Hosokawa Micron Ltd

Integrated powder processing technologies including: size reduction, air classification, mixing, drying, containment equipment such as gloveboxes and downflow booths. Contract processing services for 1kg to multi-tonne lots. Remote monitoring solutions that include: condition monitoring, analytics for improving product quality and energy efficiency and on-line diagnostics for predictive maintenance and improved plant availability.

Itac

Itac specialise in developing high performance solvent-based adhesives and coatings. We design and manufacture bespoke adhesives and coatings formulations, enabling our customers to develop market leading products critical to countless end use applications. Itac also provide confidential toll manufacturing services allowing our clients to focus on their business objectives.

Kanon Liquid Handling Ltd

Design and manufacture of drum, IBC and container filling systems ranging from fully automated robotic systems to simple manual machines. Full range of marine, road and rail tanker loading/unloading and safe access equipment. Distributor for Mann-Tek couplings, with repair facility and 'return to base' option.

Klüber

Global manufacturer of over 2500 speciality lubricants for virtually every industry, Klüber Lubrication high-performance speciality lubricants and effective lubrication management programs enable customers to achieve their operational efficiency goals, increase reliability, and lower the total cost of ownership across assets.

Suez Water Technologies and Solutions

Suez Water Technologies and Solutions is one of the world's leading providers of water treatment chemicals, services and equipment. Through focussing on customer service, value delivery and research and development of new products, we have been instrumental in helping our customers overcome the world's toughest water and process challenges.

Education, training & skills

All About STEM

Lots of different projects to bring exciting Science, Technology, Engineering and Mathematics to schools across the region, linking them with business and industry expert volunteers inspiring the next generation of STEM specialists. Building and maintaining relationships with our schools, businesses, industry, colleges and universities so that we can strategically match-make opportunities with need.

Catalyst Science Discovery Centre

An independent charitable trust playing a pivotal role in promoting science across the Northwest. Catalyst works in conjunction with industry partners to excite young people about all STEM subjects and careers available within the science sector. Companies can also sponsor a local school to visit and attend industry days.

Centre for Industry Education Collaboration

CIEC supports companies in making credible and sustainable links with primary schools, in order to inspire the next generation of scientists and engineers. We train STEM professionals to improve their communication skills, and develop industry-focused activities for use directly by teachers or by ambassadors visiting schools.

Chemistry with Cabbage

We work with students of all ages, demonstrating through practical experiments, the relevance of chemistry in solving problems. Research shows that children make career choices very early on, so capturing their imagination early is important. Chemical companies are welcome to support our hands-on work in primary schools.

EngineeringUK

Not-for-profit organisation promoting the contribution made by engineers to society. We partner business and industry, government and the wider science & engineering community, producing evidence of the state of engineering. Sharing of knowledge and inspiring young people to choose a career in engineering.

Lancaster University

Lancaster University's award-winning partnerships and engagement team facilitates business collaborations, including student placements, access to over £45m scientific facilities, training, contract research, and multi-partner collaborative research projects. We liaise with all areas of the chemical industry, from multinational oil, chemical and pharmaceutical companies, to SMEs producing new and specialised products.

SEERIH

The Science & Engineering Education Research and Innovation Hub positively influences the experience of young people in science and engineering. Expertise in curriculum and teacher development, applied research and creation of innovative projects related to primary science and associated STEM disciplines. Inspiring excellence in teaching and learning in science education.

The Outward Bound Trust

An educational charity that uses the outdoors to help develop young people. Experts in the development of early talent and specialising in providing experiential learning and development programmes for apprentices and graduates. Identification, development and change of people behaviours in line with organisational needs.

TTE Training Ltd

Engineering training and apprenticeships focused on whole person development and bridging the sector's skills gap. The learning environment will be one which is welcoming, safe and inspiring, appropriate to the subjects and responsive to the needs of the learner.

Warrington & Vale Royal College

Delivering vocational, professional and apprenticeship qualifications across science and engineering. Home to a new Advanced Manufacturing & Engineering Training (AMET) centre and dedicated science laboratories. Continually building relationships with schools, businesses and industry to help bridge the skills gap. Bespoke course and packages available. www.wvr.ac.uk

Wirral Met College

Provision of education and training, supporting innovation and development. The College is pioneering SIP traineeship programmes with local employers, preparing young people for science apprenticeships. New STEM Centre opened in 2016.

Engineering products & services

Addison Project

Addison Project is a Multi-Disciplined Engineering Project Management & Design organisation, established in 1997, with offices located in Cheshire, Lancashire and Teesside. We have an in-house team of engineers and designers circa 130 people, catering for mechanical, civil, structural, EC&I, process engineering and a full range of CDM services.

Beamex

Beamex helps its customers to find a better way to calibrate, according to the most demanding requirements of process instrumentation. Beamex offers a comprehensive range of products and services – from portable calibrators to workstations, calibration accessories, calibration software, industry-specific solutions and professional services.

continued overleaf

Know your supply chains

CDR Pumps UK

A leading independent Pump manufacturer. Since opening our doors 60 years ago, we have gone from strength to strength bringing you a company that has the product, service and knowledge to support the chemical, nuclear and pharmaceutical industries on a global scale. And small enough to give you the individual care and attention you need yet big enough to support multi-site, multi-national blue-chip chemical companies. Our global manufacturing facility in Milan is strategically located to support our customers across the world.

DHD Cooling Limited

Design, installation and maintenance solutions for industrial cooling. Our service extends to cooling system inspection, testing, service, maintenance and new equipment capability. Regulatory and reliability assessments, thermal performance improvements, turnkey projects and carbon footprint reduction.

Dron & Dickson

Dron & Dickson are recognised market leaders in the supply and maintenance of hazardous area electrical equipment. Our Engineering Services and Wholesale divisions offer bespoke solutions incorporating the very latest industry standard and safety legislation.

Flexim Instruments UK Ltd

We support UK clients with their measurement, commissioning, verification & maintenance needs. Offering clamp-on flow metering of liquids & gases; SIL 2 for safety critical duties; mass flow or concentration measurement options from outside the pipe; virtually zero maintenance; no cost escalation with exotic pipe, pressure or temperature; no outages for commissioning or maintenance; zero leak paths

Glacier

With a track record spanning over 80 years, we offer a full turnkey service comprising the design, manufacture, repair and maintenance of pressure vessels and heat transfer equipment, including full failure analysis to help restore assets to optimal working condition, saving significant time and money.

Laker Vent Engineering Ltd

Supply, fabrication and installation of process and utility piping systems. Project management, detailing, procurement, on and off-site fabrication and installation of pipework and coded welding. Associated steelwork supporting and mechanical installation of plant and equipment. Testing and Handover. Pipework and steelwork is fabricated to specific customer-needs and conforms to all appropriate ISO, BS EN and ASME standards and specifications.

Lokring UK

Lokring UK offer technical engineering support and sales for Lokring technology across the UK. The Lokring "Cold Weld" pipe and tube joint reduces the need for hot work, NDT inspection and reduces on site resources. Code compliant with ASME B31. Lokring is a Safer, Faster, Lower Cost replacement for site welding and flanged fabrication.

Manntek AB

Supply of safety dry disconnect and safety breakaway couplings. Comprehensive range of specialist dry quick release couplings to suit 99% of known chemical applications. Bespoke solutions with a size range of 3/4" to 8" nb. Dry disconnect couplings are made to NATO standard Stanag 3756.

METTLER TOLEDO

Mettler Toledo manufacture & service weighing, analytical and inspection equipment used throughout the product cycle from Research & Development, through Scale-Up & Production to Quality Control, Storage & Despatch. We work with our customers to understand and achieve their business goals, including key areas of safety, quality, productivity and sustainability.

MCE Group

Offering valve service and overhaul in our state-of-the-art service workshops, or on site, using OEM parts, from single valves to complete outages.

European distributor for ValvTechnologies, providing severe service, zero-leakage isolation valve solutions, setting the standard for the next generation of valves for the chemical industry.

Perry Process Equipment Ltd

Buying and selling of high quality used processing plant and equipment. Savings of up to 70% on the cost of process equipment, full mechanical and electrical refurbishment and equipment immediately available from stock. Centrifuges, dryers, evaporators, filters, heat exchangers, mills, mixers, reactors, separators, tanks.

Pumptec Engineering Services

Specialises in supporting the chemical industry in the inspection, repair, overhaul and fitting of all types of rotating equipment. Our highly trained engineers can support your routine maintenance, call outs and shutdowns. Our Wirral based machine shop can complete overhauls on your pumps, fans and mixers.

ProDecon®

Providing industrial service solutions to the Oil&Gas, Chemical, Power, Pharmaceutical and Industrial sectors. Specialising in hazardous hydrocarbon and chemical environments. ProDecon® has a unique range of technical expertise, that enables us to support customers with restoring process performance and providing maintenance risk management through bespoke industrial cleaning solutions.

SABSCO (Steam and Air Blowing Service Company)

is the British subsidiary of the Solarca Group, with offices in Kent. They have been providing world-class steam/air blowing services on projects across the globe since 2003. With the addition of SABSCO, the Solarca Group gained a major competitive advantage: the ability to offer integrated chemical cleaning and steam/air blowing services. World-renowned in their field, they have been selected by leading engineering companies for large-scale steam/air blowing projects in every corner of the globe

Studley Engineering Ltd

A multi-disciplined mechanical and electrical engineering contractor, providing a comprehensive service to the process industries in disciplines including: steelwork, welding, maintenance, site services, pipework, tanks and vessels. Over time we have gained an enviable reputation as a reliable, responsive, motivated contractor that delivers safe, high quality, cost effective work.

Swagelok Manchester

Fluid system solutions, products, training and services. Supply of over 7000 fluid system components including: fittings, hoses, tubing, regulators, equipment servicing and custom fabricated solutions. Provision of practical information, know-how, tools and speciality services needed to purchase, manage and apply them successfully.

Yokogawa

Yokogawa is a leading provider of field instrumentation, safety systems, industrial automation and digital transformation solutions. IIOT, OT Cybersecurity and Alarm Management are specific areas of focus for Yokogawa's Advanced Solutions team with a number of major projects currently being delivered across Europe.

Engineering project management & energy

6 Engineering

Is a safety engineering consultancy for the major hazard industries specialising in process and functional safety. Our mission is to provide world class safety expertise, helping you to keep people and assets free from unnecessary risk. Our site engineers can be there to support you when you need us. See more at www.6engineering.co.uk

Atlas Copco Rental UK

Provides temporary cost and energy efficient solutions for long- or short-term demands, planned maintenance or unexpected emergencies. Our engineers design the most suitable temporary installation, utilising our fleet of state-of-the-art equipment which includes 100% oil-free Class 0 and oil-injected compressed air at medium or high pressure, generators for power, and nitrogen. Quality of service, environmental care and personnel safety are guaranteed by our triple ISO certification.

Axiom Engineering Associates Ltd

An award-winning company specialising in the provision of UKAS accredited inspection services, backed up by a mechanical and materials asset integrity section. Acting as the design and inspection authority to many blue-chip companies, working across a broad range of process sectors such as: chemicals, petrochemicals, bulk storage, power and pharmaceuticals.

Clarke Energy

Specialists in the engineering, installation and maintenance of reciprocating engine-based Combined Heat & Power (CHP) plants. Offering ranges from supply of an engine through to turn-key installation of a multi-engine power plant. Our facilities deliver fuel efficiency, dramatically lower energy costs and help reduce carbon emissions. Carbon dioxide can also be recovered.

Graham Hart (Process Technology) Ltd

Delivering high integrity heat transfer equipment for over 45 years. The company has a strong emphasis on Chemical/Process & Mechanical Engineering backed up by an advanced manufacturing facility.

IKM Consulting

With 25 years of civil & structural engineering and environmental consulting experience, IKM's portfolio in high-hazard and regulated industries is extensive. With offices in Runcorn and Grangemouth, IKM specialises in consulting services around asset integrity, secondary & tertiary containment, asset infrastructure inspections, environmental risk assessments and COMAH compliance.

Otto Simon Ltd

Diverse engineering consultancy and project delivery organisation. Initial consultations, technical and commercial due diligence and front-end design and definition. Feasibility studies through design, supply, erection, and commissioning services using in-house and licensed technology. Services for complete plants or upgrades. Procurement, construction management, start-up and operation & maintenance expertise.

PM PROJEN

A multi-disciplined engineering, design and project management business working across a range of market sectors for a diverse mix of clients from SMEs to multinational blue-chip companies. We are part of PM Group, a 2,200 strong, employee owned company operating across Europe, Asia and the USA.

Engineering, IT & process consultants

EJ Peak Technology Solutions

Process control, industrial automation systems and manufacturing analytics. A unique combination of automation projects, consultancy, and performance improvement services delivered by experienced teams. FEED, process control projects, legacy asset replacements, control room and operational technology, modern manufacturing analytics solutions.

Gexcon UK Ltd

Safety and risk management and advanced dispersion, explosion and fire modelling. Unique expertise and shared knowledge on how to prevent explosion accidents. Carrying out accident investigations and dedicated facilities for physical testing. Ventilation and dispersion modelling also available. Hazardous area classification and quantitative and qualitative risk analysis and assessment.

Siemens Digital Factory & Process Industries and Drives

Productivity and efficiency requirements continuously increase in the field of process automation. A comprehensive range of process automation and Drives products as well as an award-winning range of training and support services.

Environment, health & safety risk management

ABS Consulting

A global process safety consultancy and training services provider with regional headquarters in Warrington, UK. Our expertise in data-driven risk and reliability includes a range of capabilities: root cause analysis, incident investigation, organisational culture evaluation, risk management, process hazard analysis, bow-tie and data science techniques. Our approved process safety leadership training courses and proficiencies also include building risk assessments, HAZOP analysis, compliance auditing, asset integrity management competency assurance and management systems certification services.

BakerRisk Europe Ltd

Dedicated to help predict, prevent and mitigate hazards and explosions, fires and toxic releases. Specialising in process safety and risk management, we help clients understand their risks and offer cost-effective risk management solutions. Success is delivered through proven knowledge and experience, innovative research and unique engineering capabilities.

Chemical and Industrial Consultants Association

An association of independent consultants with extensive experience, many having worked in the chemical industry, across various fields. Provision of technical and business advice on almost every aspect of chemical manufacture, development, marketing and management.

RAS Ltd

Expertise that covers the full range of risk assessment and management services across: safety risk, business risk and environmental risk. Carry out Quantitative risk Assessments and Predictive & consequence modelling, through 'softer' risks affecting an organisation's reputation.

RPS Group

Provision of specialist consultancy to help those with responsibility for health and safety achieve compliance. With particular expertise in the chemicals sector, we provide support from plant development through to operation. Core services include: ATEX/DSEAR, asbestos, BowTie analysis, CDM, COMAH support, fire safety engineering, functional safety, hazard identification, Legionella, occupation health and risk assessment/analysis.

SLR Consulting

A unique blend of leadership, management, consulting, engineering and training services is offered to the chemicals industry. A forerunner in sustainable process safety management combined with proven business improvement capabilities enables delivery of practical solutions to promote safety and efficiency in design, operation and maintenance of complex hazardous facilities.

Facilities, finance and other business services

Department for International Trade – Northwest

Operational support for British exports as well as facilitating inward and outward investment activity. Support is given to first-time exporters or established exporters requiring more help with accessing more difficult markets or putting strategic alliances in place. Access to expert advice, trade services, training and events.

Halton Borough Council

World renowned research facilities such as Sci-Tech Daresbury and The Heath alongside many companies at the cutting edge of science, technology and advanced manufacturing. We oversee capacity in terms of land, buildings, people and business support creating a world class location.

Pen Underwriting incorporating OAMPS

Specialist Insurance services to high hazard manufacturing and haulage industries. Motor fleets, property, liability and transit policies. We help clients minimise risk through proactive risk management and a range of training and response services to assist companies in planning for and dealing with incidents and emergencies.

Sci-Tech Daresbury

We are a national science and innovation campus, and enterprise zone providing a range of office, laboratory and workshop accommodation for technology companies (from a desk to large laboratory and office units). Companies have access to a range of facilities covering material analysis, virtual design & simulation, and rapid prototyping.

STFC Innovations Technology Access Centre

A unique, fully equipped space for innovation, research and development. Providing flexible access to laboratory space, "hot labs" and scientific equipment. Ideally suited to start-up companies, smaller and medium size enterprises and R&D team from established companies.

TW Languages Ltd

Provision of a professional and reliable multi-lingual translation service delivering high quality translations. We specialise in business, technical and scientific translations into 250+ language combinations. We provide certified translations for legal purposes. We are full members of the ATC & EUATC and ISO 17100 Translation Services certified.

Laboratory products, testing and services

XCellR8 Ltd

A world leader in animal-free testing. Our GLP accredited laboratory provides groundbreaking in vitro safety tests for the chemical and personal care industries. We are passionate about delivering testing strategies that are both scientifically advanced and ethically sound. Our award-winning work is recognised at a regulatory level by the OECD and ECHA.

Legal & patents

Appleyard Lees LLP

Patent and trademark attorneys. Aim to obtain the best possible patent protection for clients. Experience of product clearance against competitor patents and in due diligence for mergers and acquisitions. Advice on licensing issues and collaboration agreements relating to IP.

Bawden and Associates

A legal firm providing professional services across all IP matters. Drafting and prosecution of patent applications, handling opposition and appeals in the EPO and in litigation in UK and international courts. Business led and strategic approach to generate assets of real commercial value.

Mathys & Squire LLP

Mathys & Squire LLP is a full-service intellectual property law firm with industry-leading expertise in patents, trade marks, design protection and IP litigation and including a dedicated chemistry team of highly experienced attorneys holding higher degrees and research or industrial experience who are passionate about innovation in the chemical field.

RW Legal Ltd

Provision of pragmatic legal advice to companies in the chemical sector. Particular expertise in drafting and negotiating commercial contracts. Managing legal risk through early involvement to save time and resources in the long run. Competitive rates and flexible fees without sacrificing quality.

Squire Patton Boggs (UK) LLP

Global legal company providing legal, regulatory and advocacy assistance to the chemical and performance material industries. Expertise that emphasises areas that mean the most to industry such as environmental, mergers and acquisitions, commercial finance, construction, litigation, IP, public policy and international expansion.

Withers & Rogers LLP

A leading UK and European intellectual property law firm with five offices including London and Munich. We offer a range of IP services including obtaining UK, European and worldwide patent or trade mark protection, the handling of contentious matters, advice surrounding licensing arrangements and issues including validity of patents and "freedom to operate".

WP Thompson

Intellectual property attorneys providing high quality advice to start-ups, SMEs or FTSE 100 companies. Team of experienced IP attorneys specializing in chemistry and life sciences, with first degrees and PhDs in these fields. Securing the most appropriate, cost effective and commercially valuable protection for your intellectual investment and innovation.

REACH and chemicals services

Dr Knoell Consult Ltd

An independent service provider for the chemical and related industries. Globally the Knoell group has over 450 employees covering all aspects of regulatory compliance for industrial chemicals, agrochemicals and biocides: e.g., strategic planning, dossier preparation, exposure assessment, SDS preparation, and from REACH to K-REACH!

GlobalMSDS

A complete safety data sheet/literature and regulatory service for your entire product communications in any language, style and format required. Hazmix is a new 'pay as you go' web-browser product that is setting a new standard in SDS authoring. A Solutions service that also provides technical advice.

Intertek Regulatory Services

Health, environmental and regulatory services for implementation of chemicals management. Worldwide registration of chemicals, food contact compliance and notification, global chemicals compliance, design/optimisation of toxicological and eco-toxicological studies, hazardous substance management, EU cosmetic and biocidal products compliance, classification & labelling, SDS consulting.

Yordas Group

Yordas Group is a leading provider of scientific, environmental, human health and global regulatory consulting services. They offer chemical regulatory support, expert scientific services and support on chemicals management and product stewardship, global hazard communication, hazard and risk assessment, analytical and (eco)tox testing.

Recruitment

Adepto Technical Recruitment

A specialist engineering, manufacturing and scientific recruitment consultancy that focuses upon the provision of permanent staff and contract resource to the Chemicals industry. Established in 2015, Adepto has quickly become the partner of choice for many blue-chip and SME manufacturers, engineering companies and consultancies due to our deep knowledge of the industry, credibility and professionalism.

Eleven Recruitment

Eleven Recruitment has been a specialist recruiter in the chemicals, energy and commodities sectors since 1999. We have a strong track record of sourcing mid and senior level talent, including C-Suite, with specialist knowledge and experience. We can provide both contingent and retained recruitment services or work with clients as an integrated recruitment partner.

Handley James Chemical

Mid to senior level appointments solely within the Chemical Manufacturing space. Over 30 years search experience. The company was built on the success of Stuart Tomkinson's successful 11-year recruitment career primarily within the chemical manufacturing arena. Focusing on providing the best talent in the chemical industry. We work closely with you, to understand your business, your culture and exactly what you are looking for from a recruitment partner.

RMG

RMG is an award-winning headhunting consultancy with a difference - we make it our business to search and understand who's who in the Chemicals and STEM sectors and have the know-how to find talented people who will deliver lasting impact and add financial value to your organisation.

Science Recruitment Group

Experts in the recruitment of scientific, regulatory, quality, engineering and technical professional across all areas of the industry. Support in recruiting temporary, contract or permanent staff for your team.

Science Solutions Recruitment

Is a specialist science & technical recruiter with specific expert teams to service niche fields, including speciality chemicals, drug discovery, polymers, materials, cosmetics, personal care, household products, pharmaceuticals, biotechnology & medical devices.

TransitionPlus Ltd

Executive search for science-based organisations, talent development, outplacement and career transition support. Experienced chair, NED, coach and business development consultancy. The "Plus" is to ensure that considerable attention

PFAS Decontamination of Fire Suppression Systems



IS YOUR BUSINESS COMPLIANT?



Keeping Ahead Of Regulations

Class B firefighting foams used in industrial fire suppression systems contain PFAS (Per- and polyfluoroalkyl substances), sometimes referred to as 'forever chemicals' due to their longevity in the environment which poses a potential risk to human health and the environment.

Since 4th July 2021, holders of greater than 50kg of Class B firefighting foams (AFFF, FFFP and FP) across all the sites they operate, have a legal obligation to report the nature of the foam (C6 or C8) as a stockpile of persistent organic pollutants (POPs) under the REACH regulations. From January 1st 2023, C8 foams cannot be used if the released foam cannot be 100% contained, with a complete ban from July 4th 2025. Further regulations addressing C6 foams are currently under review.

PFAS Foam Transition

With use of these foams being subject to regulation, many businesses are required to change their foam stocks to alternative fluorine free firefighting foam (F3). There are many F3 foams available that have passed multiple fire tests, showing comparable performance to fluorinated foams and are described as being 100% biodegradable so represent a safer and more sustainable option.

Effective decontamination of the existing fire suppression infrastructure is essential as fluorosurfactants are known to self-assemble on interior surfaces in large supramolecular assemblies.

Evidence has shown that flushing a system with water has not been effective in removing these layers, leading to significant recontamination of PFAS in new foam stocks. This results in the new F3 foam stock being classed as renewed stockpile of POPs under REACH regulations.

A Trusted Partnership

The ProDecon® and Tetra Tech partnership provides market leading expertise and comprehensive management of the foam transition programme including fire engineering, decontamination and environmental compliance. Our team can assist with chemical analysis of firefighting foams and help manage the environmental risks and prioritising where to start foam change outs.

Utilising proprietary decontamination agents PFAScrub®, our partnership will provide regulatory assurance with the removal of self-assembled forms of PFAS that adhere to interior of fire suppression systems, ensuring you remain compliant in the transition to fluorine-free foam stock.

Assets supported include:

- ▶ FOAM SUPPRESSION SYSTEMS
- ▶ FOAM STORAGE TANKS
- ▶ FIRE ENGINE TANKS
- ▶ PUMPS
- ▶ MARINE & MILITARY SYSTEMS
- ▶ PIPEWORK



For enquiries:
Matt Calveley
Sr. Development Manager
matt.calveley@prodecon.com
www.prodecon.com

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