Chemicals northwest

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Summer 2021

A unique industry, with unique companies and unique news

Elements

In this issue:

- ***Chemicals Northwest 2021 Award winners Photographs***
- *Special features on:*
  Green chemistry
  Patents
  Sustainability
  Recruitment
  ...and many more engaging news items from our members

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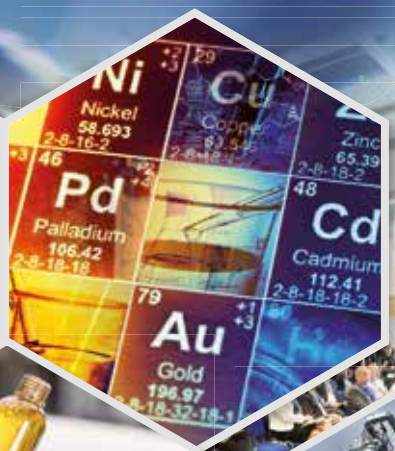

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Contents Summer 2021

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 or please contact:

Alex Abraitis - Member services and events manager
alex.abraitis@chemicalsnorthwest.org.uk or visit:
https://www.cia.org.uk/chemicalsnorthwest/Membership/Benefits-Costs/

2021 rates. ***(from 1st April 2021)***

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 Summer edition of Elements magazine. We hope you are all keeping well.

In this edition of Elements we are delighted to feature our 2021 Award winners receiving their trophies and highly commended certificates. Recognition for our winners is rightly deserved but special thanks and well done go to all of those who entered for the awards and our sponsors, without whom the awards would not be possible.

The team at Chemicals Northwest have been busy over the last quarter planning the Chemicals Northwest 2022 Awards which will be held in Manchester. Due to the "nightingale courts" being held in many of the main hotels until April 2022 we are considering venue options.

We have continued to run our monthly members meetings with topics varying from COVID to trade and business continuity as a result of our departure from the EU. Our virtual breakfast sessions have also continued to thrive. We recently launched a series of "hot topic" events in association with some of our member companies with future topics to follow on NextGenChem in association with the University of Lancaster and a detailed overview and case study on Kickstart in association with the Growth Company. If any members have further topic ideas, please get in touch.

Our LinkedIn Groups have continued to thrive, and we ask member companies if they have any events, news, company updates etc which they would like Chemicals Northwest to promote then please email.

As society opens up again, we are looking forward to hosting and attending events going forward. Particularly CHEMUK 2021 which we are proud to be Headline Partners for. Further details on CHEMUK which is taking place at the NEC in Birmingham on the 15th and 16th September including agendas, exhibitors and any other snippets of information can be found on page 2 and 25 of this edition of Elements.

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/

Take care, stay safe and continue to look after those around you.

Alex Abraitis - **Member Services and Events Manager**

About us...

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

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

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

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

As a result of gradual development over recent years, getting messages across, promoting member companies and reporting news, Chemicals Northwest has reached new levels of topicality and quality. 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 attracting an average of 40 people each time. 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 and now has a membership of over 50 companies.

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 - CNW produces an informative quarterly magazine called Elements which contains the latest round up of member news, specialist features and 'spotlights' on new member companies. 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 - Visits to the CNW website have almost doubled in the past 12 months. 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 has an ever increasing membership, with over 1700 members now connected. The 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 - The CNW Twitter account is growing, so to hear about the latest news from CNW and the wider sector, why not follow us. In addition we'd be happy to re-tweet any news or updates that members themselves tweet.

RAS

RISK & HAZARD MANAGEMENT

Understanding and facilitating the effective management of risk is our core business. Our expertise covers the full range of risk assessment and management services.

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Business Risk

Environment Risk

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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Looking to the Future of DSEAR Compliance

The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) have been around for some time, and those under the scope of them will be well aware of their requirements; demonstrating how the risks associated with flammable atmospheres are identified and managed. We mustn't get complacent though. Industry is changing as we begin to move towards the Net Zero goal, regulation is being revisited as we find our feet with Brexit, and more generally, our knowledge and understanding of flammable atmospheres is increasing as more research is undertaken. It is important that operators keep up to date on what it means to be compliant in an ever-changing world.

Hazard Identification (HAZID) is the starting point of all risk management activity, and DSEAR compliance is no different. Thorough HAZID will make sure that a site's Hazardous Area Classification is comprehensive and that it covers the less obvious risks, such as hydrogen leaks from faulty battery rechargers. It will also capture releases that fall outside of the guidance; those from larger hole sizes or gas generation by accidental material mixing. HAZID in DSEAR compliance is something to bear in mind as we set off on the path to Net Zero. There are significant changes on the horizon as hydrogen is to play a key role in meeting our energy targets, and with that comes new challenges in identifying and managing potential flammable and explosive atmospheres. Operators will have to consider hazards that they had not considered before, so identifying any knowledge gaps will be essential. Now is the time to be prepared, to look out for emerging research and guidance in this area from relevant industry bodies and to become familiar with the challenges these changes will bring to industry.

We know that DSEAR goes beyond Hazardous Area Classification and onto demonstrating that we have the measures in place to manage our risks. The terms DSEAR and ATEX have previously gone hand in hand as the legal frameworks that require us to make that demonstration. Following Brexit, ATEX is no longer recognised in UK law, but it is important to remember that the requirements of the ATEX Workplace Directive (99/92/EC) continue to be implemented in the UK by the DSEAR Regulations. The obligations of the operator, to provide a demonstration that the risks associated with explosive atmospheres are managed, remain unaffected but the removal of ATEX from UK law does present a good opportunity to clear up some confusion over Explosion Protection Documents (EPDs). There has sometimes been a misconception that operators require an EPD, as they are a requirement of the ATEX Workplace Directive. However, the DSEAR Regulations do not specifically require an EPD. As long as the organisation can demonstrate that the requirements of the Regulations are met, then they are compliant. The EPD could be felt to be a 'one size fits all' approach, but UK law gives us more freedom. That does not mean that a standalone document is not a good idea; having all information in one place (for example in a 'DSEAR Compliance Report') is an easier way to demonstrate compliance, particularly on sites not under the scope of other associated regulations (i.e. COMAH). Without the requirement for an EPD, however, COMAH Operators in particular are free from having separate documents with duplicated information; they have the opportunity to provide their demonstration for both DSEAR and COMAH within their Safety Report.

While the requirements of the ATEX Workplace Directive continue to be implemented in the UK by the DSEAR Regulations, equipment certification in line with the ATEX Equipment Directive (94/9/EC) is now no longer recognised. The requirements have been transposed to UK Regulation, meaning that for manufacturers, conformity assessments for equipment must now be carried out by a UK Approved Body. UK type certificates are to be used in place of ATEX Certification and CE labels are to be replaced by UKCA labels (although in most cases, manufacturers are permitted to continue to use CE markings until a transition period ends on 1st January 2022). For the operator, this makes little difference in the short term, as the equipment requirements for the EU and UK equipment certification remain the same.

Operators will always have the responsibility to keep their employees safe by identifying and managing their risks. Though the fundamentals of regulation will remain the same, changes in the industrial and political landscapes mean that operators need to adapt and identify how they can continue to fulfil their responsibilities, and DSEAR compliance is no different.

Jenny Hill and Carolyn Nicholls - enquiries@ras.ltd.uk

RAS

RISK & HAZARD MANAGEMENT

Catalyst Science Discovery Centre and Museum to receive £79,550

from second round of the Government's Culture Recovery Fund

Catalyst Science Discovery Centre and Museum in Widnes has received a grant of £79,550 from the Government's £1.57 billion Culture Recovery Fund to help the organisation recover and reopen after being closed for almost 12 months.

- Catalyst among more than 2,700 recipients to benefit from the latest round of awards from the £1.57 billion Culture Recovery Fund
- This award will ensure the future viability of Catalyst and the protection of its Heritage Offer, Archive and its workforce

More than £300 million has been awarded to thousands of cultural organisations across the country including Catalyst in the latest round of support from the Culture Recovery Fund, the Culture Secretary announced today.

As an independent charitable trust, Catalyst is the only science centre and museum in the UK dedicated to the science and technology behind the chemicals industry and its impact on our lives, past, present and future. Based in a Grade II listed building in Widnes, where the chemical industry flourished for over 170 years, Catalyst holds a unique position as a museum, a national industrial archive and an educational resource. Throughout the pandemic Catalyst has been collaborating with MindHalton on an award-winning programme providing vital mental health support to local people. This award will ensure the future viability of Catalyst and will allow us to continue our MindLab programme for the community.

Over £800 million in grants and loans has already been awarded to support almost 3,800 cinemas, performance venues, museums, heritage sites and other cultural organisations dealing with the immediate challenges of the coronavirus pandemic.

The second round of awards made will help organisations to look ahead to the spring and summer and plan for reopening and recovery. After months of closures and cancellations to contain the virus and save lives, this funding will be a much-needed helping hand for organisations transitioning back to normal in the months ahead.

Culture Secretary, Oliver Dowden, said:

"Our record breaking Culture Recovery Fund has already helped thousands of culture and heritage organisations across the country survive the biggest crisis they've ever faced.

Now we're staying by their side as they prepare to welcome the public back through their doors - helping our cultural gems plan for reopening and thrive in the better times ahead."

Martin Pearson, Catalyst CEO said:

"This latest support from the Culture Recovery Fund is a timely shot in the arm for the future viability of Catalyst and the protection of its workforce. It will allow us to continue working with our local community and particularly our award-winning collaboration with Mind, Halton supporting those who are suffering with their mental health following a very difficult year for everyone.

It will also allow us to continue to preserve our heritage and make our archive available to not only our local community but to those who wish to connect to our historical past from further afield."

Sir Nicholas Serota, Chair, Arts Council England, said:

"Investing in a thriving cultural sector at the heart of communities is a vital part of helping the whole country to recover from the pandemic. These grants will help to re-open theatres, concert halls, and museums and will give artists and companies the opportunity to begin making new work.

We are grateful to the Government for this support and for recognising the paramount importance of culture to our sense of belonging and identity as individuals and as a society."

The funding awarded is from a £400 million pot which was held back last year to ensure the Culture Recovery Fund could continue to help organisations in need as the public health picture changed. The funding has been awarded by Arts Council England, as well as Historic England and National Lottery Heritage Fund and the British Film Institute.

For further details visit https://www.catalyst.org.uk/

2021 Awards

Chemicals northwest

Plans are currently in place to secure a date and venue in Manchester to host the 2022 awards. Please keep an eye on the CNW website and bulletins for the latest 2022 Awards updates.

Manufacturing Company of the Year Award 2021

Sponsored by PM PROjEN

https://www.projen.co.uk/

Winner - 2M Holdings Ltd

https://www.2m-holdings.com/

Adam Parks from 2M Holdings Ltd

Manufacturing, Highly Commended - Libra Speciality Chemicals Limited

https://librachem.co.uk/

Jacob Wylde and Anna Holroyd from Libra Speciality Chemicals Limited

Engineering Firm of the Year 2021

Sponsored by Chemicals Northwest

https://www.cia.org.uk/chemicalsnorthwest/

Winner - Projex Solutions Limited

https://www.projexsolutions.co.uk/

Jamie Ashton and Lynn Bray from Projex Solutions Limited

Health & Safety Award 2021

Sponsored by Livent

https://livent.com/

Winner - Dron & Dickson

https://drondickson.com/Home/Start.aspx

David Minshull and Scott Jennings from Dron & Dickson

Innovation Award 2021

Sponsored by SLR Consulting Limited

https://www.slrconsulting.com/

Winner - Bitrez Limited

https://www.bitrez.com/

Georgia Mackintosh and Paul Jones from Bitrez Limited

Supplier to the Chemical Industry Award 2021

Sponsored by the Chemical Industries Association

https://www.cia.org.uk/

Winner - SLR Consulting Ltd

https://www.slrconsulting.com/

Zak Cunliffe - SLR Consulting Limited

Supplier, Highly Commended - Actikem

https://www.actikem.com/

Audrey Mooney and Andrew Mooney from Actikem

Operational Excellence Award 2021

Sponsored by CF Fertilisers UK Limited

http://www.cffertilisers.co.uk/

Winner - 2M Holdings Ltd

https://www.2m-holdings.com/

Adam Parks from 2M Holdings Ltd

Sustainability Award 2021

Sponsored by INOVYN

https://www.inovyn.com/

Winner - MOF Technologies Ltd

https://www.moftechnologies.com/ *Jose Casaban from MOF Technologies Ltd*

Charity, Highly Commended

http://www.lorellywilson.co.uk/

Lorelly Wilson from Chemistry with Cabbage

Charity of the Year Award 2021

Sponsored by Valtris Specialty Chemicals

https://www.valtris.com/

Winner - Catalyst Science Discovery Centre & Museum

https://www.catalyst.org.uk/

Jade French from Catalyst Science Discovery Centre & Museum

Sustainability, Highly Commended - ABB

https://global.abb/group/en

Young Talent in the Chemical Industry Award 2021

Sponsored by SRG
https://www.srgtalent.com/

Winner - Anna Holroyd (Libra Speciality Chemicals)

https://librachem.co.uk/

Anna Holroyd from Libra Speciality Chemicals

Young Talent, Highly Commended - Henry Truman (GlaxoSmithKline)

https://www.gsk.com/en-gb/home/

Young Talent, Highly Commended - Jacob Wylde (Libra Speciality Chemicals)

https://librachem.co.uk/

International Trade Award 2021

Supported by the Department for International Trade
https://www.gov.uk/government/organisations/department-for-international-trade

Winner - Libra Speciality Chemicals

https://librachem.co.uk/

Anna Holroyd from Libra Speciality Chemicals

Digital transformation of process industries

While the concept of applying digital technologies to improve operational excellence isn't new, in 2019, a staggering US$345 billion was earmarked for digital transformation initiatives in process and manufacturing industries. These investments are considered to be the largest of their kind by any industry worldwide, according to the International Data Corporation (IDC).

Digital Transformation (DX) Opportunities and Challenges

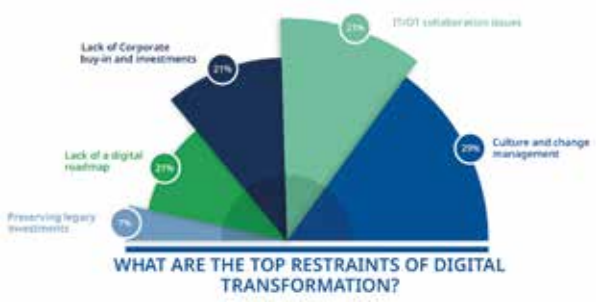
A growing number of industrial companies envisage a digital transformation (DX) in operations and manufacturing to support company-wide growth, innovation, and sustainability strategies. Gartner research suggests that enterprise digitalisation reached a tipping point in 2019, with over 95%

of organisations having initiated CIO-level digitalisation efforts. While according to research conducted by McKinsey & Co., the most potential benefits of digital transformation are increased profitability, reduced costs, and higher productivity, with estimated effects as follows:

Sized Applications	Annually Low Est.	Annually High Est.	Potential Value Gain
Operations Optimization	633	1766	5-12% cost reduction
Predictive Maintenance	240	627	10-40% cost savings
Health and Safety	65	226	10-25% savings
Human Productivity	69	160	10% productivity improvement 3-5% productivity gain

While DX has become a strategic imperative and presents, significant potential benefits, operations must consider risks and margins, especially since more than 70% of DX initiatives have failed. According to Yokogawa's research, the most common restraints associated with DX failures are culture and change management issues, followed by OT/IT collaboration challenges.

Potential Economic Impact Per Year in 2025
Reference: McKinsey & Co.[2]



The Road to Futureproof DX results

While each organisation is different, some industry-wide best practices have proven to work for many and can be easily incorporated by those undertaking their manufacturing DX journey. A summary of industry-wide best practices is described in this article and further information can be obtained from Yokogawa's Digital Transformation in Process Industries eBook.

Align the digital strategy to corporate strategy

Many organisations approach digital transformation as a one-time strategy-development exercise. This often leads to an unclear vision of the organisation's digital element, followed by limited C-level support and IT involvement. To keep up with industry demands, a more strategic approach is needed to link DX objectives to an organisation's business goals and strategy.

Mapping current state capabilities

Organisational strategy, operational challenges, risk appetite and automation ambitions should be the drivers to decide a digital target state roadmap. Maturity models, operational assessments, your focus areas and desired outcomes should be used to guide you to determine an approach for creating value.

Break organisational silos and collaborate

DX, by its very nature, requires people to change their ways of working and break out of organisational silos and into collaboration on key projects. Identify the most influential people at key points across the organisation and invite them to participate in a digital transformation task force, creating buy-in and trust among employees, thus empowering employees to lead DX efforts.

Organise processes around customers

DX requires a mindset and culture that places the market,

customer value, and customer experience first. While evaluating risks and return on DX investment, companies must adopt a perspective that prioritises the market's needs over its departments, fiefdoms, or leaders' needs. Aligning the IT/OT ecosystem to solve customers' unmet needs ensures the best results in executing a DX strategy.

Identify quick wins and estimate benefits

There are always opportunities for quick wins by shedding light on pressing issues that erode operational performance - such as unplanned downtime or problematic equipment. Tackling these issues upfront, creates immediate and measurable benefits, freeing up valuable time for more strategic initiatives.

Build a stable technology foundation and organise your data

Leading companies ensure they have established a stable technology foundation before moving to cross-functional integration and acceleration. Only a data-centred approach to technology can ensure a reliable foundation for applying analytics, application logic, and interoperability.

Partnering to create futureproof results

When done correctly, DX leads to future-proof results. DX is a daunting challenge with many interdependent factors, and there is not a one-size-fits-all solution. Process industry companies need a business partner who believes that innovation is not just a one-off event or project but a change in mindset, organisational culture, and business agility.

Yokogawa offers a Discovery Workshop to introduce a DX Framework for process industries, aligning DX efforts, and creating organisational awareness. It is a starting point to layout a digitalisation roadmap that thoughtfully considers people, processes, technology, assets, and data. Interested in learning more about our DX workshop? Contact us at **uk.marketing@uk.yokogawa.com**

Donal Bourke MSc BA

Donal Bourke is Business Unit Manager for Yokogawa Ireland and Business Development Manager for their Advanced Solutions Consultancy Group in UK and Ireland. He is a graduate of Griffith College Dublin (BA) and also holds an MSc in Information Systems Management from NUI Galway. As business development manager for Yokogawa's Advanced Solutions consultancy group, Donal works with customers in the process manufacturing industries to provide professional services and technologies for IIoT, Cyber Security and Data Analytics.

[2]https://www.mckinsey.com/~/media/McKinsey/Industries/Technology%20Media%20and%20Telecommunications/High%20Tech/Our%20Insights/The%20Internet%20of%20Things%20The%20value%20of%20digitizing%20the%20physical%20world/The-Internet-of-things-Mapping-the-value-beyond-the-hype.pdf

[3]https://www.forbes.com/sites/blakemorgan/2019/09/30/companies-that-failed-at-digital-transformation-and-what-we-can-learn-from-them/?sh=77c93bb603c4

[4]https://info.us.yokogawa.com/digital-transformation-ebook.html

Patenting research outputs – where and when to begin

Before making the leap into patent law, Dr Ian Wilson worked and studied in academia for over a decade. His experiences taught him that scientific advances are often incremental, and few researchers dream of inventing the next big thing. However, anyone, from individual researchers to multi-national corporations, can create and patent an invention. So, at what point should you begin to consider protecting potential outputs from your work? As the newest member of WP Thompson's chemical and life sciences team, Ian, is learning, the earlier the better.

Importance of patents

A patent is a legal document that grants the owner statutory rights to exclusively prevent competitors from producing, using and marketing the patented invention for a limited period of time in regions where the patent is in force. Accordingly, patents may increase the value of the person/company who owns them by inhibiting the actions of potential competitors or provide revenue through licencing options. However, patents are intended to stimulate creativity and invention also, since patents are only granted in exchange for an open and instructive disclosure of the new invention. Thus, potential financial rewards aside, the inability to simply copy competitors' inventions, and the disclosure of innovative research, help drive countless fields of study forward as researchers endeavour to develop their own superior products.

Defining an invention

In its simplest terms, an "invention" must be novel, non-obvious and have an industrial application. Naturally, as I am learning every day, things are considerably and fascinatingly more complex than this but, broadly speaking, patents can apply to an invented product, material or apparatus, or even a process or application. Of course, unlike in industry, academic research often yields inventions as solutions to overcome barriers, rather than as ultimate objectives. It is important then to keep one eye on the future and think about the potential value of your creations.

Collaboration

In my time in academia, I worked with many collaborators, from a wastewater management company to genomic sequencing providers. Research and Development thrives on these collaborative efforts. However, patents are granted on the condition that the invention in question has not previously been disclosed to anyone beyond its inventor(s), even potential investors and manufacturers. This is where identifying an invention early on becomes important. Inventors must consider carefully what information to share with whom. Often, you will hear of collaborators signing a Non-Disclosure Agreement, a legal contract that determines what information can be exchanged confidentially between whom. Hugely important in early stages of development, these contracts go some way to protecting inventors until they are ready to go public with their invention.

Going public

From scientific journal articles to conference presentations, there are many places to promote research. However, even your own findings could render your invention unpatentable if disclosed before a patent application is filed. To protect your invention, an initial "priority" application must first be filed. This shows the world that you "created" your invention on the priority filing date, preventing competitors from beating you to the punch. Meanwhile, additional patent applications adding further details or covering other jurisdictions may be filed within the first year, giving you time to gather data to support your patent application. That data is often key to a good patent application, as we will explore in a future issue of Elements.

The power of patents

There are myriad factors to be considered where patents are concerned, beyond even those covered by the scope of this article. What I have seen – and what I hope you take away from this – is that it really is never too early to start thinking about patenting your research outputs. Your invention could prove a valuable asset and protecting it could help drive innovation in your field. As I said, patents offer protection, but they also stimulate the creativity on which scientific research depends.

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

WP THOMPSON
INTELLECTUAL PROPERTY

North West Innovators

To achieve Net Zero by 2050, it is essential that the major industrial hubs such as the North West push ahead with the development and implementation of renewable energy and carbon capture schemes. It is evident that hydrogen will play a vital role in this drive towards cleaner energy for businesses and the wider community.

In the Spring issue of "Elements", class-leading UKAS-accredited Inspection and NDT provider, Axiom Engineering Associates Ltd, discussed the integrity challenges associated with 'unwanted' hydrogen in existing process applications. 'Pure' hydrogen does however have the power to be transformative, with its harnessing as a means of generating clean, sustainable energy, at the forefront of industry's thinking as we progress towards Net Zero. Manchester Metropolitan University has partnered in a collaborative project with the expertise from SMEs to much larger companies in the creation of the city's first low carbon hydrogen hub. This will be in addition to Trafford Low Carbon Energy Park which already operates other Net Zero projects aligned with the UK Government goals.

This collaborative approach ensures that the best minds, from both academia and industry, are harnessed to address the climate emergency whilst ensuring that a range of stakeholders play a central role in the energy transition. This also presents pioneering opportunities for regional economies involved in the Process sector and the UK plc. as a whole.

A key takeaway from the work being spearheaded in such initiatives, is the use of process simulation to essentially filter the myriad of options being put forward to generate Hydrogen, or to improve its production efficiency, and deal with carbon capture. What Axiom knows from experience is that once a potential process innovation shows promise then the next stage will invariably involve multi-discipline feasibility studies.

Material selection, as discussed previously by Axiom, is a key consideration, as is how pressure systems are designed to cater for what may be challenging pressures, loadings and temperature burdens. The re-use, and re-purpose, of existing infrastructure in the deployment of new solutions is another technical challenge which relies on detailed domain knowledge.

Axiom has already engaged in advising and supporting emerging companies involved in renewables and green technology solutions. With their regional base in Runcorn already delivering localised value-added support to a growing portfolio of clients in the North West, Axiom are well-placed to support the development needs of a hydrogen-based economy.

We can be rest assured that the proactive approach adopted by the North West will place the region at the forefront of the UK's drive towards a cleaner and sustainable industry. With collaboration between the know-how of businesses such as Axiom and academia, the challenging targets set for the North West to achieve Net Zero carbon emissions are highly achievable.

For further details, please contact http://www.ax-ea.co.uk/ or email info@ax-ea.co.uk

The typical week of a young sustainability professional

I graduated in the summer of 2016 with a Masters' degree in Chemistry, from there I started my career at Intertek in the Regulatory Affairs team with a focus on supporting clients in the Chemical Industry. Recently I made a strategic move to refocus my career into sustainability. For the past 6 months I have been reading into the various sustainability issues which are currently "hot topics" in the industry, I have found this both fascinating and deeply refreshing. After finalising my decision to change career paths I was very lucky to be offered the opportunity of a brief secondment with the sustainability team and became a full-time member of the team at the beginning of the year.

As a Sustainability Consultant in the Intertek Health, Environmental and Regulatory Services business each day is different which allows me to learn and grow - in many cases making a positive impact on the sustainability goals of my clients. The team focusses on helping organisations develop and manage their sustainability initiatives. We work together closely as a global team with hubs on both sides of the Atlantic to deliver a wide range of expertise so we can deliver effective solutions to our board portfolio of clients and share and develop our knowledge, to ensure we are leading the way in making a difference.

As the 'conscious consumer' movement grows, environmental impacts from brands and companies are now being looked at closer and more conscious buying behaviours have been adopted thus industry is making sustainability a core focus, to reduce impact on the environment. I am driven by the will to make a difference and help clients achieve these sustainability goals. It is a very exciting time to embark in this field.

My training to become an auditor started a few weeks ago, and I may not have appreciated the depth, breadth and comprehensive nature of the requirements at the time (spanning Quality Management Systems, Environmental Management Systems and procurement and supply chain reviews, to Carbon footprinting activities, management of water, waste, and also development of staff and engagement with local communities... Just to name a few!).

My role as a Sustainability Consultant is predominantly focussed on the delivery of projects under the Framework Standard for Responsible Sourcing of Construction Products, BES6001; and Eco Reinforcement, the steel reinforcement sector-specific standard based on BES6001.

This week I am starting to assist our Senior Technical expert with the delivery of Life Cycle Assessment and Carbon Accounting projects in earnest as my initial training is over. The standard approach is to ensure data quality collection is given a high proportion of time and resources to ensure the highest possible degree of quality results. I'm very excited to learn and develop skills in the specialist SimaPro software and hopefully apply my knowledge of the ISO 14040 series (Environmental management — Life cycle assessment — Principles and framework) - which is a new world of standardisation for me. Luckily, I have a little experience in Science Based Targets that are relevant to GHG and zero emissions so will be able to follow the terminology in these projects.

Apart from the auditing training and LCA immersion work I am also lucky to be involved in a project delivering consultancy on Materiality Assessment (sustainability journeys start by establishing what issues are material to the client's business sector but also to their company's strategy and overlaying that with the perspective of broader stakeholder groups). Projects such as this are great and enable me to develop a sound knowledge and understanding of the variety of ways that are possible to deliver results clients typically seek without always understanding their options and steps to take to arrive at these. One client even said what I thought - sustainability is huge....it is! The mapping of the landscape of opportunities is new and exciting every time I join a project meeting with our experts presenting variety of approaches relevant to the client's degree of ambition and resources reflecting current industry trends.

One of my current projects involves assisting the Senior Team on a project for a Central European based beauty brand. The client has developed an in-house sustainability tool to enable assessment of their product range against carbon, water, biodegradability and eco-toxicity and other

impact categories aligned with LCA. I have just been given a quick tour of the tools our team has designed and delivered to give me a little deeper appreciation on functionality. The key outcome of this project is to provide a third-party verification to ensure independence, rigor and robustness. As the chosen expert service provider, it has been our responsibility to independently review and undertake assurance of the tool. This, in turn, will give the client an increased confidence when sharing their product assessment reviews with their stakeholders and a competitive edge in a busy global end market. The client and their consultant had to first demonstrate the tool. Then we had a brainstorming session to identify strengths, weaknesses, opportunities and threats and agreed on a delivery strategy. The timetable has been affected by team members absence – typical office reality. During the course of the project to date, I have learnt what an assurance review consists of, the different levels of assurance which can be provided through verification, and the need for Environmental claims following standards (ie ISO 14021: Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)).

Our Responsible Sourcing business has existing projects assessing construction products manufacturers this week, so I have been working on evidence review (preparing gap analysis) which will lead into a report and the assignment of credits that will determine their performance level – I think they are aiming at Very Good to outcompete their peers. Next month, I will be taking my project through to internal technical verification, once the client addresses any clarifications/missing evidence. Each audit presents its own individual challenges and learnings when interpreting Standards requirements within individual client's operations and location (last month we had our first certificate issued in UAE and I am getting a project on the way in Spain).

Communicating with clients on data and information is certainly top focus as progress can only be made if clients submit appropriate evidence – that can be technical in nature, such as lack of evidence, or managing client expectations of possible credits, or development of communication strategies to account for the language capabilities of each party.

Being a part of the sustainability team in Intertek is a new journey and already rewarding, every day presents interesting opportunities to develop professionally within a growing industry under the guidance of, and collaboration with experienced professionals.

For further details visit http://www.intertek.com/ or contact Emma Green, Sustainability Consultant, Health, Environmental and Regulatory Services, emma.green@intertek.com; Direct, 0161 2458073, mobile 07484 503640.

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Developing and patenting 'green' chemical innovation: drivers, trends, considerations, growth areas

Over the years, the chemical industry has been 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 and microplastics in the oceans and the amount of unrecyclable packaging and composite goods in the UK (and global) market is having a particularly negative impact on the reputation of the industry.

Changes in the chemical sector are coming fast-driven not only by national and international legislation but also by the detrimental effect a lack of Green credentials can have on an organisation's commercial reputation.

The chemical industry is responding; its innovators are creating new products and processes designed to reduce the industry's negative environmental impact.

There are many sectors in which companies are inventing and patenting green technologies. In the chemical field, there is considerable activity in relation to carbon dioxide gas reduction, developing sustainable non-polluting processes and using alternatives to fossil fuels.

Patent applications related to 'green' innovations are rising, and are predicted to increase

The World Intellectual Property Organisation (WIPO) has recently called for a much-needed boost in environmental-related technology innovation by working 'together to create a green-tech innovation surge that meets the requirement of our times'. The statement followed analysis published by WIPO showing a rise in green patent applications, and an underlying expectation for continued growth in the future.

The United Nations defines Green technologies as those that "protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual waste in a more acceptable manner than the technologies for which they were substitutes".[2]

Patenting green inventions is a way for inventors/companies to secure the commercial benefit of their innovation, and to offset research and development costs. Patents are key to a sustainable business model, as companies can stop competitors from making, using, selling or importing their patent-protected products or processes.

In the UK, green technologies can be filed using the **UK Intellectual Property Office (UKIPO) Green Channel**. This route offers an accelerated patent process where the applicant "makes a reasonable assertion that the invention has some environmental benefit". The benefit does not have to be completely self-evident (for example, solar panels or wind turbines), and can be an application associated with green technology. For example, a simple manufacturing process that uses less energy relative to another would be eligible for filing through the Green Channel.

Special considerations when patenting 'green' chemical innovations

The evolution of our environmental understanding has led to an easy recognition of the benefits of biodegradability, sustainability and reduced toxicity. Patent examiners readily recognise these as technical goals in and of themselves. As a result, patenting in this area need not necessarily require inventiveness associated with more efficacious or improved products or processes etc but potentially equivalent or even less efficacious ones that have instead unexpected benefits in biodegradability, sustainability, toxicity etc.

A significant area of patenting in the future will relate to the impact of synthetic products throughout their lifecycle. In other words, how does production and after end-of-product life impact the environment? We expect this to be a growing area of future innovation which will compliment and run alongside innovation directly relating to product or process utility.

Green chemical innovation growth areas

Carbon dioxide – lowering, capturing carbon emissions

Carbon dioxide produced from burning fossil fuels was first linked to causing a warming effect in 1896. Over a century later, scientists are still striving to find ways in which to lower the level of carbon dioxide in the atmosphere.[1]

Carbon dioxide reduction includes methods of carbon capture and storage (CCS). CCS involves trapping the carbon dioxide at its emission source, transporting it to a storage location (usually deep underground) and isolating it. CCS techniques are under constant development driven by the need to improve separation of carbon dioxide from non-greenhouse gases and reducing the ultimate cost of capture.

Other capturing techniques involve incorporation of carbon dioxide into existing polymeric materials. For example, polyurethanes may be produced using polycarbonate and polyether carbonate polyols that incorporate carbon dioxide into the carbonate backbone. Such use of carbon dioxide not only prevents its escape into the atmosphere but also utilises it in a practical application thus making capture more economically viable.

Biofuels

Fossil fuels continue to be our primary source for energy and feedstock chemicals. Global carbon emissions from fossil fuels account for ninety percent of all emissions from human activity.[3] Biofuels can play an essential role in reducing carbon emissions from transportation and are an important form of renewable energy. Examples of biofuels include biodiesel, bioalcohols, bio-dimethyl ether, bio-oil, biogas and biohydrogen.[4] Their production often involves innovative catalytic process technology. In addition, their use may involve a range of additives to reproduce or harness performance.

Biofuels are not without problems. Biofuels have a lower energy density and are often made from potential food crops or grown where a food crop could be grown instead. Current research is aiming to develop more sustainable and efficient biofuels, known as advanced biofuels from non-edible, lignocellulosic (woody) biomass, such as agricultural wastes or forestry residues.[5]

Hydrogen

Hydrogen is carbon-free, non-toxic, and can be used to generate heat or electricity wherever it is needed leaving behind only water vapour or molecular oxygen rendering the process environmentally benign. However, an on-going issue is how to make it in the first place. Most hydrogen today is still generated by heating coal and natural gas with steam, but this process emits significant amounts of carbon dioxide, potentially nullifying hydrogen's eco-credentials.[6]

This method could be coupled with carbon capture and storage technology, however firstly, further research is focusing on the development of efficient catalysts for use in electrolysis of water, a process in which molecular oxygen is the only by-product. The widespread use of fuel cells will likely lead to new innovations related to their use such as from adaptation of the materials of production for longevity to novel gasket seals for the interfaces.

Improvements to existing technologies

As well as the development of new products and processes such as those described above, a great many inventions arise from improvements made to existing products and processes in order to reduce energy use, avoid harmful by-products and minimise waste.

The Future

As outlined above, we expect to continue to see an increase in green innovation in the industrial chemical field driven by political pressure, legislation and consumer expectation.

David Walsh is a partner at Appleyard Lees IP LLP. He is a UK and European Patent Attorney specialising in the fields of polymers, pharmaceuticals, catalysis, process technology, sealing technology and industrial biotechnology. David has a PhD in surface chemistry from UCL.

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Patent Box scheme

As provided in the recent UK budget announcement, the UK corporation tax rate is set to rise from 19 to 25 percent from 1 April 2023. As a result, companies should now be thinking about whether they can make use of the tax relief provided by the Patent Box scheme.

In episode 15 of The Greenshoots Podcast by intellectual property firm Appleyard Lees, partner and patent attorney David Walsh is joined by Tom Dewes, Patent Box specialist and corporate tax partner with leading audit, tax and consulting firm RSM. David and Tom discuss: What is Patent Box? | How does a company qualify for Patent Box? | How is the tax relief accrued? | What types of patents does the tax relief apply to? | Can multinational organisations benefit from the tax relief?

Alternatively, this briefing note outlines key areas for consideration.

Claims Defensibility

The Health and Safety at Work Act 1973 places a significant level of responsibility on employers to ensure their employees operate in a safe working environment whilst following safe working practices, and courts seem to be imposing strict liability – i.e., the employer has failed to provide either a safe place of work or safe working practices if an accident has occurred, and so liability attaches to the employer for the injuries sustained.

Some companies will be familiar with a scenario where an employee has been injured at work as a result of doing something on their own accord that is outside their job description or usual duties, yet their insurers have still paid an Employers Liability claim, with perhaps only a small amount of contributory negligence attaching to the employee.

Insurers are often accused of settling these claims too easily, but in most cases, the issue is the lack of evidence available to defend the claim, and in the event of legal proceedings being issued, it's often more commercially prudent to settle the claim given the lack of evidence rather than incur even more costs if the claim goes to court.

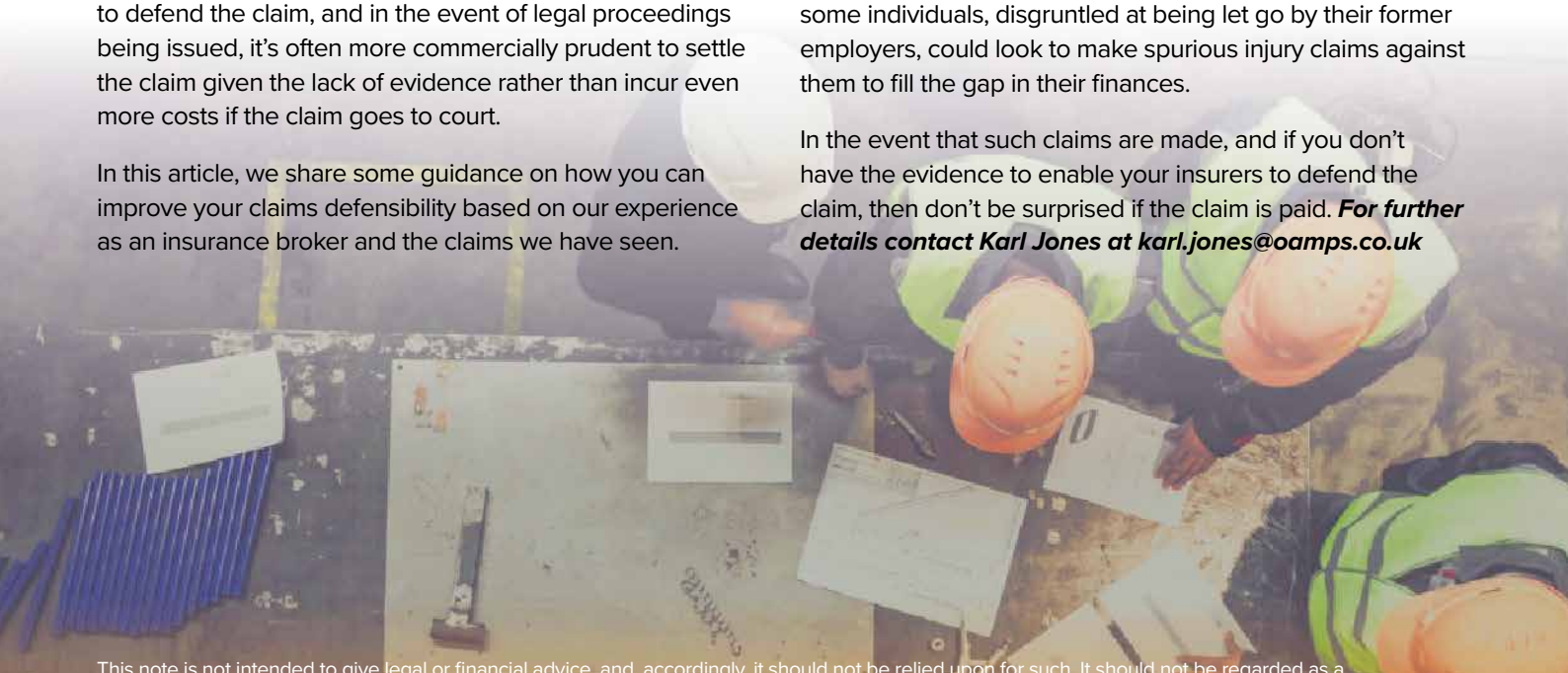
In this article, we share some guidance on how you can improve your claims defensibility based on our experience as an insurance broker and the claims we have seen.

So, what can you do

- Record the details of training being provided, the date on which the training activity was carried out and a statement (or test) to confirm the employee has understood and will abide by this training.
- Record relevant risk assessments/method statement for employees usual tasks & processes and review periodically, especially if there are changes to your business.
- Have a formal induction plan for new employees (including temporary or agency staff) & relevant training applied consistently (and suitably recorded and reviewed/updated periodically).
- Get employees to sign to say they've received PPE, that know they should use it, and ensure the use of PPE is enforced at local management/team leader/supervisor level.
- Encourage a culture where employees are encouraged to report near miss events.

With the financial impact of the pandemic likely to be felt by many businesses in the coming months, employers could find themselves unable to retain staff in what are likely to be challenging trading conditions, and it's certainly possible that some individuals, disgruntled at being let go by their former employers, could look to make spurious injury claims against them to fill the gap in their finances.

In the event that such claims are made, and if you don't have the evidence to enable your insurers to defend the claim, then don't be surprised if the claim is paid. ***For further details contact Karl Jones at karl.jones@oamps.co.uk***



The Chemical Industry and the Rise of Cybersecurity Risk

The Colonial Pipeline shutdown has significantly impacted enterprise functions, critical infrastructure and industrial operations, forcing substantial parts of the pipeline to shut down for several days.

This cyber attack has far-reaching implications not only in the oil and gas market but across several industries, including oil, gas and chemicals, among others. This strategic attack is an example of how cyber criminals can swiftly disable operations and effectively impact businesses, the public and a Nation's economy.

As companies recover from the attack, business leaders are correctly asking the question: Is this the new normal? No industry is safe in a world where connectivity drives business and the chemical industry presents an especially attractive target for cyber criminals for the high impact a cyber attack can have on public safety and operations.

Market changes are increasing vulnerability

Three fundamental shifts in the market have led to this vulnerability.

First, cyber criminals have begun to move their attacks from traditional Information Technology (IT) networks – those made up of the servers, computers and mobile devices that enable business operations – to Operational Technology (OT) targets, which are the machines, systems and networks that are directly used at plants and in operations. Essentially, these are physical infrastructures and digital inputs that make manufacturing and business happen.

OT is a new kind of prize. Instead of stealing and manipulating data, cyber attackers now want to take direct control of your operations. This includes shutting down, over-speeding, overloading and disrupting networks, systems and equipment fundamental for your daily operations. When exploits occur at any point on the OT network, threats can easily spread to other devices. Industrial cybersecurity is now an operational and safety risk.

Second, many chemical companies are embracing digitalization of their operations. Digitalization promises significant increases in efficiency and profitability through the modernization of technology, advanced analytics and automation. Although it represents a competitive advantage in the market, it also brings new cyber risks. Connectivity increases as more sensors, devices and the Industrial Internet of Things (IIoT) are added to the operational network. This expands the points-of-exploitation for attackers.

Third, cyber attackers are realizing that OT systems present the ability to have critical impacts. They can expand from not only stealing, disrupting and destroying data, to directly impacting critical operations and safety. These not only raise the profile of their attacks but increase the profitability and value of their exploitations.

What you can do

Basic cyber hygiene can go a long way to reduce your industrial cyber risk. Here are some cyber basics to keep in mind:

- **Take industrial cyber seriously** – Industrial cybersecurity is a business imperative. It is as important to your growth as any strategic investment. Make sure you have the program, investment and capabilities in place to minimize your OT cyber risk.
- **Know what to protect** – Make sure you have a robust and automated asset inventory and management system. This will let you know what you need to protect, and what systems are connected.
- **Manage your vulnerabilities** – Once you know what to protect, know the holes in your defenses. Prioritize those holes and close them.
- **Cyber starts from the beginning** – Cyber begins from the concept phase. Make sure security-by-design and supply chain risk management is a core part of your new construction and expansion.
- **It's about visibility and control** – Make sure you have a robust monitoring and response program. Without these, you're flying blind.
- **Find the right partner** – Industrial cyber is a challenge. It takes domain expertise and a solution built specifically for the OT environment. OT cyber is likely not your core business. Find a partner who has the experience and expertise in OT cyber to minimize your risk.

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ITAC expand their testing capacity to include flammability testing

ITAC employ a variety of testing methods to develop adhesive coating products that align with their customer's application requirements. This area of work ensures reliability and uniformity in the bonding process within parameters that may also influence performance including consistency of raw materials, application substrates, environmental conditions, and joint design. The results of these tests support the customer to choose the best adhesive coating system for a specific application and helps optimise the formulation process to ensure product specifications are achieved.

The business has expanded its testing capacity to include flammability testing which is an essential part of ensuring the fire safety of the public at large and end-product users. Flammability testing can also limit the risk to manufacturers from action being taken against them by regulatory authorities due to failure to comply with relevant standards. Although figures have come down in recent years, the UK Home Office still reported 316 fire-related deaths resulting from 36,283 dwelling fires in 2019. This, together with the Grenfell tower fire tragedy in 2017, has placed a razor-sharp focus on the requirements for establishing minimum flammability requirements for various materials and finished products.

Much of the material making up our physical surroundings, and the everyday products we use, consist of polymers that are organic and hydrocarbon in their molecular nature. This renders them a good fuel for fire so makes them naturally flammable. In fact, as polymer structures increase in complexity, so does their reaction to combustion. For example, polyurethanes which are used in an array of products across multiple industries, suffer serious flammability issues, and experience rapid decomposition which releases large amounts of heat during combustion.

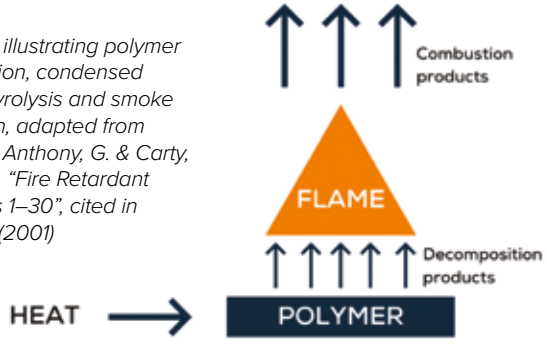

Diagram illustrating polymer combustion, condensed phase pyrolysis and smoke formation, adapted from Price, D., Anthony, G. & Carty, P., (2001), "Fire Retardant Materials 1–30", cited in Elsevier, (2001)

With the UK producing 1.8 million tonnes of plastic materials alone per year, we are posed with the major challenge of rendering these materials less flammable. Fire retardant additives are commonly added to polymer materials to improve their flammability properties. These work to interrupt the cycle of combustion by altering the combustible substrate or fuel source, by lowering the heat of combustion to unsustainable levels, or by altering the oxidizing gas. Another chemical mechanism used is the formation of a physical barrier to protect the polymeric substrate when it is exposed to a source of ignition. The solid layer formed is carbonaceous and acts to push the flames away from direct contact with the substrate, whilst also helping to trap volatile gases that would otherwise serve as a fuel source. It is important to remember at this point that flame retardants do not necessarily prevent fires; instead, they are designed to slow down the rate of flame spread.

The flammability of a material can be described as how easily it will burn or ignite to cause fire or combustion. These characteristics are measured through flammability testing and several protocols are used to quantify a material or product's susceptibility to ignition, tendency to combust, and the rate of flame spread once it is ignited. ITAC are well equipped to develop and test a range of fire retardant coating formulations designed to reduce the flammability of a range of substrates. The resulting fire safety characteristics of substrates tested depends significantly on the coating formulation.

With their flammability chamber, ITAC use Federal Aviation Regulation (FAR) testing methods. These are intended to determine the resistance of material to flame over varying periods of time and across several different test geometries. They include vertical, horizontal and 45° flammability testing which provide information on different parameters such as flame time, drip time, burn length, burn rate, glow rate and flame penetration.

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

Hazardous materials containment – why routine inspections are essential for minimising environmental risk

This article discusses secondary and tertiary containment systems for hazardous liquids, highlighting why regular auditing and inspection is vital to minimise the potential effects of major incidents and pollution events.

Major incidents and numerous pollution events over the years have highlighted deficiencies in the way hazardous liquids are stored and the harm such incidents can cause to the environment, people, and property.

Secondary and tertiary containment systems are installed on sites to prevent substances from escaping into the environment and causing a major accident or pollution incident and provide greater control in the management of associated hazards. The types of secondary and tertiary containment that can be used include bunds, integral containment, buildings, interceptors, catchment tanks, or barriers such as penstock valves.

Site owners and operators are required to prevent the escape of potentially polluting liquids into the environment. Failure to provide and maintain effective containment measures can result in enforcement action, financial penalties, and personal liability of company Directors.

Relevant good practice guidance such as CIRIA C736 and the Landfill ICoP on containment all recommend periodic inspection, gap analysis and improvement programmes for existing containment systems. Undertaking inspections and actioning their recommendations can result in owners and operators avoiding the need to construct expensive, new, large-scale infrastructure by improving and maintaining facilities that are already in place.

It is also expected that the Environment Agency are to formalise draft guidance for 'Appropriate measures for the biological treatment of waste' which will require a chartered or structural engineer to validate the secondary and tertiary containment systems for biological waste sites.

The importance of regular inspection and maintenance plans

Over the operating life, plant, equipment, and structures may exhibit signs of ageing, which can compromise safety and reliability. Knowing what, when, where and how they should be inspected and maintained is therefore essential for maintaining safe and compliant operations. Effective maintenance requires the right task to be done correctly at the right time, each and every time, so it's important that competent people are responsible for this.

Physical inspections are a key tool to maintain containment integrity and undertaking regular inspections can detect any signs of potential or existing leaks, cracks and corrosion etc.

The Control of Major Accident Hazards Regulations (COMAH), the Environmental Permitting Regulations (EPR), and Appropriate Measures for the Biological Treatment of Waste in England require sites to ensure that adequate inspection and maintenance procedures are in place, along with a testing regime, and that any defects are managed in an appropriate way.

The CIRIA C736 guidance recommends that assets should be uniquely identified on an asset register, which provides a basis for inspection and maintenance planning programmes. Feasible plans and schedules should be developed to execute those programmes and should be approved by specific named competent people.

Process risks, and loss of containment scenarios in particular, should be identified via installation specific hazard studies. These should be carried out in accordance with recognised standards or codes of practice, and include, but not be limited to, such studies as hazard identification (e.g. HAZOP, HAZID), functional safety assessment, layers of protection analysis etc.

Gap analysis

By undertaking a gap analysis of existing installations against legislation and recommended good practice, shortcomings can be identified which will inform any necessary improvement plans. Where practicable, these shortcomings should be addressed. However, if it is not considered practical then alternative measures should be implemented such as tertiary containment to reduce the risk sufficiently to satisfy the law.

It is essential that all duty holders understand the risks that can be posed to people and the environment, both within and external to the establishment boundary. With fewer new containment facilities being built in recent years, it is important to have established inspection, maintenance and upgrading plans in place to maintain the integrity of existing facilities to continue to meet any minimum legislative or regulatory requirements.

For further details contact Kris Ellenthorpe, Principal Consultant, SLR Consulting or visit https://www.slrconsulting.com/

Employee benefits versus job tools – take time to understand the difference

Employee benefits play a significant role in attracting and retaining key talent, yet many companies continue to get their priorities wrong in this area. We see so many examples of companies listing their benefits as smart phones and laptops, company cars but these are the fundamental tools needed to do your job.

In a survey by Glassdoor 60% of employees reported that having an excellent benefits package was an important factor when deciding if they should accept a job offer or not.

We know there are companies out there that offer exceptional benefits packages, such as Google which provides free lunches cooked by a gourmet chef as well as onsite medical services. We also know that not everyone can compete at this level but it's surprising how far a few carefully selected benefits can go towards increasing employee retention and happiness.

Offering your employees a few additional benefits that they value instead of just the basic no frills package can have a big impact, @WorkWellMass said: “While employee perks are great, they only work if they are actually what your employees want. Do some digging first before you assume!”

Aside from the obvious free benefits, consider such things like hybrid and flexible working which is highly valued by employees particularly as we return from enforced homeworking for so many. People want the option to work in the office and also remotely to create a better balance in their lives.

Let us take a look at three UK companies that offer benefits which we think are interesting.

Salesforce

Salesforce ranks as the number 1 company to work for in the UK. They are known for having a strong focus on health and wellness. Salesforce also offers benefits including parental leave - for up to 3 months, private medical insurance, monthly wellness reimbursement which can be spent on gym membership or glasses, massages etc. This is a company that knows employees that look after themselves physically and mentally will be more engaged and productive at work. Employees of salesforce can also benefit from help towards studying to improve their qualifications through a reimbursement program up to £5000 and a solid pension package.

Cisco

The company ranked as the second best to work for in the UK is Cisco. Cisco employees will get reasonable pay which is checked against market data for 50 comparable companies and moved up in line with the rest of the industry. Cisco also believes in hybrid and flexible working to help their employees achieve a great work/life balance. Aside from a salary package assessed yearly, Cisco also offers significant benefits including discounts off leading brands and family orientated activities. Every employee can also take up to 5 days off paid per year to volunteer. Similar to Salesforce, wellbeing is also a key benefit for employees and the company offers subsidised gym membership and free health check-ups as well as private medical insurance and dental cover. Cisco employees have also reported they receive a performance related bonus which motivates them to achieve their key objectives at work.

Hilton

Hilton, famous for its chain of hotels across the globe, was ranked third in the top places to work 2020. One of their top benefits as you can probably imagine is the fantastic staff discount they offer on stays at their hotels, free use of gym and wellbeing facilities. The hotel giant also offers dental and medical cover for employees. Hilton’s staff also receive a good pension package and non-hotel key staff are encouraged to work at home. Employees have also stated Hilton offers excellent programmes for career advancement such as management training programmes.

These are just three examples of big brand names that understand the value of looking after their employees by providing a variety of benefits that their staff value. The most important thing is to do your homework and ask your staff, and act on advice and suggestions made. If you are considering the benefits options available in the market, do feel free to get in touch at hello@rmg-uk.com. We know a number of providers that our clients have used who would be happy to help you. A quick conversation with a specialist could go a long way.

CHEMUK 2021 Preview – Bringing the Chemical Industries back together this September

The CHEMUK 2021 supply-chain expo and speaker programme returns on the 15th & 16th September 2021 at the NEC in Birmingham.

CHEMUK 2021 will bring together the UK's chemicals, chemical & BIO-Chem processing, and chemical product formulation industries, providing an intensive 2-day supply chain sourcing, business networking, intelligence gathering, best-practice and strategy development experience.

NEW FOR 2021 will be the 'CHEMSOURCE' Zone that will see an expansion of the exhibits space and speaker programme coverage, relating to chemicals, ingredients & raw materials supply chain & sourcing.

2-DAY CHEMICAL INDUSTRIES SUPPLY CHAIN EXPO
CHEMUK 2021 will provide visitor groups with a diverse and impressive showcase of 300+ specialist exhibitors showcasing latest plant, equipment, materials and services supporting the chemicals industries, driving product innovation, plant & process performance, future proofing, supply-chain fulfilment, safety, compliance and more.

Speaker Programme
The 2-day speaker programme hosted across four open stages will deliver some 40+ hours of free to attend expert intelligence, case studies, best practice and tech-insight 'snapshots', to inspire and assist next level investment and operational strategies for attending industry groups across the UK chemicals & chemical product sectors.

Centre stage will be critical themes such as process innovation, improvement & intensification, sustainability & responsible care, digitisation, new technology, plant & supply chain management, process safety, UK REACH & regulatory landscape, global trade, sector skills, Brexit and more.

Headline Contributing Bodies
Just some of the big names & leading sector bodies down to present or host special sessions in 2021 include the likes of; BASF Plc, BioVale, Chemical Business Association, Chemical Industries Association, The KTN, Royal Society of Chemistry, Accenture, Hazchem Network, GAMBICA, Siemens, ABB, BASA, Defra, CPI, IChemE Safety Centre, Cogent Skills, CATCH, TSA, SIA, OCCA just to name a few...

Sectors in Focus
Programmes will address the needs of the diverse industrial chemicals development, processing & distribution sectors, from commodity to fine & speciality chemicals, intermediates, dyestuffs, additives, bio-based chemicals etc.

Downstream formulated-product sector coverage will include Cosmetics & Personal Care, Surface Treatment products, Adhesives & Sealants, Plastics, Lubricants, Pest Control Products, Paper & Pulp sector, Cosmeceuticals, Paints, Inks & Coatings, Solvents, and more, as well as key 'breaking markets'

Full 2-day programmes will be available from June 2021 at www.chemicalukexpo.com

WHO SHOULD VISIT?
CHEMUK 2021 reaches out to all key chemicals/chemical product & chemical using industries, **targeting Chemical Process Engineers, Operational, HS&E, Control & Instrumentation, Test & Inspection, Manufacturing, Formulation, Logistics, Procurement & Supply Chain, R&D & Scientific professionals plus Chemical industry business teams.**

Organisers are anticipating attendee groups from across the broad industrial chemicals manufacturing & distribution sectors, from petrochemicals & base chemicals, to fine & speciality, intermediates & additives, polymers, inorganics, dyes, pigments, green chemicals, process chemicals and more.

Equally, the event provides **chemical-based formulated** product industries, from the cosmetics & personal care industries to paints & coatings, household & industrial cleaning, pharmaceuticals, water treatment, plastics and others, with crucial access to supply chain raw materials, chemical product processing plant, technologies & support services.

Here's what they said...
"Given the importance of the chemical sector to the UK economy, it is vital that the sector is represented by one integrated, supply chain event which is why CHEMUK is so key to the way in which we present our industry and engage with our regulators, suppliers and distributors."
David Wright, Director General, UK Lubricants Association UKLA

"Exciting new event that gives companies the tools to ensure they are complaint with the regulations. A fantastic line up of speakers who provide such valuable insight into the regulations."
Caroline Raine, Consultancy, Chairman, British Association of Dangerous Goods Professionals

"A standout UK chemical event in particular for the quantity, quality and variety of the speaker program which resulted in an informative and inspiring two days."
Paul Spencer, Product Development Manager, Gurit UK.

DATES FOR THE DIARY
CHEMUK 2021 takes place on Wed 15th & Thu 16th September 2021

Venue: NEC - National Exhibition Centre, Birmingham, B40 1NT

Opening Times:
Day 1 : 9.00am – 5.00pm **Day 2 : 9.00am – 4.00pm**

CHEMUK2021
UK Chemical Industries Supply Chain Expo
15th & 16th September 2021, NEC, Birmingham, UK

Register NOW for your FREE entry badge PLUS to receive latest CHEMUK exhibitor & programme news at www.chemicalukexpo.com

Biosurfactant innovator Holiferm joins Sci-Tech Daresbury and launches pilot plant

Holiferm, the award-winning University of Manchester biotech spin out that specialises in developing environmentally friendly bio-surfactants for use in detergents and toiletries, has launched its new pilot plant in the Techspace One laboratory building at Sci-Tech Daresbury.

Biosurfactants are a key ingredient in the manufacture of detergents and personal care products, but current mainstream goods primarily use hydrocarbon, petrochemical and tropical oil-based surfactants, which cause significant harm to the environment.

While environmentally-friendly products in this sector do exist, they use a costly yeast-based batch fermentation process. Holiferm has developed an approach which allows this yeast-based approach to be carried out as a semi-continuous process, allowing the delivery of green products to the mass market at the correct volume and price point.

The new pilot plant, which follows a prototype plant in Manchester, will allow Holiferm to drive forward this approach. The company's long term vision is to develop a range of sustainable, green biosurfactants that will eradicate the global surfactant market's dependency on petrochemicals.

Holiferm's presence at Sci-Tech Daresbury has been supported by a £400,000 grant from the Inward Investment Facilitation Fund (I2F2) set up as part of the £75m Business Growth Package introduced by Steve Rotheram, Metro Mayor of the Liverpool City Region. Five Holiferm staff will be based at the plant, with a view to recruiting a further seven positions as a result of the new facility.

A fully commercial plant in Wirral, which would potentially create 25 further jobs, is earmarked for future development.

Richard Lock, managing director of Holiferm said: "We chose Sci-Tech Daresbury as we find the campus offering a unique one. At each stage of the process they've been extremely flexible and worked with us during the scale up stage and during seeding and expansion into fundraising. Being based within such a vibrant, supportive campus will be crucial in us achieving our aims of full commercialisation and industrial scale production, and ultimately, obliterating the use of petrochemicals in detergents and personal care products and helping to create a more sustainable world."

John Downes, chief executive officer of Langtree and chairman of Sci-Tech Daresbury, said: "Holiferm is developing a range of products which could prove vital in helping us to create a more sustainable world, and the company is an excellent new addition to our dynamic business community at Sci-Tech Daresbury and build the capabilities on the campus both in life sciences and materials, important sectors for us. I'm confident that the world class science facilities and collaborative culture on site represents the perfect environment for the company to truly flourish. The launch of the pilot plant is a really exciting milestone in their work manufacturing biosurfactants that are both cost-effective and eco-friendly, and we look forward to supporting the company's staff on this potentially game changing endeavour."

Steve Rotheram, Metro Mayor of the Liverpool City Region, said: "These are tough times for the country and our region, but we are doing everything we can to protect people's jobs and businesses, while trying to attract and create new ones. I'm really glad that we were able to attract Holiferm to the region through our Business Growth Package – and I hope they'll be the first of many. It's brilliant news to see that they have their pilot plant up and running already.

"Retaining as many businesses, jobs and investment as possible, while attracting new ones will be really important in helping our region recover from the economic effects of this pandemic, but we're already making a start!"

For more information visit: http://www.sci-techdaresbury.com/ or contact Tom Carlin, 07827 957740, carlin@thisisinfluential.com

Eleven tips for building your Chemicals team in 2021

We've been in the recruitment market for 22 years sourcing experts across speciality chemicals throughout the UK&I. As a member of CNW we're happy to share our top tips for a growing team in 2021.

What to consider when onboarding in 2021

It's been a different year for recruitment in the chemicals sector and elsewhere as clients couldn't meet those interviewing for roles and vice versa. Candidates have missed out on seeing the working environment, but this hasn't hampered the market. Here are our top tips to ensure new employees feel good about joining and stay:

1. Working remotely, we lose the ability to ask niggling questions, so it's likely new employees will take longer to integrate. Be aware of this and facilitate integration. "Team activities" or just team meetings over zoom is a good place to start.
2. Trust the abilities of your new starters – you hired them for a reason remember. Don't micromanage.
3. Listen - the new arrival may mean potential changes in team dynamic.
4. Technology must support the new starter and current team –if it doesn't, talk about it and adapt.
5. Document the onboarding and review process so responsibilities are clear.

Communication is key

You are experts at what you do, and whoever you chose to support your recruitment plans this year, you must share with the recruiter.

A good recruiter will ask you about your business; where you have struggled to hire previously, why you have lost people, how you build success, what your employer value proposition is. Then, they can accurately represent you and source the right candidates.

6. Ask the recruiter about their current clients and candidates they're working with.
7. Discuss the role and your expectations of it. They can advise on salary, candidate expectations and most importantly sometimes, how long, such processes are likely to take.
8. Ask your recruiter about unplaced candidate feedback. Many agencies sing about the recommendations from the people that they just placed in a job, of course the feedback is positive! It is how you handle everyone else that really matters.

What a candidate needs to hear

9. Candidates need to be updated regularly on the application process, timescales and expectations. Regular, honest feedback during the process is key, even if there is nothing significant to report. The candidate's experience is a reflection on the client as well as the recruiter and that experience could be the differentiator on them taking your role, over another offer in a competitive market.
10. Ask them interesting questions! Work with your recruiter to develop behavioural based questions that suit your role and company culture - you are more likely to find people that fit your business ethos this way.

What should you be looking for in a candidate?

Behaviours and attitude...you can teach the rest!

Probably not advice you would expect to hear from a technical recruitment agency. Don't ignore educational background for your next hire, but the "technical" background is the easiest thing to spot on a CV, and to question around in an interview. The most difficult thing is to be able to find out is if they will fit into your business, not disrupt your current employees, add value, stay long term etc.

11. Use behavioural based questioning, that is tailored towards you and the role. This is an ideal time to work with your recruitment partner, as we do this every day. Find out how they like to work, be managed, manage people etc.
    Within very candidate scarce markets like the chemicals industry, this methodology can highlight entry level candidates who may not "tick every box" on your job description, but feel like they were ready made for your company. With some investment in training and development, with their attitude, they'll be an asset to the company for years to come.

Add a technical interview, as well as extensive screening from your recruitment partner, and you'll have enough information to make an informed choice.

And finally good luck. 2021 has seen some big changes to the way we work and recruit in the chemicals industry. It's an exciting time to be part of it.

David Hoggart, Divisional Manager – Speciality Chemicals, Eleven Recruitment. David has eight years recruiting within the chemicals industry, covering fine/speciality/bulk/additives/lubricants manufacturers and consultancies. Spanning his career to date, he has managed recruitment campaigns at all levels within a business including technical, non-technical, commercial and senior leadership, and on a permanent and contract hire basis within the UK and internationally.

For further information please contact d.hoggart@elevenrecruitment.com

spotlight *on new members*

CDR Pumps

CDR Pumps have been a leading independent chemical pump manufacturer for not only the chemical industry, but also nuclear and pharmaceutical industries. The company have been manufacturing chemical process pumps for over sixty years and opened its doors in the UK over twenty years ago.

The North West of UK is where the Chemical industry started, and CDR Pumps proudly serve a significant number of customers in this region.

Since opening its UK doors in 1998, CDR Pumps 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 - small enough to give each of you the individual care and attention you need yet big enough to pro-actively support multi-site multi-national blue-chip chemical companies.

A holistic approach provides you with a complete, all-round service from initial enquiry throughout the entire specification and sales process, installation and most importantly after-sales service and support. Our global manufacturing facility is in Italy, strategically located to support our customers across the world. From here, our unique patented pump lining technology is applied to magnetically driven and mechanically sealed lined pumps increasing the life span of your pump and reducing the risk on wear damage or contamination.

The right choice...
As a chemical pump manufacturer, our range of fluid handling solutions has steadily expanded and includes: magnetic drive pumps, mechanical seal pumps, air operated diaphragm pumps, vertical pumps, vacuum pumps & systems, side channel pumps, turbine pumps as well as the revolutionary new electronic air operated diaphragm pump, the mobile pumping station and the first solids handling mag drive pump.

CDR Pumps UK Ltd | Making the right choice...

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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.

Our highly experienced Wholesale team supply a comprehensive range of hazardous area, Industrial and marine grade electrical equipment. Uniquely, all Dron & Dickson's internal Sales staff have completed the CompEx Foundation course, qualifying them as the most competent sales team within our industry.

The Engineering Services division of Dron & Dickson provides a full range of technical solutions, specialising in electrical equipment in hazardous areas. We have unparalleled expertise in the installation and maintenance of hazardous area electrical equipment in upstream and downstream Oil & Gas, pharmaceuticals and marine sectors.

Dron & Dickson operate in hazardous area electrical across a range of sectors including renewables, pharmaceuticals, chemicals and food & beverage. Their services operate in the UK, Europe, North Africa, Middle East, CIS and Asia.

They operate 5 branches to service clients throughout the UK:

- **Aberdeen**
- **Stirling**
- **Hull**
- **Lowestoft**
- **Runcorn**

View the full Wholesale product range here.

DRON & DICKSON

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Eleven Recruitment

Eleven Recruitment is pleased to become Chemicals North West members this year. At the start of 2021 we made additional strategic hires within the company, significantly growing the Speciality Chemicals team.

David Hoggart, alongside **John Roche** and **Danielle McConnell** join our existing chemicals team to take advantage of our existing relationships within the chemicals, lubricants and fuels markets, and capitalise on new emerging markets, such as Clean Energy, the Circular Economy and Carbon Capture.

Eleven Recruitment is a specialist, chemical recruiter with offices nestled in leafy Cheshire, with an extensive global network of industry experienced candidates and clients. Our desire and passion to seek out top, mid and senior level technical and commercial talent for clients, is as strong today as 1999 when we began.

Whether your business operates in fine chemicals, speciality chemicals, agrochemicals, lubricants or the circular economy, we believe in a true partnership approach with every client – listen then deliver.

We offer contingent or retained (headhunting) hiring packages and can source and supply both permanent and contract personnel across a range of roles including C-suite, commercial, Technical and finance. We thrive on the challenge of your 'difficult to fill' roles, it's one of our talents!

But it's not just our clients that we have an invested interest in. 84% of candidates who didn't get the job still rate us as excellent - testament to our commitment to candidate care.

Get in touch today to experience recruitment dialled up to eleven.

Contact us at:
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Handley James Chemical

Handley James Chemical focuses on mid to senior level appointments solely within the Chemical Manufacturing space. Combined, our directors have 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. The business focuses on providing the best talent in the chemical industry. We work closely with you, our client, to understand your business, your culture and exactly what you are looking for from a recruitment partner. This allows us to provide a tailored solution and ultimately results in finding the best talent for your brand.

Having an in-depth knowledge of the Chemical sector is imperative to providing a bespoke, quality search service to you, the client. Stuart, has established a strong reputation in this marketplace and has an excellent understanding of the industry, as do the consultants, within the business.

Covering the UK and International landscape we provide true search methodology across a multitude of disciplines from mid to executive level, these include:

- ***Engineering***
- ***Operations***
- ***Sales & Marketing***
- ***Technical & NPD***
- ***Procurement & Supply Chain***
- ***Director Level & International***

We believe that most recruitment consultancies drive a KPI culture that is not quality but volume and financially driven; here at Handley James Chemical we consider quality and care as the most vital elements of the service we provide and this applies to both clients and candidates. Our business has been built on strong working relationships with candidates and clients alike.

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Linkedin: https://www.linkedin.com/company/handley-james-consulting-ltd/
Twitter: https://twitter.com/HJCRecruitment

spotlight *on new members*

Itac

Since 1902 Itac have specialised in developing high performance solvent-based adhesives and coatings that have enabled our customers to develop market leading products critical to countless end use applications. Mixing great chemistry, innovation, ingenuity, and close collaboration with our partners, Itac provide skills and expertise throughout the formulation, sampling, trialling, upscaling, and qualification processes. This enables our customers to demonstrate continuous innovation in the development of new products, or the improvement of existing ones.

Central to Itac's offering are the polymer coating effects we provide to add value to new or existing products. Whether it be maximising fire protection, promoting long term performance, meeting air tightness and waterproofing requirements, or preventing cohesive, adhesive, or substrate failure; Itac can help to impart the desired effect. We recognise that one adhesive or coating does not do everything for everyone and work closely with our clients to understand the environments their products are expected to perform in. We then align the chemistry with the right application to make things happen!

Itac also provide confidential toll and contract manufacturing services. With proven competence in polymer compounding for various applications, these enable our partners to focus on their business objectives, simplify processes, make cost savings, and ensure continuity of supply for their own clients. Whilst reducing the hassle associated with the dissolution process required for specialist coating materials, Itac's clients can also put their trust and confidence in Itac's lean Kanban operation to receive material when they need it and reduce their need to hold stock and tie up working capital. We cater for a wide range of viscosities and process equipment is frequently calibrated to enable accurate and repeatable batches to be made.

Itac support you in what you do best!

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Science Solutions Recruitment

"How many of you as hiring managers feel existential dread at the thought of having to use a recruitment agency to secure candidates for your next hire? For those that have found an agency that doesn't make you think "could I just take on the extra work myself and save the hassle", how long did it take you find that effective recruitment supplier?

This unfortunately is the situation faced by many of our clients and why we strive to be who we are. We define ourselves as a scientific and technical recruitment consultancy who operate across the breadth of the chemicals industry, with the aspiration of being a truly trusted expert supplier to our clients. We also define ourselves as what we aren't. We aren't generalist recruiters. We won't take on roles within your business outside of scientific related positions, and we certainly won't blindly promise to fill your vacancies without fully understanding your requirements.

What we can do is use our expertise within the scientific recruitment market to give you an honest understanding of the talent that is available and how best to attract them to your positions. We'll be accountable to you, we have a proven process, and we'll provide you with a tailored service.

Our understanding of the chemicals market is based on our team being solely focused on working with the best talent for our clients' needs, building strong long-term commercial relationships, and both listening and advising on how to address their needs."

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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.

BakerCorp UK Ltd
Provision of rental products for transfer, storage and treatment of liquids. Specialising in liquid management solutions for demanding operations, with focus on the tank, pump and filtration product lines. From a single-product storage project to setting up an integrated multi-product solution. Initial chemical compatibility checks, 'job walks', CAD drawings and rigorous equipment maintenance schedules.

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.

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.

Manchester Metropolitan University
Degree apprenticeships, consultation services, collaborative and contract research facilities, and students seeking placement opportunities. The Department of Natural Sciences trains undergraduate and postgraduate students in chemistry, pharmaceutical chemistry, medicinal and biological chemistry, biology and environmental science. New MSc in Advanced Materials starting in September 2020 https://www2.mmu.ac.uk/natural-sciences.

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.

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.

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 Northern (UK)
Special mechanical fitting system that produces a permanent weld equivalent pipe connection, eliminating the need for hot work, NDT and associated health and safety issues. Lokring fittings are code qualified to ASME B31.1, B31.3 and other industry standards. A proven cost saver compared to traditional welding and fabrication methods.

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.

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.

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.

Intersolia
Intersolia provides large organisations and small firms with a web-based platform designed to enable them to achieve COSHH compliance, and most importantly providing those who use chemicals as part of their everyday workplace activities with the critical safety information needed to safeguard their health and in doing so, protecting the business.

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.

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.

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

Smithers Viscient
Environment at testing and regulatory services, carrying out environmental, consumer safety contract research and regulatory services. Plant metabolism, aquatic ecotoxicology, avian toxicology, environmental fate, honeybee and pollinator testing, endochrine disruptor testing, residue, analytical and product chemistry.

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

HYDROGEN – ValveTechnologies' Absolute Zero-Leakage Valves

ValvTechnologies has developed advanced innovations to achieve zero leakage in quarter turn, metal seated, isolation valves. Hydrogen molecules are so small that they can permeate through base metal substrates and coatings. The picture below shows the comparative size of Hydrogen (in blue) being around one-quarter the size of Oxygen (in red) versus a water molecule (shown as 2 blue atoms plus 1 red atom). The addition of a third process to sealing components is critical in exceeding the most stringent ANSI standard, such as Class VI, for Hydrogen service.

Application Challenges

Hydrogen gas escape is closely linked to the hazards of fires and explosions. Gaseous Hydrogen, when mixed with Oxygen (a component of air), has the potential for self-ignition, is highly flammable, and can create flash fires. There are several hydrocarbon processes that involve either pure or partial Hydrogen, which should be considered during valve specifications. Liquid Hydrogen is relatively safe as compared with the gaseous state.

Differentiating Features

A third process is applied to balls and seats, in addition to ValvTechnologies' RiTech® Chromium Carbide (80% Cr3C2 20% NiCr) or Tungsten Carbide (86% WC 10% Co4Cr) coatings. This third process is unique in its ability to fill and seal inherent micro cracking and porosity found in base metals. It is applied by saturating the component area with a chemical solution at room temperature. The process uses chemical reactions and change of temperature, creating chemical bonds to both the RiTech coating and substrate. This firing also drives a reaction whereby the third process chemically bonds to both the coating and the substrate. The chemicals are drawn into all existing open pores and micro cracks. The firing converts and bonds these chemicals to the walls of the voids and fills the pores and micro cracks. Repeated cycling as sures that all these pores are filled or sealed off. The resulting coating cannot be penetrated by corrosives or Hydrogen, as there are no open pores to allow infiltration.

Tungsten or Chromium Carbide coatings in conjunction with a third process is the optimum solution for impure Hydrogen, or pure Hydrogen for pressures under 3,500 psi. For pressures exceeding 3,500 psi, a ValvTechnologies' proprietary spray and fuse process is the recommended solution.

VALVTECHNOLOGIES®

ValvTechnologies has achieved ISO 15848-1 certification for fugitive emissions

Another unique, key element is ValvTechnologies' integral seats which means that the valve endcap and seat are one, contiguous component. The avoidance of having a separate, loose seat eliminates the possibility of gas escape behind that separate seat and the seat pocket. The force applied by a Belleville spring pushes the upstream seat into the ball and in turn, into the integral seat becoming a crucial design consideration. ValvTechnologies' spring loads are several times higher than competitors. The highest possible forces ensure that Hydrogen cannot "leak by" the seat and the ball. In doing so, the overall valve does have slightly higher operating torques.

Testing

To assure zero leakage, every valve is 100% factory tested using Helium. Both Hydrogen and Helium are of similar molecular size, around one quarter the size of water H2O molecules. Helium is an inert gas, the second least reactive of all elements in the Periodic Table, diffuses 3 times faster through solids than air, and ultimately is much safer to use during testing. ValvTechnologies has achieved ISO 15848-1 certification for fugitive emissions:

ValvTechnologies manufactures ANSI/ASME pressure classes 300, 600, 900, 1500, 2500 and 4500 with cycle times of .2 to 1 second. For sizes above 8" cycle times will be as agreed with customers. ValvTechnologies also offers API 5000 through 30,000 6A and 6D designs.

EMISSIONS CERTIFICATIONS
ISO 15848 . API 641 . TA LUFT

To discuss the range of ValvTechnologies zero-leakage isolation valves, or to find out about our valve maintenance capabilities, call MCE Group Plc on 01925 202399.

MCE GROUP plc

Valve Maintenance & Valve Supply.

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**