Chemicals northwest

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Spring 2022

A unique industry, with unique companies and unique news

Elements

In this issue:

- A roundup of our HyNet Project Webinar
- Recruiting the right skills for the move towards a hydrogen economy
- Focusing on how to deal with ageing plant sustainably
- The importance of colour consistency
- The value of staged and methodical hazard studies
- The changing energy landscape
- Welcoming students back into the workplace

...Plus, news and articles from a wide range of members

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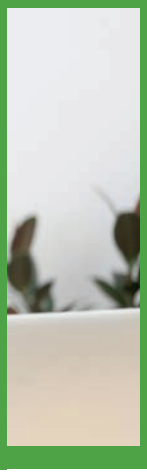

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RISK & HAZARD MANAGEMENT

Contents Spring 2022

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? See over for details.

https://www.cia.org.uk/chemicalsnorthwest/Membership/Benefits-Costs/

2022 rates. ***(from 1st April 2022)***

Micro corporate membership	(1 - 10 employees)	£453+VAT
Standard corporate membership	(11-100 employees)	£789+VAT
Large corporate membership	(100+ employees)	£1004+VAT

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 Spring edition of Elements magazine.

Finally, the days are getting longer, and we are looking forward to being out and about and back together, as the last remnants of the COVID restrictions are lifted.

We've had some really interesting engagements with members over the last few weeks. Firstly, our HyNet project webinar, which was really well attended, gave some interesting insights into progress made so far and the imminent impacts the work will have on our northwest business community. If you missed the webinar, but would like to hear a little more, turn to page 12, where Rachel Perry, the Project Manager gives an overview of the task in hand.

We also held our first face to face event of the year in Daresbury, in early March, for our breakfast briefing. There we welcomed four new members, Beamex, Mettler-Toledo, Flexim and Holiferm who gave an overview of their services. If anyone would like more information, please do let me know.

Also in this issue, we await the judging on the Chemicals Northwest Awards for 2022, which you will remember are taking place at The Point, Lancashire County Cricket Club, Emirates Old Trafford, Manchester on the 24th March 2022. We are very much looking forward to welcoming many of our members to the event, which we hope will be really enjoyable.

Members have provided a range of articles and news stories for you for this issue, covering topics
As diverse as recruiting the right skills for the move towards a hydrogen economy, a focus on how to deal with ageing plant sustainably, the changing energy landscape as well as some heartening news, which sees students finally able to get back into the workplace to understand what opportunities exist for them post school. We hope you enjoy reading them.

Please keep an eye on our website for 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 don't hesitate to get in touch.

Fiona Hought - **Member Services and Events**

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. Here are the the main features and benefits of membership...

Annual Awards Dinner - During the annual CNW awards programme we are privileged to witness the many achievements made in our local sector. Culminating in a great night of celebration each year's awards are a fantastic way your company can support the region's chemicals sector and help raise your own profile. Up to 300 guests from across the industry gather on the night and everyone can see for themselves the amazing achievements made by our people and organisations.

Partner events - Over the years CNW has focused on a range of highly topical and relevant business issues. We run these focussed events in conjunction with members. Technical, regulatory and operational insights have been delivered by experts in their fields. These events ensure good practices are shared and all attendees gain new knowledge. As businesses get to grips with the changing landscape there will always be new issues for members to analyse.

Breakfast Networking - Chemicals Northwest is gaining a growing reputation for high quality breakfast networking events. With no specific theme, delegates are encouraged to make new contacts and some will make short pitches about their company, its products and services plus news announcements! The breakfast meetings have proved to be very popular and currently run on a 2 monthly basis. New contacts can lead to new opportunities and new business. All are welcome.

Common Interest Groups - Chemicals Northwest's **REACH** group has followed closely the developments within this complex and long term piece of legislation. The initiative allows the sharing of experience, best practice and knowledge between manufacturing, supply chain and support service providers, all with a keen interest in REACH. The group meets three times a year

.

CNW started the **Brexit** user group straight after the referendum in 2016 and it is gaining more and more support from membership. Whilst there is still uncertainty, many businesses will be looking to the future impacts, so we are enabling all interested parties to meet and discuss in more detail their common issues and concerns. Up to date information, expert insights and reports form the basis of each agenda, which will run parallel to the national work carried out by CIA.

Elements magazine - This is a great opportunity to establish an association between your organisation and important sector issues, by contributing free editorial and press releases. Companies who do business in the chemicals sector may also wish to look at advertising options. The CNW sector directory is now integrated into Elements.

Website - The website is regularly updated with industry news and the events programme. Companies are increasingly using it for enquiries and advertising. There is an efficient "e-shot" function which allows direct messaging to our contacts list. Viewers of the directory pages can search the whole of our supply chain providers to find where to buy products and services.

LinkedIn - The Chemicals Northwest LinkedIn group provides the opportunity for chemical industry professionals to share ideas and knowledge. There is also the CNW LinkedIn company page which provides a forum for information sharing between CNW and our members.

Twitter - Why not follow us. In addition we'd be happy to re-tweet any news or updates that members themselves tweet.

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Only when the risk facing an organisation is well understood can it be effectively managed. Key to the successful identification, assessment and management of risk is engagement with the right people, using the right processes at the right time. We believe we are different to many of our competitors and our approach is distinctive, we don't always walk the well-trodden path but look at each client's particular risk context and develop a tailored solution, working in partnership with our client.

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Hazard studies – the value of a staged and methodical approach

Hazard studies are a well-established and essential practice within the chemical industry and are intended to enable effective planning, implementation and safe operation of hazardous systems and processes.

Although studies such as Hazard and Operability (HAZOP) analysis are indeed well known and widely performed, is there a risk that we could be missing out on valuable process, safety and financial benefits by overlooking earlier, more fundamental, types of hazard study? What is the value of ensuring a staged and methodical approach? Whilst different studies are relevant for systems at all stages of their life cycle, consideration is given here to the benefits of a staged and methodical approach for planned new systems since, arguably, the benefits to be gained are greatest.

Generally speaking, there are eight types of hazard study (HS), beginning with HS0 (Inherency) at the research stage and extending to decommissioning at HS7. HS0 identifies the most fundamental or inherent means of minimising risk, so as to reduce later reliance on protective measures for an inherently hazardous system.

Following this is HS1, the 'Concept study', which is checklist-based at the start of process development and ensures an adequate understanding of the project, processes and materials. Often, these studies come up with numerous actions and suggestions that can really help with the design and again help to minimise the need for more protective systems and retrospective design changes at later stages in the project.

Hazard Identification (HAZID), or HS2, is again a prompt-based study which uses guidewords to help the study team identify hazards within a proposed design. This study is more structured around the proposed design than HS1, with the main purpose being to identify hazards and then suggest ways of eliminating or minimising them before it is too late to do so. Without HS2, unidentified hazards may remain and then cause problems in later hazard studies when the design is more difficult to change, or even at the construction or operation stages.

There is often an eagerness to jump straight to HS3, without performing earlier studies. Whilst HAZOP can be an incredibly valuable tool, without the supporting earlier studies, actions and improvements, it risks becoming a design review. This can repeat the pattern, with the HAZOP failing to identify key hazards and operability issues, potentially resulting in significant costs at later stages. It is all very well preaching the benefits of a methodical approach, but there is often a reluctance amongst design/engineering teams to take a step back and look at things more fundamentally using earlier hazard studies. However, experience has shown that such reluctance rapidly evaporates once, for example, a series of improvements has been identified during an HS1. Often this is quite a positive experience for the team and provides constructive momentum for subsequent studies, maximising the quality, findings and improvements along the way.

Once the HAZOP has been effectively carried out, the need for subsequent studies remains in order to ensure that the intentions and actions from earlier studies have indeed made it as far as the final design and build. This is where HS4 and HS5 come in and help to verify the safe, efficient and intended state of a new installation. This includes both the inspection of documentation and procedures as well as viewing the plant as constructed so that aspects discussed in the hazard studies can be seen first-hand.

The final two types of hazard study include a post start-up check (HS6) after the system has been up and running for a short while to make sure the system is functioning as intended and to identify any issues that have occurred, and which may need addressing. The final study (HS7) deals with the demolition of a plant when it has reached the end of its life cycle. Naturally, this needs to be done in the safest and most efficient way possible.

Overall then, the point is not a new one, but is nevertheless often overlooked. Taking the time to go about hazard studies in a staged and methodical manner will provide benefits for the safety and efficiency of a new installation, together with financial savings that would otherwise not be possible.

Carolyn Nicholls enquiries@ras.ltd.uk

IChemE Global Awards 2022

Celebrating Chemical Engineering Excellence

The IChemE Global Awards celebrate chemical, process and biochemical engineering excellence worldwide. With 19 categories, the awards recognise chemical engineering's best people, projects and companies.

Enter online by 15 July 2022: www.icheme.org/globalawards

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Medium combustion plant directive (MCPD) implications for chemical sites

The Medium Combustion Plant Directive (MCPD) forms part of the EU's Clean Air Policy and fills a regulatory gap between small and large combustion plant, targeting emissions from combustion plants of between 1 and 50MWth input.

The Environmental Permitting Regulations (England and Wales) were amended in 2018 to implement the requirements of the MCPD. When transposing the requirements of the MCPD into the EPR, Defra introduced additional controls for Specified Generators (SG)s. In short, the amendments require operators to obtain and comply with the conditions of an environmental permit if they operate a MCP or Specified Generator, with a small number of exemptions. Both the MCP and SG controls are implemented by the EPR.

'Medium Combustion Plant' (MCPs) are defined as combustion plant with a thermal input rating between 1MWth and 50MWth.

'Specified Generators' (SGs) are those MCPs that generate electricity for >50hrs per annum (incl. testing) or export electricity to the grid.

Key dates

MCPD controls apply to all MCP regardless of the fuel type used, which have a rated thermal input of each unit between 1MWth and 50MWth. SG controls, unless excluded, apply to generators with a rated thermal input between 1MWth and 50MWth. You may find that your plant must comply under both the MCPD and SG requirements. If this is the case, then your plant must be permitted by the earliest relevant permitting date. There are several factors which vary the date which you are required to have your MCPD or SG permit in place.

Key dates for MCPs

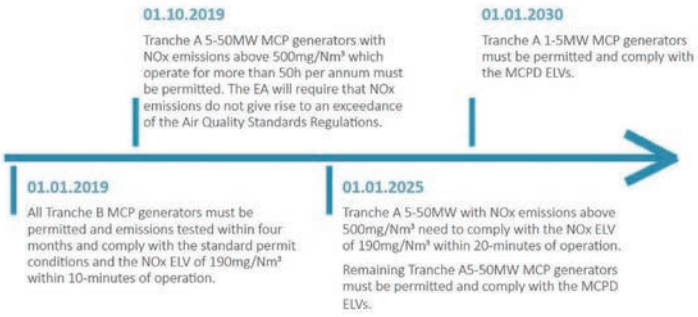
Key dates for MCPs are as follows:

Where:

- 'New' means any plant commencing operation after 20th December 2018; and
- 'Existing' means any plant which commenced operation before 20th December 2018.

Key dates for SGs

Key date for SGs are as follows:



Tranche A generators are those which came into operation before 1st December 2016, or benefit from capacity agreements from the 2014 and 2015 capacity market auctions or generators >1MWth with capacity agreements from the 2016 capacity market auction.

Relevant exemptions

There are several exemptions relevant to the chemical industries including for:

- Thermal oxidiser
- Facilities for the regeneration of catalytic cracking catalysts
- Facilities for the conversion of hydrogen sulphide into sulphur
- Reactors used in the chemical industry
- Cowpers

Should I have a Permit?

In line with the MCPD and SG requirements, you should already have obtained a permit for your site if you are;

- Operating a new MCP;
- Operating a Tranche B specified generator; or
- Operating a Tranche A SG between 5-50MW and have NOx emissions above 500mg/Nm3 operating at more than 50hr per annum.

If you wish to commission a new MCP or enter into a new capacity market agreement which causes your plant to become a Tranche B SG, you are required to obtain a permit before the commissioning date.

In line with the EPR, the next set of permitting dates are for;

- Existing MCPs above 5MW, which are required to be permitted by 01.01.2024; and
- Remaining Tranche A SG between 5MWth and 50MWth, which are required to be permitted by 01.01.2025.

Paul Wright, Technical Discipline Manager & Technical Director, Environment Management, Permitting & Compliance - pwright@slrconsulting.com
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Increasing innovation in green chemistry

The chemical industry is often seen as a significant contributor to climate change. Chemical industry waste products generated during use or production, such as VOCs and industrial by-products, have been under scrutiny for several decades. More recently, the level of plastics in the oceans and the amount of unrecyclable packaging and composite goods in the UK (and global) market has had a negative impact on the reputation of the industry.

These issues have led to change, and innovation, as the chemical industry seeks to address the issue of climate change, meet new environmental legislation and improve its reputation. As patent attorneys working with a variety of clients in the chemical industry we see this exciting change on an almost daily basis and have an active interest in green chemistry and helping our clients to protect their "green" innovations.

This interest in green chemistry has led to our inaugural Inside Green Innovation: Progress Report 2021. In this report we analyse patent filings to assess the state of progress for innovations relating to several key environmental challenges, including the development of bio-derived, biodegradable and recyclable polymers – also known as bioplastics.

Our report shows that particular advances have been made in improving properties of bioplastics (to provide performance and longevity), as well as optimising processes for producing bioplastics on an economically viable scale. Advances have also been made in chemical recycling technologies, with an aim of reducing waste plastic going to landfill. Making advances in these areas, so as to reduce environmental impact, is challenging, but our report shows that innovation is increasing and it seems unlikely that patent filings will reduce.

Bioplastics patent activity – a renewed focus

The number of patent filings since 2015 suggests a renewed upsurge in bioplastics innovation, reversing the decline seen since 2003. The leading patent filers have focused on biopolymer composition and structure, for example relating to biodegradable materials for orthopaedic medical devices and cleaning products.

Investment in developing new, biodegradable polymer blends is also aimed at increasing bioplastic strength and flexibility, while other biopolymer compositions are designed to make plastic bags both biodegradable and easier to open.

Recent patent filings have been led by organisations in Europe, South Korea and Japan, with the German and Korean businesses BASF and LG Chemical filing the most patent applications in 2020.

Plastics recycling – finding alternatives to mechanical recycling

Analysis of patent filings in plastics recycling technology also shows that innovation has been gathering speed in recent years.

The top patent filers include Eastman, Bridgestone, Chevron and Solvay. Eastman's filings since 2018 are centred on an improved process for pyrolyzing mixed plastic waste. While there is interest in pyrolysis techniques, we also anticipate increased patent activity in enzymatic breakdown of existing polymers and see indications of interest in ring opening polymerisation and ring closing depolymerisation.

Patenting green chemistry

Whilst in some ways patenting inventions that relate to green chemistry is the same as patenting any other chemical inventions, it is worth noting that when green chemistry patent applications are examined by Patent Offices, many patent examiners now recognise the benefits of biodegradability, sustainability and reduced toxicity as technical goals. This means that patenting in this area does not necessarily require inventiveness associated with more efficacious or improved products/processes. Instead, equivalent or even less efficacious products/processes that have unexpected benefits in biodegradability, sustainability, toxicity etc may be considered inventive.

In the UK, the UK Intellectual Property Office (UKIPO) Green Channel can be used for green technologies. This offers an accelerated patent process where the applicant "makes a reasonable assertion that the invention has some environmental benefit". The benefit can be associated with green technology, e.g. a simple manufacturing process that uses less energy relative to another would be eligible for filing through the Green Channel.

Having a UK patent for a green innovation can also help to release more funds for R&D through the corporate tax relief that is obtainable from the UK Government's Patent Box scheme. Further discussion can be found in this episode of The Greenshoots Podcast (episode 15), a programme for innovation owners and creators produced by the IP specialists of Appleyard Lees.

For more information on patenting your innovation, contact Kate Hickinson, Partner, Appleyard Lees.

https://www.appleyardlees.com/inside-green-innovation-progress-report-2021/

https://appleyardleesgreenshoots.com/

HyNet North West is the UK's leading industrial decarbonisation cluster - a low carbon energy project at the forefront of the UK's journey to a Net Zero future.

From the mid 2020's, HyNet will produce, store and distribute hydrogen as well as capturing and storing carbon to decarbonise the North West of England and North Wales through the creation of state of-the-art infrastructure.

Low carbon hydrogen will be generated at Stanlow, with carbon dioxide safely captured and stored offshore in the Liverpool Bay gas fields. A new pipeline network will transport the low carbon hydrogen to power industry, fuel transport and to heat homes.

HyNet has the potential to reduce carbon dioxide (CO2) emissions by 10 million tonnes every year by 2030 – the equivalent of taking four million cars off the road. It can deliver over three-quarters of the Government's 10 Point plan 2030 target for hydrogen production and 100% of the target for CO2 sequestration.

The project will form a low carbon hub, attracting investment to the area and supporting the retention of industry, much of which is vulnerable to carbon price increases. This will result in thousands of jobs, as well as enabling long-term sustainability for businesses, safeguarding jobs and creating financial security for communities across the region.

The HyNet project is being developed by a world-class consortium of regionally located partners, Progressive

Energy, Cadent, CF Fertilisers, Eni UK, Essar, Hanson, INOVYN (part of the INEOS Group) and the University of Chester.

Why choose the North West?

The HyNet cluster stretches from Flintshire and Wrexham, through Cheshire, Warrington, Liverpool City Region and Greater Manchester into Lancashire. This area boasts the largest concentration of advanced manufacturing and chemical production in the UK and is home to a host of energy intensive users.

The North West is an ideal location. HyNet will not only benefit from the existing regional technical skill base in chemicals production, refining and offshore oil and gas production and processing, but also has existing infrastructure already in place, including existing natural gas pipelines to transport the captured CO2. Repurposing of existing infrastructure is not only cost effective, it also allows for speedy delivery of the project to make the urgently needed rapid reductions in CO2 emissions.

The regions geology also lends itself very well to the project. The captured CO2 will be stored in depleted gas reservoirs under the seabed in Liverpool Bay in perpetuity. In addition, to manage peaks in demand, hydrogen will be stored safely in underground salt caverns within Cheshire's salt basin, a technology which is already used extensively for natural gas storage.

Demand-led

HyNet is a project led by industry demand. Multinationals and well-known brands, who manufacture the products across the region want to decarbonise and produce low carbon products for their consumers. HyNet provides the shared infrastructure, expertise and systems allowing organisations across the region to work collectively decarbonise at scale. Almost 30 major employers across the region have agreed to work with the HyNet low carbon cluster to decarbonise the food, ceramics, paper, glass and automotive sectors.

Why now?

Our entire energy system needs to be decarbonised rapidly to prevent the damaging and evident effects of climate change. There is no single solution - we need to deploy multiple approaches to transition as quickly as possible to clean energy.

Here is the North West, HyNet is delivering one of the lowest cost carbon capture clusters in the UK. We can accelerate the country's transition to a low carbon future, supporting the levelling up agenda.

With ongoing support from Government and continued collaboration across business, industry, public sector and academia we stand ready to deliver. As Secretary of State for Business, Energy and Industrial Strategy Kwasi Kwarteng said, "the ability of HyNet to transform the North West, safeguarding jobs, creating new ones and positioning the region at the forefront of green innovation is hugely exciting".

Rachel Perry, Project Manager, HyNet North West

HyNet - 'NW is leading the skills agenda' - 'Decarbonising the North West'

"HyNet is a ground-breaking clean energy project that will unlock a low carbon future for the North West and North Wales" - *Rachel Perry, HyNet Project Manager.*

The recent insightful and well-attended **CNW 'Decarbonising the NW' webinar held on January 27th**, showed the diversity of interested cross-parties in the HyNet agenda, project leaders, consortia companies, suppliers, skills providers and rightly so, with the exciting challenge and opportunity it offers both the North West and wider UK.

Most importantly, the need for local 'skills' and having 'the right people' (and suppliers) in place was emphasised by all the speakers, a point which I fully support.

'HyNet needs companies and people' – Richard Stevenson, INOVYN

The comments about 'needing everyone on board' by **Joe Howe, of the NW Hydrogen Alliance and University of Chester**, ring true, and the awareness that the 'world is watching', with the future longer-term export opportunity of our North West front-running skills too.

The potential of HyNet delivering nearly 6000 jobs in this region is certainly game-changing.

But from my perspective, working in the world of specialist headhunting, I think we need to step up a gear really quickly. There is already a shortage of Engineering, Technical, Scientific, Regulatory and Procurement candidates, these are all specialist 'skills in demand'.

The market is highly competitive, and the full extent of the skills shortage is not appreciated by many. More needs to be done to secure a supply chain of relevant skills for the future and finding more creative ways of acquiring 'the right' experienced people now. Many companies are looking to acquire the same style of skills (and calibre of person), which cross a multitude of functions and levels of seniority.

Besides all the work which is underway to ensure a future 'next generation' pipeline of relevant trained skills being developed for HyNet and our sector in general, it is clear that essential professional management expertise, and specific skills are needed now. To succeed every company needs the ability to be able to find, attract and retain these exceptional people, or otherwise their competitors will secure them. I am increasingly finding that exceptional people in the Chemical and Process Manufacturing sectors are very interested to have potential conversations about opportunities in the Hydrogen and Carbon-Capture arena, and in other 'clean' developments that are contributing to improving our environment for our future.

To echo what **Rachel Perry, HyNet Project Manager said at the event**, "Skills are needed to drive the **'Momentum and Delivery'**"

Companies need to value their internal talent and improve their retention of good people, challenging and investing in their people with the right attitudes, potential, loyalty and practical, functional experience to adapt their skills into different arenas.

Businesses also need to keep reinvesting in apprenticeship and graduate schemes, tactically and strategically upskilling all levels of staff and considering their best internally 'mobile' talent. Besides actioning external recruitment well in advance to secure growth, timely succession-planning and fill those ever-increasing expertise 'gaps'. Know when external recruitment will realistically be needed, at all levels of your business, to inject 'drive', experience, zest or creativity into your team and act early.

My tips to companies, are consider:

• Experienced, retained, specialist search experts (headhunters) who can offer you the 'knowledge' to secure **'in-demand' skills in this highly competitive market. By championing your company only** to search for these skills on a dedicated basis for you (rather than take an approach where 'everyone is fishing in the same pond'). You will then be able to access candidates in relevant arenas, or in an associated arena to find potentially transferable skills for you (where you may not have thought of considering). By retaining a recruitment partner, it allows them to give the appropriate time and necessary focus and attention to deliver your project.

• Work with a specialist recruiter who warrants being your advocate in this busy market, to sell the advantage of your individual opportunity, company and culture, and give you market feedback.

• Do compete to retain your people, before a 'counter-offer' is the only resort left to you, or when attracting new talent. Candidates want to be valued by their old or new employers, obviously by paying them an attractive salary and benefits package, relevant to the role and market (but without contributing to this skyrocketing in the NW!) But also, by communication, knowing their motivations, by challenging them, giving them scope, valuing their skills and potential, discussing their involvement in future plans. People like open communication and working hard in a happy and progressive environment, one they can see is of benefit to the wider world.

• A tailored search often leads to a referral to a 'perfect' person, and these are often not 'active' in the market and sector specialist recruiters, such as RMG, do become aware of unique, exceptional candidates, who seek confidential help to approach companies in this way. Allow your search supplier to know your 'watching brief', whether you are always interested in seeing a certain style of individual with specific functional expertise, for a 'first heads-up' in the market.

• Attracting talent.

RMG is keenly on board at this early HyNet development stage and offer relevant search expertise to recruit key people. We're a proven Search (Headhunting) Consultancy, sector-specialist in the Chemicals & Process Manufacturing sector with more than 30 years' experience based in Preston Brook, Cheshire.

Contact:
anita.caldwell@rmg-uk.com

Clarke Energy and INNIO Jenbacher are ready for hydrogen (H2)

As a key enabler and an integral part of the net-zero energy transition, INNIO Jenbacher launched their “Ready for H2” engine portfolio. Jenbacher Type-4 gas engines are available as “Ready for H2”, able to operate on up to 100% hydrogen. Other INNIO Jenbacher gas engines will be offered with a “Ready for H2” option, capable of running with up to 25% volume of H2 in pipeline gas and readily able to convert from natural gas to 100% H2 operation. Combined heat and power plants can be adapted to meet the changing gas supply, meaning investments can be made safely for new or existing facilities today.

With H2’s potential as a CO2-free fuel source and its ability to be stored, hydrogen is an integral part of the energy transition. INNIO already has 50 years’ experience in converting alternative fuels into power—and more than 8,500 Jenbacher gas engines already operating on climate-neutral gases today.

Up to 60% (volume) H2 content can be admixed to natural gas with special versions of Type 3, Type 4 and Type 6 engines. The type 4 engines are already available today as dual-gas-fuel solutions capable of running on 100% natural gas, 100% H2 or mixtures of natural gas and hydrogen.

Clarke Energy - Renewable gas fuelled engines, energy storage and hybrid power solutions.

Clarke Energy is the authorised distributor for INNIO’s Jenbacher gas engines in 28 territories. Offering an end to end service from initial concept to full engineering, procurement and construction (EPC), backed up by long-term maintenance agreements.

Clarke Energy is a multinational power projects business focused on flexible generation, decarbonisation, quality, efficiency, reliability and resiliency. Dedicated to achieving a net zero economy, guiding customers throughout their lower carbon journey.

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Engineer - Install - Maintain

Ready for Hydrogen

Clarke Energy and INNIO Jenbacher are ready for Hydrogen

INNIO Jenbacher engines are now able to operate on up to **100% hydrogen**, which can be used as a fuel to generate electricity, heat and cooling.

Combined heat and power (CHP) plants can be adapted in future to meet the changing gas grid supply, meaning investments can be made safely now for new or existing facilities.

INNIO Jenbacher have now launched their **“Ready for H2”** engine portfolio.

Combined heat and power (CHP) is an essential enabling and renewable fuelled technology to support the transition to net-zero carbon.

CHP remains is a safe investment for your business and can provide:

- **Sustainability**
- **Rapid Returns**
- **Energy Security**

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CHEMUK 2022 Presents 'The Chemical, Process & Plant Engineering Show' & 'The Chemical Industries Supply Chain Show'

The CHEMUK 2022 EXPO returns on the 11th & 12th May 2022 at the NEC in Birmingham. The event, now established as the UK's only major expo for the UK chemical industries, will showcase 300+ specialist exhibitors and 100+ expert speakers across two co-locating shows; 'The Chemical, Process & Plant Engineering Show', and 'The Chemical Industries Supply Chain Show'.

Show organiser, Ian Stone, comments: *"CHEMUK is deliberately set out to be a total industry meeting point, creating a fusion of cross-sector energies, inputs and connectivity, however we also recognise the contrasting needs of attending 'engineering & plant technical management' and the wider 'industry supply chain' focused attendees, on themes such as supply chain chemicals & ingredients, logistics & outsourcing, HSE, regulatory compliance, R&D management and more….*

Separating into two complimentary yet contrasting exhibition shows can only help to get attendees locked into discussions with their primary targets quicker, as well as providing an easy 'under one giant roof' experience to take in the broader trends of the sector"

The Chemical, Process & Plant Engineering Show

The Chemical, Process & Plant Engineering Show will showcase latest technology and specialist services to attending UK plant, process, control & engineering professionals across the chemical and wider process industries embracing:

- Process Plant / Chemical Unit Equipment / Process Ancillaries & Consumables
- CHEMICAL 4.0 / Digital / Automation
- Plant Energy Management
- Catalysis & Reaction Engineering
- Heat Exchanger technology / Thermal transfer innovation
- Control Valves & Actuators / Digital & Automation
- Pipes, Hoses, Tubing & Fittings
- Flow Technologies
- Filtration & Separation
- Mixing, Agitation & Dispersion
- Metering & Dosing
- Chemical Processing Tanks / Storage Tanks
- Conveying/Feeding / Materials Handling
- Industrial dryers
- Bio-Chemical Process Engineering
- Process Design / Modelling, Scale-up & Pilot Plant
- Predictive Maintenance / Condition monitoring / Asset management
- Plant Safety Systems
- Process QA / QC …and more

Current Exhibitors already booked into the show include; *FESTO, Schenk Process, Endress+Hauser, Applied Scientific Technologies, GEMU Valves, Moody Direct, Gericke, APEX Pumps, Atlas Copco, AVT Pump, Carbis Filtration, CDR Pumps, Elaflex, Falck Fire Services, HRS Heat Exchangers, VEGA Controls*… and many others.

Partners supporting the show include *GAMBICA, BPMA - British Pump Manufacturers' Association, BVAA – The British Valve & Actuator Association, Process Intensification Network, NEPIC, Chemicals Northwest and the Tank Storage Association…* to name a few

Show Feature: CHEMICAL 4.0 Stage – The Digital Opportunity
Reflecting the tectonic shift towards digitized operations, CHEMUK 2022 will present a dedicated speaker programme covering **Digital Adoption Strategies, Process Automation & Robotics, Big Data & Process Data Management, AI & Deep Learning, IIoT/VR, Digital-driven sustainability**, and lots more.

The Chemical Industries Supply Chain Show

The Chemical Industries Supply Chain Show will showcase specialist exhibitors to attending **Product Development, R&D, Supply Chain, Operational and Logistics teams** from across the chemicals, chemical products & chemicals-dependent industries, covering:

- Chemicals, Raw Materials & Ingredients
- Chemical Logistics & Transportation
- HSE Management & Regulatory Compliance
- Specialist Chemical Labelling
- Toll / Contract / Outsourcing/ White & Private Label Services
- R&D/Laboratory, Analytical & Testing
- Skills, Training & Recruitment
- Business & Operational Support

Major names already booked into the show include: *BTC Europe, Brenntag, Surfachem, Robinson Brothers, Kimia UK. Cod Beck Blenders, Airedale Group, Briar Chemicals, Libra Specialty Chemicals, NCEC, AirSea Containers, Knoell, RAS Risk & Hazard Management, Lakeland Laboratories, Rutpen…* and many others.

Partners supporting the show include the *CBA – Chemical Business Association, BCMPA – The Association for Contract Manufacturing, Packing, Fulfilment & Logistics, BIOVALE, Chemicals Northwest, NEPIC, CATCH, Royal Society of Chemistry…* to name a few

Expanded Sustainability & Circular Economy agenda at CHEMUK 2022:
New for 2022 is the dedicated **'Sustainability Stage'**, hosting panel sessions and feature presentations embracing critical themes such as chemical recycling & sustainable chemical processing, together with 'green chemistry' innovation and transition to bio-based products. Also new for 2022 will be the **'Bio-Based Chemicals & Processing INNOVATION ZONE'**, showcasing breaking innovation start-ups, university spinouts etc, with exciting concepts.

Show Feature: 'CHEMLAB' Programme
CHEMLAB will showcase specialist exhibitors providing Laboratory solutions & services, embracing Research & Development, Testing & Analysis, Process Design & Optimisation through to QC/QA Laboratory testing, serving the industrial chemicals & chemical products industries.

HERE'S WHAT THEY SAID AFTER CHEMUK 2021…
Excellent exhibition, including all aspects of the chemical industry in the UK. Product Group Leader, Caldic UK Ltd

DATES FOR THE DIARY
CHEMUK 2022 takes place on Wed 11th & Thu 12th May 2022
Venue: NEC - National Exhibition Centre, Birmingham, B40 1NT.

Opening Times:
Day 1: 9.30am – 5.00pm
Day 2: 9.30am – 4.00pm

Registration for CHEMUK 2022 will open in **February 2022**. Register for your FREE entry badge at:

www.chemicalukexpo.com

Three ways in which the chemical industry can benefit from engaging with a specialist translation partner

Before we take a deep dive into the subject, it's worth touching on some of the basic requirements for producing translations to a level that adequately addresses the exacting standards that any client in the chemical industry will require. The most important of these is a thorough understanding of the subject matter. Therefore, we always need to ensure that the linguists are not just experienced translators, but that they also possess the skills, experience, and qualifications relevant to the chemical industry.

Secondly, the linguist should always be a native speaker of the target language and preferably a resident in the target language country – keeping them continually abreast of linguistic changes and nuances. These factors will ensure that the translated output does the job the client asks of it – as well as delivering the benefits below. The translations industry partner chosen by your company must always make sure that any linguist entrusted with a technical subject is also a 'subject-matter expert'.

1. Compliance with the Globally Harmonised System

The chemical industry is a sector that continues to see excellent growth and has become increasingly globalised over recent decades. Product labelling needs to adhere to the 'Globally Harmonised System of Classification and Labelling of Chemicals', an international standard managed by the United Nations. This was set up to make sense of the assortment of hazardous material classification and labelling schemes previously used around the world. One of the main benefits that comes with having industry-specific translations carried out by a linguist who is also an expert in your field, is ensuring compliance with global standards. Accurate product and hazard labelling is a great example of this. Your translations industry partner can ensure the right blend of expertise – be sure to chat to them about specifics.

2. Transparent technical documentation

Because the chemical industry and its products are so closely linked to the health and wellbeing of consumers, exceptional care must be taken with translations. Accuracy and competency are essential, bearing in mind that many customers are then using the chemical products they purchase from the manufacturer in products of their own and will expect absolute clarity of descriptions and instructions to safeguard their own clients. This can make choosing a translations industry partner more difficult, but the benefits of choosing well are clear – client trust can only be built and maintained on the back of timely, accurate technical translations that convey the full meaning of the original complex documentation in all its linguistic nuances.

3. Compliance with government regulations

As with many other industries, the chemical industry marketplace is defined by fierce competition and escalating regulation. Manufacturers continually must ensure compliance with ever-changing regulatory requirements, ensuring the safety of logistics, employees, and customers alike. In line with such changes and in response to the shifting operational environment that they bring, international operators will require updated translations of relevant technical documentation. The associated translation work demands both linguistic ability and technical knowledge, but it is often hard to find linguists who combine that special blend of skills and experience. The benefit that clearly accompanies maintaining compliance with government regulations and industry standards is not only about peace of mind; your company's reputation and even its success rests squarely on how careful you are about meeting industry standards.

When looking for a translations industry partner, bear these important points in mind:

- Accreditation – do they have the required accreditations to be your translation partner?
- Industry knowledge – do their linguists have the specific domain knowledge and are 'subject-matter experts'?
- Quality assurance – do they have an effective quality process?
- Dedication – will you have a dedicated project manager?
- Reputation – who are their existing clients? Are they ISO-certified?

TW Languages provides clients with accredited chemical translations from experienced and qualified linguists. Our translations are provided with a quality service to match and go through a rigorous proofing process to ensure your translation is of the highest order.

Mark Whiteman
Director of Business Development
mark.whiteman@twlanguages.com
www.twlanguages.com

Digital Twin for Energy and Emissions Management

The energy landscape is evolving, with energy costs fluctuating over a wide range. Serious consideration for reducing greenhouse gas (GHGs) emissions while controlling costs is a worldwide concern. Traditional energy sources, such as coal and nuclear, have declined in importance, while supplies from natural gas and renewables are growing consistently. Manufacturers are aware of the role of energy in overall cost structures and emissions, so they are continuously trying to reduce both.

While overall consumption has somewhat recovered since the COVID-19 pandemic, traditional fuels may never return to their previous usage and are expected to decline over time. This is due to the growth of competing options (i.e., renewables) and their decreasing costs.

Manufacturing facilities need to consider producing, distributing, and mixing the available energy vectors, either traditional or renewable sources. If their choice does not work within their current energy system, they will need to reformulate. The objective is to reduce both cost and GHGs emissions.

When companies calculate consumption in real-time, it is possible to significantly reduce total energy use with just a few available actions. Area-by-area, quick improvements to improve efficiency and reduce consumption and emissions are possible. On the other hand, large-scale improvement projects, such as building an in-house cogeneration system, need thorough examination for cost/benefit potential.

Consider hydrogen production; traditionally, the least expensive way for a plant to generate hydrogen is by reforming methane. However, this process produces carbon dioxide as a by-product usually vented into the atmosphere. If the plant wants to eliminate carbon dioxide, it can use electrolysis instead. This costly approach breaks down water into oxygen and hydrogen ("green hydrogen"). Deciding if this is advantageous highly depends on the power source.

Suppose the electricity used to electrolyse water comes from a coal-fired power plant. In that case, the amount of carbon dioxide produced per unit of hydrogen is probably worse than just reforming methane. But the economics could change if generated by renewable sources or surplus output from the facility's cogeneration system. This approach produces less (or zero) carbon dioxide, uses no methane and might be less expensive. These conditions might not be available all the time, but a given industrial site should be able to take advantage of them when possible.

The ability to make this determination requires detailed knowledge of the sources and uses of energy for the facility at any given moment. It is necessary to coordinate information, forecasts, scheduling, regulations, reporting, trading, and control activities, as well as the appropriate set of software tools, as presented in Figure 1.

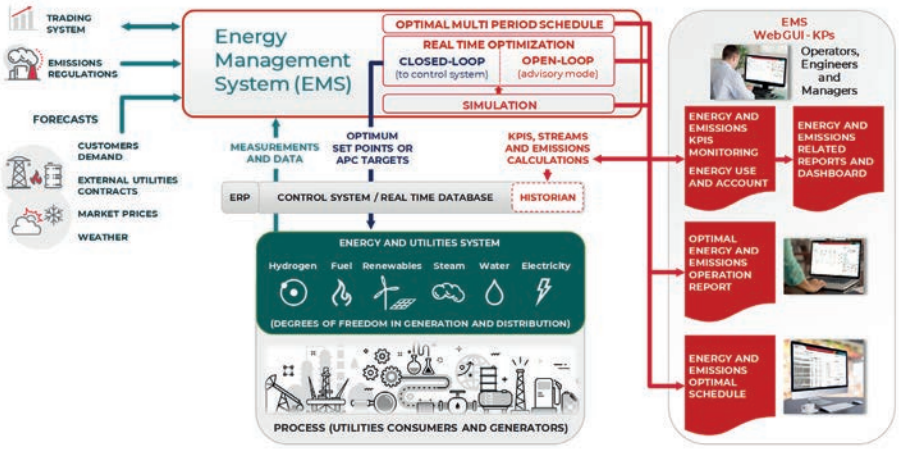

Figure 1: A modern Energy Management System

When data models and software tools are used, energy usage can be optimised based on the digital twin approach to minimise cost and emissions. However, few sites can perform such an evaluation automatically and in real-time. Even large and energy-intensive facilities may not have the expertise nor suitable software systems to gather all the supporting data and put it to work.

The analysis and quantification of all possible options determine which energy source should be used at any given time. Making the proper decision requires knowing the fuel and operating costs compared to the current cost of running off the grid. These values can fluctuate in time, depending on power price, weather conditions, renewable source availability, etc.

This kind of analysis is impossible to do manually for a large and complex facility to the extent and with the speed necessary. However, by using a real-time, model-based digital twin approach, companies can consider both the sources and uses of energy to substantially reduce the overall cost and GHGs emissions.

https://www.yokogawa.com/uk/

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A focus on asset life services

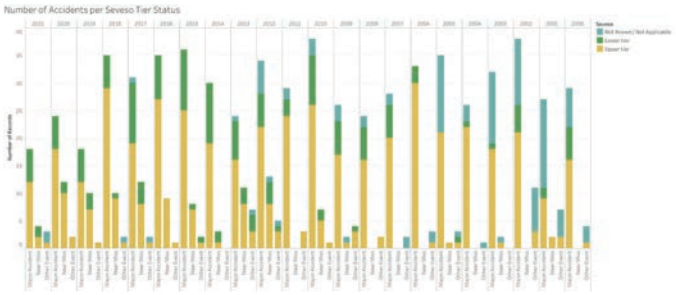
As operating plants come towards the end of their design life, an Asset Life Plan is vital to identify the investment required to sustain integrity and the required operating performance. This will allow the plant to meet production and legislative requirements for the longer term and provide a focus for both future finances and resources.

This results in the need to collect data, assess asset condition, identify vulnerabilities / risks and review future budgeting for repairs/replacements using an Asset Life Plan approach, with the aim being to assess the remaining life of existing assets and plan engineering work and expenditure to meet production requirements.

Ageing is not about how old the equipment is. It's about what is known about its condition, and how that's changing over time.

Across Europe, between 1980 and 2006, it is estimated that there have been 96 incidents reported in the MARS database relating to major accident potential loss of containment attributable to ageing plant. This represents 28% of all reported 'major accident' loss of containment events in the MARS database and equates to an overall loss of 11 lives ,183 injuries and over 170Million € of economic loss.

Recent HSE MARS Data shows that in 2021 we are in a period of low Major Accidents occurring, however near misses are projecting upwards over the last few years. It is probable that as we step out of pandemic and site activity increases, we may see an increase in such events. It is vital to identify all risks that may lead to such an event before an HSE intervention or worse.



HSE MARS Data

Managing a COMAH regulated site comes with its challenges in ensuring you manage all associated risks to prevent a Major Accident or Hazard. Understanding risks and identifying vulnerabilities is a key function in this regard. There are various levels of assessment that be carried out to support your business needs.

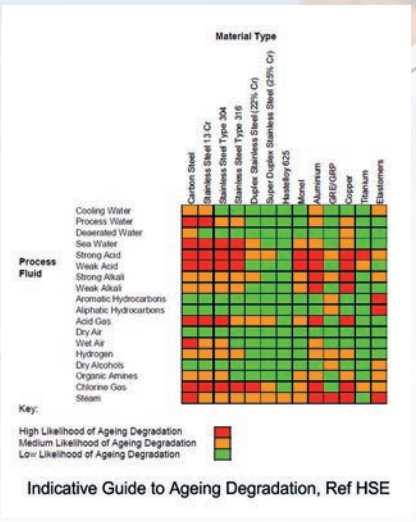
The figure top right describes the indicative degradation experienced on various systems. It is important to manage ageing plant which will improve long term planning for the business and improve asset reliability.

Our photo shows what happens to plant when left to degrade without intervention.

If you are not managing your degradation or risks, it can lead to increased business disruption and unplanned outages.

Axiom can support you to develop an Asset Life Plan to identify vulnerabilities and inform operation and maintenance strategies.

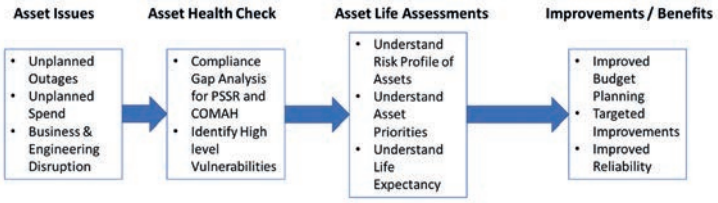
We can carry out a range of assessments to suit your needs including gap analysis for compliance, Asset Life Assessments, Remnant Life Studies and spares strategies to improve reliability of your Assets and to help meet industry standards and best practice.



Indicative Guide to Ageing Degradation, Ref HSE

CUI on Valve

Our Asset Life Plan approach covers the following stages:



Asset Life Plan methodology

We can deliver high level and detailed reviews into asset health tailored for your needs.

Good practice guides:

- PAS 55, Asset Management, The Institute of Asset Management
- Best Practice for Risk Based Inspection as a Part of Plant Integrity Management, CRR 363/2001
- RR509 Plant ageing: Management of equipment containing hazardous fluids or pressure
- RR823 Ageing Plant Study

paul.mcnamee@ax-ea.co.uk
www.axiomengineeringassociates.com

Patenting research outputs – medical and pharmaceutical inventions

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 highlighting the key considerations for researchers thinking about patenting an invention, Ian investigates patentability in the medical and pharmaceutical fields.

A Matter of Morality

Last time, we looked briefly at the types of subject-matter that are excluded from patentability. Among them were methods of diagnosis, surgery and treatment relating to humans or animals. Importantly, however, this does not include equipment and substances for use in those methods. The reason for this difference is considered a matter of morality. To illustrate, if a hospital lacked certain necessary equipment, this would be unfortunate but, under the relevant policy considerations, would not be viewed as immoral as hospitals may have access to different facilities. Conversely, if a doctor working at a hospital could not treat a patient simply because they were not permitted to employ a necessary method, this would be viewed as immoral. Yet methods not involving diagnosis, surgery or therapy may still be patentable if a monopoly on their use would not prevent patient access to medical treatment. Notwithstanding this caveat, medical equipment and substances are the more commonly patented and are our focus here.

First and Further Medical Uses

As we have seen previously, a product must be capable of industrial application to be patentable. Any patent application for a medical device, substance or composition must disclose how it is to be used but do so carefully so as to differentiate between the use of the product in a treatment and the method of treatment to which it may be applied. Often, medical compositions and substances have more than one beneficial effect and therefore more than one industrially applicable medical use. Thus, a previously-unknown new use of a known substance may be patentable (a so called second medical use). Indeed, there is no limit to the number of new medical uses of a single substance for which one could theoretically acquire patent protection.

Alternative Medical Uses

Often, innovation comes in the form of different applications of a product to a single known use. For example, a novel dosage regime of a drug, or use of a drug in a specific patient group, may yield unexpected benefits in the treatment of the disease for which its use is already known. Alternatively, a new and beneficial method of administration might be invented. Sometimes, a unique combination of previously known drugs might lead to unexpected beneficial therapeutic effects. Evidently, despite the unpatentability of medical methods, considerable protection is still available within the medical and pharmaceutical industries.

Supplementary Protection Certificates

Acquiring market authorisation to sell a medical substance or composition can be a lengthy process, and with good reason. Following the thalidomide scandal in the 1950s and 1960s, substances and compositions for use in humans and animals must undergo rigorous safety checks before being granted market authorisation. This can take many years, eating into the period of patent protection available and so too the considerable financial reward it may represent. Supplementary Protection Certificates (SPCs) exist to compensate patent owners affected by this process. They can extend the period of protection available for a particular product by up to 5 years. In addition, if investigations are conducted for potential paediatric uses according to an agreed Paediatric Investigation Plan, then an additional six months of protection may be available, bringing the SPC protection to a maximum of 5 and a half years. This system rewards a safety orientated approach by ensuring proprietors of such patents are not disadvantaged compared with owners of non-medical inventions.

Understand your invention

As we saw last time, knowing the inventive concept of your invention can help you avoid excluded matter objections from the Patent Office. This is particularly important in the lucrative but treacherous waters of medical and pharmaceutical inventions. Understanding precisely what extent of protection you seek will help direct your research, aid in drafting a patent application, and potentially direct your filing strategy, which we will discuss in more detail next time.

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

Colour: measuring for consistency

Colour is a marketing differential that has significant branding importance for a company's product range.

Whether it's the practically minded olive drab, or a favourite shade of lavender, the importance of consistency is paramount when producing coloured products for the end consumer. Consider a newly painted room: the perceived difference between a white and an off-white may not be obvious from the tin, however on the wall the results can often provide a stark contrast. It is within this minutia of differences that the importance lies, and this is something that can be investigated as a measurable concept.

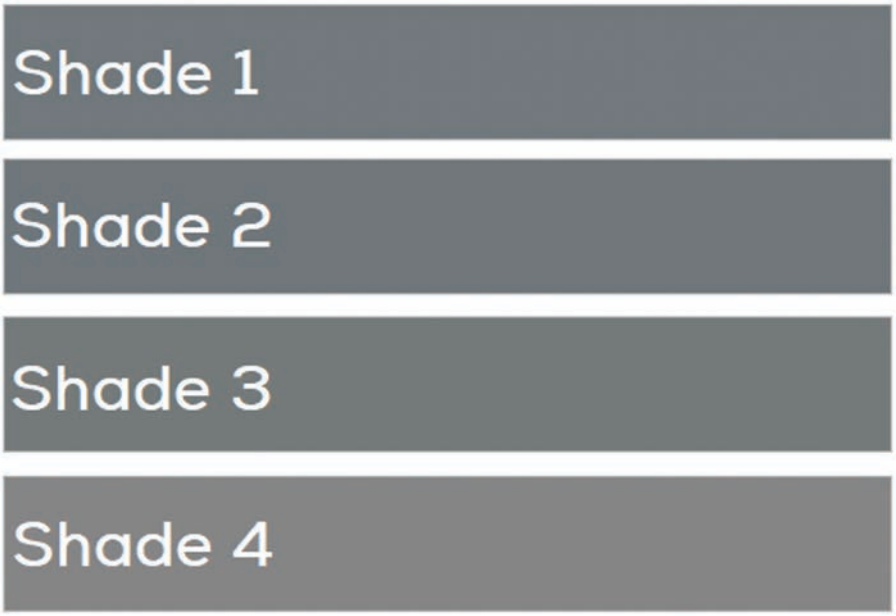
The method employed within ITAC's laboratory is the CIELAB colour space using a handheld spectrophotometer. A spectrophotometer measures reflected light over numerous points from which a spectral curve is produced. These curves are unique to each colour measured and help to develop a fingerprint for a given colour. What makes this instrument useful for a manufacturer is its measurement sensitivity and reproducibility which eliminates the shortcomings of visual perception in the human eye.

The method relies on numerical feedback given when an object or sample is measured and the data is presented as L*, a*, and b*.

These values represent the colour measured and where it sits on a cross-axis of colour and lightness. L* defines the lightness or darkness of a sample where L*= 0 represents black and L*= 100 represents white. The numbers in between these values provide us with invaluable brightness data between the two colours. The a* values can be negative or positive and dictate the colour's place between red and green – the negative values representing the green and the positive values representing red. The b* values follow the same negative and positive trend; however, they specify the colour's place between yellow and blue – with the blue end being negative and the yellow end being positive. Together this provides us with the information needed to measure and match colours from one to the other, and importantly, from batch to batch throughout production.

The data provided allows manufacturers to calculate a value known as ΔE (Delta E) or the change in visual perception of two given colours. The ΔE helps us to numerically decide if a particular colour varies from batch to batch. For example, a ΔE of zero would inform us that the two batches are a perfect match, whereas a ΔE of 2-10 is certainly not a match and differences are perceptible immediately. ΔE of <=1.00 is the gatekeeping value in colour difference that cannot be detected by the human eye. This tolerance can change depending on the specific batch. For example, some colours with a greater value than ΔE=1 cannot be perceived by the human eye. Other brighter colours will always struggle to obtain a lesser value than ΔE=1.

Below is an example taken from historical lab data of shades of grey that illustrate the subtle differences that can be achieved through varying ΔE.



The ΔE between shade 1 and shade 2 is 0.74; this is imperceptible to the human eye despite there being a difference in the L* values. Comparing shade 1 to shade 3 reveals a ΔE value of 2.86 – the difference is perceptible immediately as the brightness has changed but there is also introduction of yellow. Finally, comparing shade 1 to shade 4 reveals the biggest difference with a ΔE value of 6.83 which sees another increase in brightness and slightly more yellow. In terms of lab trials, shade 1 and shade 2 would be acceptable with no perceivable differences, however shade 3 and shade 4 would not be accepted.

This short article has discussed how colour can be measured to ensure successful alignment with the application, its manufacture, and end use performance requirements.

Further information on ITAC's colour testing capabilities can be found by contacting Tyler Coleman, Technical Manager, on 01204 573736 or by email at TColeman@itac.uk.com.

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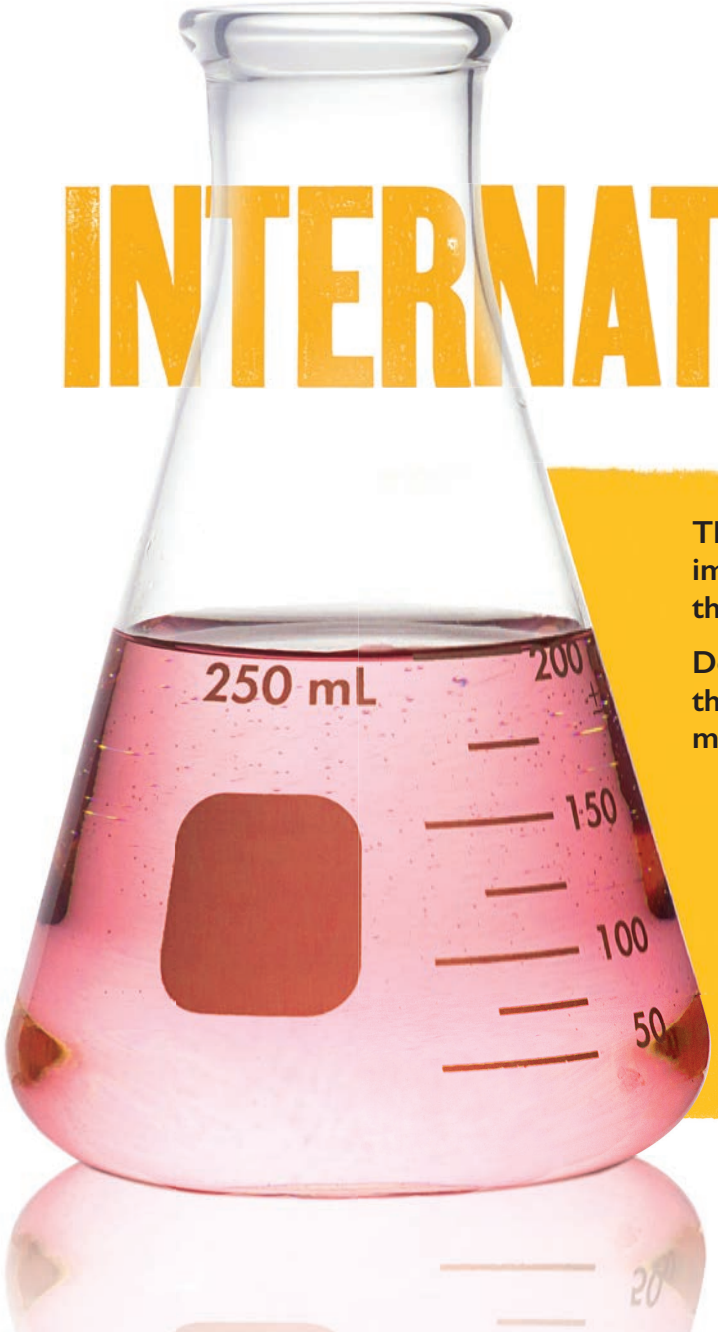

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Contact us:

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Are your site security risks as low as reasonably practicable (ALARP)?

In the UK, there are many chemical facilities that could be at risk from external physical and cybersecurity threats. Whilst many are covered by the Control of Major Accident Hazards (COMAH) 2015 regulations, only those considered to be Critical National Infrastructure (CNI) by the UK Government are specifically required to be protected against terrorist threats.

These sites are the focus of the Centre for the Protection of National Infrastructure (CPNI), which 'provides advice and assistance to those who have responsibility for protecting these crucial elements of the UK's national infrastructure from national security threats.' However, the UK terror threat level has remained 'Severe' since November 2021, begging the question: What do sites not designated CNI need to do to demonstrate an as low as reasonably practicable (ALARP) position for security risks?

From our global work with Major Accident Hazard Sites (MAHS), we have found that duty holders for hazardous facilities sometimes struggle to integrate Security Management Systems (SMS) with their requirements under Health and Safety legislation. Therefore, they can fail to develop a quantified ALARP position for security risk to the same level of detail as they would routinely provide within their regulatory safety justification.

A comprehensive Security Vulnerability Assessment (SVA) addresses chemical security by identifying whether you are a high-risk facility that possesses certain Chemicals of Interest (COI) above respective Screening Threshold Quantities (STQ). These COI are categorized into three (3) main security issues:

- **Release:** Toxic, flammable, or explosive chemicals or materials that can be released at a facility.
- **Theft or Diversion:** Chemicals or materials that, if stolen or diverted, can be converted into weapons using simple chemistry, equipment, or techniques.
- **Sabotage:** Chemicals or materials that can be mixed with readily available materials.

By integrating an SVA with existing safety studies, site owners can more effectively demonstrate the safety and security of their facilities in relation to potential external hazards. Having quantifiable data to understand threat levels against each hazard means that a site can tailor its security measures appropriately, ultimately providing more cost-effective security solutions.

The following guidance has been developed for SVAs:

- **Develop realistic threat scenarios.** CPNI guidance recommends the use of Operational Requirements (OR) or statement of requirement as an essential tool to enable an organisation to produce a clear, considered, and high-level statement of their security needs based on the risks they face. Mitigations to reduce the risk of theft are considerably different from those from an armed intruder.
- **Avoid unrealistic consequence assessments.** SVAs should be conducted in conjunction with the process conditions in the safety case submission to provide the most realistic results. When done in isolation, SVAs can predict consequences far larger than operationally possible.
- **Recognise shared security and process safety risk management barriers.** Unless specifically disabled by sabotage, barriers already instigated under PSM to mitigate the cause or effect of a loss of containment will still work during security-based scenarios. In conjunction with the use of process-based consequence modelling, the identification of existing barriers such as bunds, Emergency Shutdown Valves (ESV), gas detection or fire suppression could reduce the need for additional mitigations.
- **Apply risk-based mitigation strategies.** For realistic threat scenarios consider:
    - o **Acceptance.** Understand the probability of it happening and accept the consequences that may occur. This is the best strategy when risk is small or unlikely to happen.
    - o **Avoidance.** If the risk outweighs the benefit, stop performing that activity that causes the risk. Change the chemicals used or stop production of the product that makes the plant attractive to terrorists.
    - o **Mitigation.** For risks that cannot be accepted or avoided, commit sufficient resources to control the risks identified through barriers to initiation or consequence.
    - o **Reduction.** Businesses can assign a level at which risk is acceptable, which is called the residual risk level.
    - o **Transfer.** Move the risk to another third party or entity. Risk transfers don't always result in lower costs.
- **Mitigation effectiveness (ALARP).** As the final step in the SVA process, it is important to evaluate the effectiveness of the planned mitigation actions before initiating their implementation.

With the UK terror threat level at 'Severe', now is a good time to review whether your security measures are ALARP.

ABS Group has worked closely with the U.S. Department of Homeland Security's (DHS) Office of Infrastructure Security Compliance Division (ISCD), acting as a subject matter expert since September 2008. The primary focus of this partnership has been to provide technical support for implementing the Chemical Facility Anti-Terrorism Standards (CFATS), including production of the fundamental Risk-Based Performance Standard (RBPS). As we also have a great deal of Occupied Building Risk Assessment (OBRA) and Process Safety Management (PSM) experience, this combination has given us an almost unique understanding of the issues associated with managing security risks on MAHS.

Dan Humphreys, ABS Group
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Remote field device diagnostics: confidence in process analysers

Industry 4.0 and IIOT is changing chemical plants

The Internet of Things (IOT) is already influencing our daily life and will continue to do so in new and innovative ways. The ability to have everyday household objects analyse, observe, and interact with us is a valuable tool for improving our lives. Similarly, a key aspect of Industry 4.0 is the Industrial IOT (IIOT), the ultimate means of bringing the future of modern technology into your chemical plant.

With the implementation of Industry 4.0 and IIOT concepts, asset management software platforms have become critical for receiving, organising, and analysing the vast amount of data generated throughout chemical plants. These platforms allow staff to easily prioritise asset maintenance and other interventions based on how critical a task is, as well as its urgency. Access to this data from remote locations also limits the need for technicians to enter hazardous areas for non-critical routine tasks.

Intelligent maintenance systems bring it all together

The combination of the network, software and plant assets make up a complete example of IIOT: the Intelligent Maintenance System (IMS). The IMS includes the use of advanced sensors, data collection and data analytical tools. Thus, the system can collect data from machinery and instrumentation to predict and prevent their potential failure. As failures in equipment can be costly and even catastrophic, the system analyses the behaviour of the asset and provides alarms and instructions for predictive maintenance. Maintenance based on such intelligent information can save upwards of 50% of the costs associated with repairing assets after they have failed and can prevent potentially life-threatening accidents.

Intelligent sensors fit into these principles by offering smart diagnostics to optimise their maintenance, replacement and inventory planning as well as provide reliable fault alerts.

Process analysers need frequent servicing

Analytical instrumentation such as pH, ORP and (dissolved) oxygen analysers will require regular maintenance, cleaning, and calibrations. Eventually, sensors need to be replaced when no longer measuring reliably. Standardising procedures for instrument maintenance is difficult as different processes require different sensors dependent on process conditions at the measurement location.

Not all digital sensors are smart

Digital analytical sensors are rapidly gaining ground over analogue models but being digital does not automatically mean the sensor is intelligent. Some sensors may store calibration settings, or may simply record their duration of service, but none of this information will contribute to Intelligent Maintenance Systems if the sensors lack predictive diagnostics. Such simple data does not bring greater reliability than simple routine maintenance. Sensors that simply count down days until a maintenance task should be performed generate a false idea of the state of operations or process safety. If a counter has not reached zero, a maintenance engineer may wrongly assume that a heavily compromised sensor is still fit for use.

Intelligent analysers

Intelligent sensors and analysers that truly embrace Industry 4.0 should use real process information to constantly calculate unambiguous diagnostic values while measuring, namely:

- Number of days until a sensor will require calibration or maintenance - a precise date when attention will be required based on actual process conditions. Costs of calibrating or maintaining earlier than necessary are saved.

- Number of days remaining in which a sensor can confidently be used - calculated in real time. Avoids early replacement or unexpected failures.

- Instant alerts in the event of breakage, instrument fouling etc

- Verified alarms that use intelligent diagnostics to remove spurious or nuisance control room alerts

These genuinely intelligent diagnostics will provide clear guidance to inform users exactly when sensor calibration, maintenance and replacement will be required. Visibility of these unambiguous diagnostics can then be provided to asset management system using modern communication protocols such as HART, PROFIBUS, FOUNDATION Fieldbus and Profinet.

Summary

Industry 4.0 will continue to be a driving force for modern chemical plants. An inherent part of the strategy is an Intelligent Maintenance System that improves reliability, plant safety and profitability. Continuous real-time availability of instrument and machine diagnostics form the core of the IMS, while asset management platforms enable instant access to remote field devices and help define maintenance task to optimise workers' time and ensure safety.

As with any system, it is only as strong as its weakest link. Only unambiguous device diagnostics based on real process data and continuous instrument self-assessment can predict maintenance needs and protect safe operation.

For further information on this subject, please visit www.mt.com, visit us at CHEMUK 2022, May 11th/12th (Stand E17) or contact Ewan Jones, UK Chemical Industry Specialist, METTLER TOLEDO ewan.jones@mt.com

Human Factors in Health and Safety

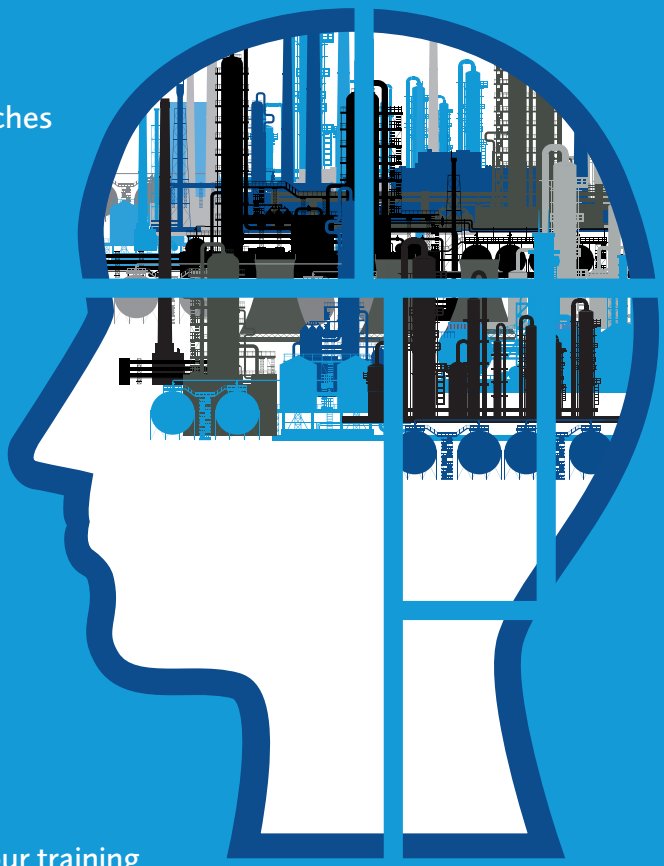
Modular training for the process industries

Online and face-to-face courses available in 2022

Would you like to develop your understanding of human factors in the chemical process industries?

Are you looking for practical guidance, tools and approaches to help you manage human factors effectively at your organisation?

Register for *Human Factors in Health and Safety* in 2022 and take your human factors understanding to the next level.



What's available?

Human Factors in Health and Safety consists of four modules:

- Managing Human Factors
- Managing Human Failure
- Strengthening Organisational Performance
- Human Factors in Design

Complete individual modules or all four depending on your training needs.

"Human Factors in Health and Safety has given me the confidence to lead the human factors agenda at a top tier COMAH site."

Ian Taylor,
SABIC UK Petrochemicals

"Human Factors in Health and Safety is an excellent learning opportunity and an important addition to the health and safety toolbox."

Ron Ramshaw,
Interconnector, UK

Find out more: **www.icheme.org/human-factors**

MB0336_22

Chartered Institute of Ergonomics & Human Factors
RECOGNISED COURSE

In partnership with THE KEIL CENTRE

IChemE ADVANCING CHEMICAL ENGINEERING WORLDWIDE

How clamp-on ultrasonic technology is delivering a simple, cost-effective hydrochloric gas flow measurement solution to chemical manufacturers

Under the challenging operational conditions within chemical sites, the advantages of using innovative clamp-on ultrasonic flow metering and concentration measurement really come to the fore. Non-intrusive and maintenance free, this technology offers optimum process plant control of downstream production systems with no downtime.

Flow measurement of hydrochloric gas on the DN150 supply to the integrated plant network

Producing methylene diphenyl-diisocyanate (MDI) as part of the polyurethane production chain, the plant of a major German chemical manufacturer is not only important in terms of the final product, but also supplies the site with pure gaseous hydrogen chloride. A vortex meter was used for quantity measurement and downstream valve control, however vibrations coming from the valve were interfering with the sensitive vortex measurement, resulting in erroneous readings.

If nothing flows here, receiving plants cannot produce

That was the headache. Receiving plants plan their operation based on exact amounts of hydrochloric gas, and the inaccurate vortex measurements made this impossible. Site operators urgently needed a reliable replacement with no downtime for removal of the defective measuring device.

Supply of hydrogen chloride to the site was ensured by simply retrofitting the measuring point with non-invasive clamp-on ultrasonic technology

Following a convincing flow metering demonstration by market leading ultrasonic clamp-on manufacturer FLEXIM, a permanent flowmeter was installed for non-invasive flow measurement of the hydrochloric gas. This meter has since been reliably recording the hydrogen chloride levels generated in the MDI plant and delivered to the site, ensuring the operation of the downstream production plant, and avoiding a plant shutdown.

Find out more

For a detailed application report of how these innovative non-invasive meters were successfully used at sites such as Dow, and to find out how you can reduce operational headaches like theirs,

Simply contact Simon Millington
ww.flexim.co.uk | sales@flexim.co.uk | +44 (0)1606 781 420

Students back in the workplace

As part of National Apprenticeship Week, a group of ten Year 10 and 11 students from Alder Community High School in Hyde, were invited by Stepan to visit their site and discuss the different career opportunities available with the company.

Since the outbreak of COVID in early 2020 and the restrictions it placed on face-to-face interaction, it has been a long time for young people not to have had the opportunity to visit workplaces and receive a meaningful experience with employers.

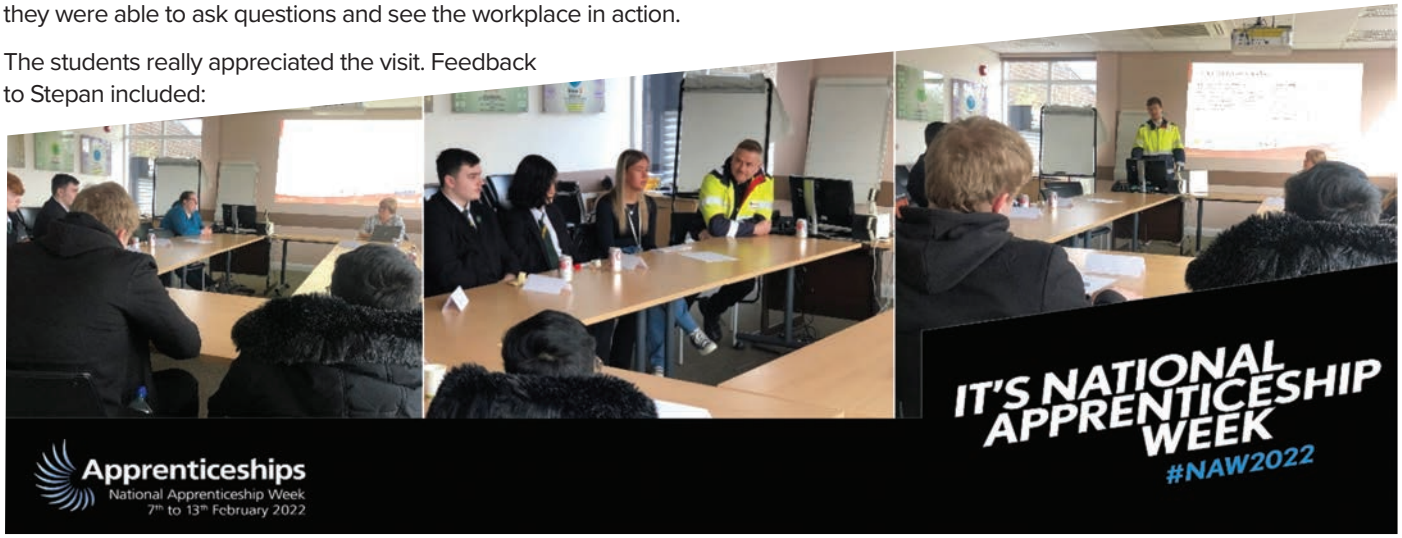
During the visit the students were given a presentation by several employees, from apprentices in the lab and supply chain, to engineers. They then had a site tour and visited the lab, where they were able to ask questions and see the workplace in action.

The students really appreciated the visit. Feedback to Stepan included:

The Careers Leader at the school Tom Eaton said 'Fantastic Viv. Had a quick conversation over lunch with some attendees and they were still excited. These kids have missed out on so much, really great to start opening doors again'.

Helen Littlemore Progress Leader for Year 11 who accompanied the students said 'Really great morning. The kids were fantastic and represented school in such a positive light. Stepan were brilliant, and the employees we met, who shared their different pathway to working for Stepan, were great with the students. I am sure they have gained so much from the visit'.

https://www.stepan.com



RS Clare Appoint New MD

Global manufacturer of advanced lubricants and high-performance greases, RS Clare, is pleased to announce the appointment of David Meadows as Managing Director, effective 1st January 2022. After six years of impressive leadership and consistent growth, Managing Director Paul Vann hands over the reins.

David is now the sixth generation of Meadows' to be appointed Managing Director in the company's prestigious 274-year history. *"It's a huge honour for me to lead this historic and pioneering private family business. I'm excited to be inheriting a very talented team of employees, a global customer base and a supportive and ambitious board to help us achieve further success."*

Over Half a Decade of Solid Growth

The transition comes during a period of strength for the business. Despite the significant challenges faced due to massive global disruption, RS Clare's 2020 financial results reflect the incremental growth and achievements of the last five years, with record turnover and profits reported. David will continue to build on the business's impressive year-on-year growth, with significant plans for strategic investment to maintain a focus on innovation to achieve continued growth in key markets. RS Clare is the longest established company manufacturing lubricants in the UK and the business's continued success is attributed to innovation and a clear focus on delivering high-performance solutions to solve critical problems for their customers. As well as serving the global oil and gas, rail, marine, industrial and thermoplastic markets, RS Clare has also provided private label grease manufacturing services to blue chip multinationals since 1925.

Ready for the New Challenge

David's role as Director, Marketing and Communications has afforded him a deep understanding of RS Clare's customers in each of the business's core markets, and the challenges they face. His position within the company's Executive Board has seen him support the development of overall strategic direction, and the board has every confidence in David's ability to deliver the next phase in the business's growth and investment plans. In addition to David's commercial experience, he also brings a strong technical academic background to the role, with a master's degree in Chemical Engineering earned in Manchester University. He is uniquely placed to have a well-rounded and balanced commercial and technical view of the business.

spotlight *on new member*

Beamex

A better way to calibrate – Since the establishment of Beamex in 1975, the company has focused strongly and consistently on calibration. Beamex is a technology and service company that develops, manufactures and markets high-quality calibration equipment, software, systems and services for the calibration and maintenance of process instruments.

The company is a leading worldwide provider of integrated calibration solutions for improving quality and efficiency. Beamex offers a comprehensive range of products and services—from portable calibrators to workstations, calibration accessories, calibration software, industry-specific solutions and professional services.

Through Beamex's global and competent partner network, Beamex's products and services are available in more than 80 countries. Beamex is certified in accordance with the ISO 9001:2015 quality standard. Over forty years of experience in manufacturing and developing calibration equipment and systems, close co-operation with customers that have high requirements and uncompromising quality standards, shared by the people working at Beamex, are things that have made Beamex's calibration solutions world-class. As a proof of Beamex's success, there are more than 10,000 companies worldwide utilising its calibration solutions.

Beamex's ISO 17025 accredited calibration laboratory is accredited and approved by FINAS (Finnish Accreditation Service). FINAS is a member of all Multilateral Recognition Agreements / Mutual Recognition Arrangements (MLA/MRA) signed by European and other international organizations, i.e. European co-operation for Accreditation (EA), International Laboratory Accreditation Cooperation (ILAC) and International Accreditation Forum Inc. (IAF).

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Pumptec Engineering Services

Pumptec Engineering Services, based in Bromborough in the Wirral has nearly 20 years experience with the North West Chemical Industry. From site work to embedded personnel to full overhauls we specialises in supporting industry with the inspection, repair, overhaul and fitting of all types of rotating equipment. Our highly trained engineers are all mobile and are able to support a myriad of tasks whether that is your routine maintenance, your critical issue call outs, or your planned shutdowns.

For the deeper repairs we have our Wirral based machine shop that can complete overhauls on your pumps, fans, motors and mixers. This can either be on a collection only basis or on a remove, inspect, overhaul and re-fit basis.

Further service lines we offer are HVAC, chillers and refrigeration via our sister company Setaria.

We are proudly independent so have access to the full marketplace for manufacturers and spares. Our service and quality is underpinned by ISO9001, 14001 and 45001 meaning that you can be confident that we will meet your requirements.

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spotlight *on new member*

Mettler-Toledo Ltd

METTLER TOLEDO manufacture & service weighing, analytical and inspection equipment for applications throughout the production cycle, from Research & Development through Production, Quality Control, Storage and Recycling Processes.

In the chemical industry, METTLER TOLEDO's robust, high-performance technology provides scalable, inline measurements of key parameters in real time, helping optimize productivity, process reliability and safety. Our solutions ensure reliable measurement data at the point of need, providing businesses with the reliable measurement data platform required for modern, safe & sustainable chemical processes.

Water forms a key part of many Chemical Processes and METTLER TOLEDO's portfolio of water measurements ensure process, asset and environmental protection throughout the water cycle, including steam, water reduction programs and EfW projects. METTLER TOLEDO also offer off-line analytics for your Laboratory work, providing automation and consistency from development, through scale-up to quality control and C of A data. We provide many of the essential tools for today's scientists including ultra-fast materials analysis, highest precision weighing and fully automated reaction technology.

METTLER TOLEDO industrial scales and load cells come in all sizes and formats, while intuitive terminals and software are used to control and monitor manufacturing processes. Specialized solutions for formulation, vessel contents management and hazardous area applications help to improve productivity and reduce errors in the chemical industry.

The METTLER TOLEDO SERVICE team ensures users get the best from their instrumentation and equipment. Seamless, professional service and maintenance of our technology guarantees optimal equipment uptime, performance, compliance and the expertise necessary to maximize your investment.

METTLER TOLEDO

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Lokring

Lokring has changed the way in which small bore pipework and tubing maintenance, repair and new build construction has been undertaken over the last 30 years.

The mechanical “Cold Weld” Lokring connection offers the same integrity as an ASME B31 coded butt weld, without hot work. NDT inspection and requires less site resources during its install.
Used by leading chemical and petro chemical companies Worldwide, Lokring is helping to drive down maintenance costs and time; whilst improving sites production up time.

Our local technical engineers offer support across the North West and all UK regions, backed up by our Leeds distribution warehouse that can provide same day delivery to deal with those out of hour emergency repairs.

Lokring trains and certifies site mechanical fitters and contractors to effectively undertake installs which can be undertaken on site or within our Leeds and Aberdeen training rooms.

The Covid-19 pandemic has changed the way in which people work and combined with Brexit has impacted on resources available. During this time people have adapted innovative solutions as part of their working practices and daily tasks. We have significantly seen this at Lokring through new customers and adaptation across other industry sectors, especially food and beverage.

From day to day steam leaks, replacement of steam traps, through to chemical process lines, Lokring’s application history consistently shows both cost and time savings to the site, in some cases as much as 75% compared to other traditionally used methods.

Why weld when you can “Cold Weld”.

LOKRING™ UNITED KINGDOM

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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.

Brenntag UK & Ireland
Connects chemical manufacturers and chemical users in a value-adding partnership through tailor-made distribution solutions. Offers specific application technology, extensive technical support and value-added services (i.e. just-in-time delivery, product mixing, formulation, repackaging, inventory management and drum return handling). High safety standards and strives to make served industries sustainable.

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.

Holiferm Ltd
Holiferm uses patented gravity separation technology developed at the University of Manchester to create biosurfactants. These are not only more economically viable, but more environmentally friendly too. Our biosurfactants have applications in many products found around the home including cosmetics, skin care, shower gels and hand cleansers.

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.

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.

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

HTS Engineering Group Ltd
Process safety and safety instrumented systems, delivered with a high level of engineering and expertise with cost efficiency. Four key engineering services that can be tailored individually or as one complete solution: process control & software engineering, engineering & design, site installation and inspection services.

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 ¾” 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.

Michael Smith Engineers Ltd
have been supplying pumps to the UK Chemical industry since 1971.We specialise in sealless pumps and our product range includes gear pumps, centrifugal pumps, high pressure pumps, piston pumps, side-channel pumps, vane pumps, AODD pumps and barrel emptying pumps with thermoplastic, metal or PTFE-lined wetted parts.

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 form 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.

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-wining 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 id 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

ChemQuest Ltd
Sourcing and procurement solutions for research and development. Expertise in biochemical, chemical, nanotechnology, cell cultures, equipment, consumables and sundries. Streamlining and simplification of importing and purchasing processes.

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 ground-breaking 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.

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.

Symmetry Law
Specialist law practice structured to provide "partner" level experts at "junior" level prices, with a focus on the 'high consequence' end of the spectrum. Legal services include: environmental, safety, regulatory, contracts, tax, construction, green incentives, litigation.

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.

Know your supply chains

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.

Stewardship Solutions Ltd
Provision of chemicals regulatory services to organisations across many industry sectors and throughout the world. REACH and CLP compliance is a primary focus, and REACH registrations programmes are a core strength. The company has achieved significant savings in the costs of REACH compliance on behalf of many of its SME clients. Stewardship Solutions is a REACHReady-approved service provider.

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.

Millbank
With over 30 years' experience providing recruitment solutions to major clients in the chemical sector, Millbank has an extensive database of experienced candidates and contractors ready to join projects across the region. A true recruitment partner, Millbank offers services ranging from contract and permanent placements through to fully managed services.

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

Koura

kouraglobal.com

SLR

A global leader in environmental and advisory solutions

We help businesses get the most from their assets by developing people, plant, and management processes to drive sustainable improvements in safety, environmental protection and productivity.

Find out more about how we can help improve your performance

safetyadvisoryeu@slrconsulting.com **www.slrconsulting.com**