

A unique industry, with unique companies and unique news

elements

In this issue:

Chemicals in electric vehicle batteries

UK clusters and the importance of 'place'

BowTie analysis software

Improving your exporting performance

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- paints and adhesives
- healthcare and medical
- personal care
- pulp and paper
- textiles
- water treatment



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Membership

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

If you are a manufacturer, chemical user or offer products and services to the sector, why not join us today? See over for details or please contact:

Alex Abraitis - Member services and events manager
alex.abraitis@chemicalsnorthwest.org.uk or visit:

www.chemicalsnorthwest.org.uk/membership/membership_benefits/

2018-2019 Rates

| | | |
|-------------------------------|--------------------|----------|
| Micro corporate membership | (1 - 10 employees) | £423+VAT |
| Standard corporate membership | (11-100 employees) | £735+VAT |
| Large corporate membership | (100+ employees) | £936+VAT |

Welcome

Hello everyone and welcome to the summer edition of elements. We will focus on the review of the Chemistry Growth partnership and the role that will be played by ourselves at CNW and our colleagues at the other UK chemical networks in terms of better understanding the strengths provided by regional clusters.

Since the last issue we have been supported by two CNW members in staging themed workshops; Department for International Trade on funding support available to local companies and RPS Risk on "BowTie" analysis tools in process safety management. Process safety is also the subject of CNW's next event in the autumn, so please look out for further announcements.

This is the second issue of elements containing the CNW directory. We hope you like the new format and with this and any other aspects of our offering, we welcome feedback and suggestions.

John Roche - *Chemicals Northwest*

About us...

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

With over 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, Chemical Northwest has reached new levels of topicality and quality. Here are 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.

"Focus 50" - This recently named series of seminars and networking events is becoming ever more popular.

Over the years CNW has focused on a range of highly topical and relevant business issues. Technical, regulatory and operational insights have been delivered by experts in their fields. These events ensure good practices are shared and all 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, 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 was created in the latter half of 2010 and has an ever increasing membership, with over 1300 members now connected. The group provides the opportunity for chemical industry professionals to share ideas and knowledge.

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.



Chemistry Growth Partnership (CGP)

– supply chains working group



Chemicals Northwest hosted the latest meeting of this group on 7 June 2018 at Sci-Tech Daresbury. Chaired by BASF managing director UK & Ireland, Richard Carter, the group was updated on the wider CGP review currently underway as well as taking a closer look at specific markets for chemicals.

The UK produces 5 mtpa of plastic waste of which two thirds were used for packaging. This waste represents a potentially valuable raw material for the chemical industry and there are significant financial savings to local authorities if it can be used. In addition there is potential

for £5bn GVA addition to the economy. Innovate UK reports that in principle the technology exists to convert plastic waste back to chemical feedstocks (syngas or condensate/gas). However practical processes will need to consider if syngas or condensate/gas can be produced of an appropriate quality and consistency? Importantly would the economics be viable and are there interested investors in the UK?

Chemicals are widely used in the construction sector from coatings and adhesives to building panels and insulation. The future developments in this sector were reviewed and again mapping is underway to better understand the role that chemistry plays in its vital supply chains.

...and the importance of ‘place’

As reported in the last edition of Elements, the CGP review created a new focus on the chemical manufacturing activity based in several key UK regions. As the Government's Industrial Strategy made reference to “strength of place” policy, the UK chemical ‘clusters’ and their associated chemical parks present a potential investor with locations which de-risk projects and reduce capital costs.

This is a key selling point for chemicals investments whether to strengthen existing supply chains or to build new ones for future growth. Larger volume products with high energy requirements and logistics demand (petrochemicals, chlor-alkali products and bulk polymers) are usually located in one of the four major chemicals clusters: Grangemouth, Humber estuary, Teesside and the Northwest. By contrast speciality chemicals manufacture, where material flows and energy requirements are lower, tend to be more dispersed throughout the UK.

The CGP firmly believes that in general, new investments are better to locate in one of the four main UK clusters for many reasons. There is their proximity of logistics services (sea and road) and the ease of importing raw materials and exporting products. Co-location with a feedstock manufacturer and possible customers is also likely to be an advantage.

The clusters possess key strengths such as the availability of: key building block ethylene, a specialised “chemistry knowledgeable” workforce and support services (engineering fabrication, maintenance). These are strengths that will play an important role in helping reduce start up times, reduce running costs and deliver improved safety.

Within the CGP, industry and government departments continue to work closely in identifying further the strengths of the UK chemical industry and the growth opportunities that will help deliver the overall aims.



Northwest success at CIA awards

Chemical Industries Association held its annual awards ceremony in Gateshead on 14 June 2018, and the winners included several CNW members: Stepan UK Ltd Stalybridge for Process Safety Leadership; GlaxoSmithKline, Ulverston for Skills; The University of Manchester's Science & Engineering Education Research and Innovation Hub, Manchester for Reputation; Contract Chemicals Ltd, Prescot for Innovation and Jennifer Peake of William Blythe became Young Ambassador of the Year. LyondellBasell, Carrington won the Health Leadership Award.

UK electric vehicle battery industry could be worth £2.7 billion per year for UK chemical companies

A new report commissioned by WMG at the University of Warwick, was launched to the Chemical Industry Association at the Chemistry Growth Partnership meeting in London, chaired by Steve Foots, Chief Executive of Croda, and attended by Richard Harrington MP.

The research underpinning the report brought together experts and data from the automotive battery industry and chemicals industry, working in the context of the UK's Industrial Strategy, points to a large UK battery manufacturing industry opportunity. The report was funded by EPSRC, commissioned and managed by WMG acting in their role as the Advanced Propulsion Centre Electrical Energy Storage Spoke, and delivered in partnership with E4tech. WMG's Professor David Greenwood, one of the report's authors said: "The UK's Industrial Strategy identified battery development and manufacture as one of the four initial Grand Challenges to coalesce industrial activity upon high growth opportunities. Battery pack manufacturing for electric vehicles (EVs) will logically take place close to the point of vehicle assembly since packs are hard to transport. This in turn implies that the battery cells which make up the packs will best be manufactured in (or close to) the UK".

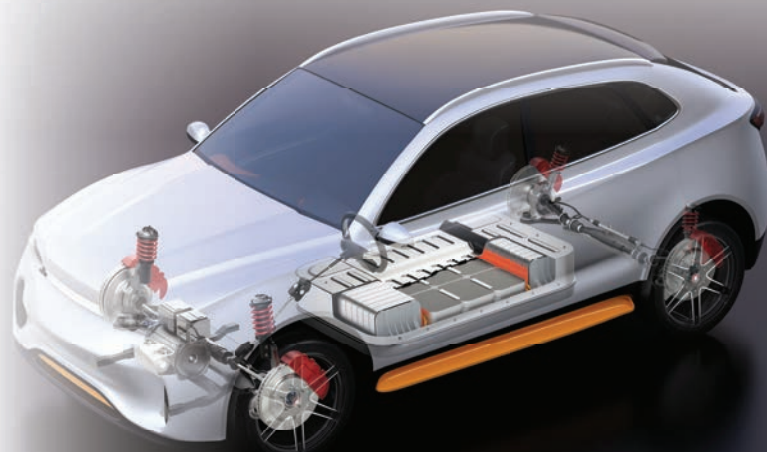
The report notes that the UK manufactured 1.7m cars in 2016, around 80% of which were exported (SMMT 2017). Assuming that 50% of the vehicles manufactured in 2030 are electrified vehicles (EVs and PHEVs), and taking into account the expected falls in battery cost, the corresponding value of cell materials per car will be £3,200, worth £2.7bn per year to the UK chemical industry just for UK-built cars, with export potential to Europe of ten times that.

Examples of required chemicals include: cathode and anode active material (total 117 ktpa), electrolyte (27 ktpa) and electrode binders, solvents and additives (total 10 ktpa).

The report makes a range of observations and recommendations that would be key to ensuring that the UK can capitalise on this significant opportunity.

- The battery chemicals supply chain is a highly additional opportunity for the UK chemicals sector. Seizing it will require the automotive battery and chemicals industries to work very closely.

- UK battery manufacturers find that sourcing process equipment from outside the UK is not a problem but sourcing materials, especially those used for conventional lithium ion batteries, poses supply security issues. UK battery technology developers are currently sourcing their materials from outside the UK and are not facing particular challenges from a supply chain point of view, given the small scales and novel materials
- Conducting joint R&D with technology developers could be a way into the battery supply chain for UK chemical companies, provided they can supply battery-grade materials at scale
- Under current conditions, companies are looking at strategies to enter the battery supply chain that minimise risk, such as adapting existing products, developing new products that can have multiple applications, or conducting R&D activities co-funded by public grants
- Only a few UK companies are already supplying the battery industry at scale. Those who are not will need time, once the business case is made, to develop new products and the necessary production capacity as the typical time to market for new products in the chemical industry is in the order of 2 years
- Many indicated building close partnerships with developers of new battery technology as their preferred strategy, allowing them time to grow and gain competitive advantage over suppliers to current battery technology manufacturers
- Certainty in the UK battery market is essential to enable investment in chemical production plants
- Supporting the growth of our smaller / SMEs companies could ensure resilience within the UK economy. Funding is required to engage with these industries to help them de-risk and make the transition into this new sector.





Process, Hazards, Investigated



TESTING

Our fully equipped laboratory can perform a full range of process safety testing including; chemical reaction hazards, dust explosion testing, regulatory testing and aerosol safety testing

CONSULTANCY

Based on decades of science and experience our experts can offer specialist consultancy and advice to assist with your process.

TRAINING

Tailored training courses designed to increase your staff's skill levels and breach any knowledge gaps.

www.Kindlow.co.uk

Process safety is a vital part of any operation but the knowledge and expertise to achieve it may not always be available in house. At Kindlow Safety Services your process safety is our number one priority. We understand that it is necessary to control hazards and potential hazards such as dust explosions, thermal decomposition and runaway chemical reactions in order to achieve safe operating conditions. Our dedicated team have decades of experience originating from industry and can provide expert knowledge and advice to support you in achieving your safe working parameters; whilst our fully equipped laboratory can provide the test data required to meet legislation.



Understanding the dangers of dust

...and having the right test data for you

Handling of dusts and powders is an inevitable part of many industrial processes in the chemical, foodstuffs, woodworking, sewage and coal sectors to state a few.

Any dust which is flammable will form an explosion hazard if dispersed in air. Many day to day dusts can be explosive such as pigments, dyes, foodstuffs and plastics. However, not all dusts are explosive. The only certain way of knowing if a dust is explosive is with laboratory testing. A specialised laboratory can perform a simple Go/No go test. If the result is positive, further testing is highly recommended in order to determine the full explosion risk of the dust.

To create a dust explosion the familiar elements of the Triangle of Fire must be present; fuel, air, and an ignition source plus two additional components: Dispersion - to mix the dust with air, and Confinement – an enclosed space. The result in the open is not an explosion but a flash fire which is still considered very dangerous and should not be overlooked.

The consequences of a dust explosion can be devastating to an entire plant. Historically a disaster scenario would be created from dusts being carelessly handled; allowing fugitive dust to build up on floors, ceiling voids and horizontal surfaces. Ultimately there will be a local dispersion of the dust which is ignited possibly by static discharge, an open flame or hot surface. This small flash fire will disperse the remaining dust on the horizontal floors and surfaces resulting in catastrophic dust explosion. Dust explosions can be sizeable and pressures of over 8 barg are not uncommon. An explosion of this magnitude can lead to a building collapse, loss of life and a contamination breach into the environment. As such it is integral that good house-keeping is a critical part of an any explosion prevention system.

Where the elimination of an explosive environment is not achievable / appropriate, protection from the effects of a dust explosion is technically possible by several different methods:-

Confinement

Equipment is made to withstand the over pressure of a dust explosion. However, this is expensive and heavy; typically needing to resist pressures of 12 barg.

Inerting

Equipment is 'blanketed' with nitrogen (or another inert gas) so that an ignition is not possible (absence of air). However, this has its own hazard of accidental asphyxiation.

Suppression

With this method an incipient explosion is detected and a fire extinguishing agent is injected into the confined space in order to suppress the explosion almost completely. It should be noted though, that some residual pressure will remain in some systems.

Venting

This method allows the explosion to exit to a safe area via explosion relief panels, preventing the destruction of the plant.

In general venting and suppression are the most used methods in industry and inerting is used where high value and or high toxicity products are involved. Whichever protection method is chosen several essential dust parameters must be determined in a laboratory in order to ensure the level of protection will be sufficient and appropriate for the process in question.

These are typically:

Kst value - The rate at which the pressure will rise at the optimum concentration.

St value - The explosion category (0 to3) to which the Kst value belongs.

Pmax - The maximum explosion pressure measured over the test range of concentrations.

Minimum Ignition Energy (MIE) - How susceptible to static ignition the dust is.

Minimum Auto Ignition Temperature (MAIT) of a dust cloud - The temperature at which the dust ignites.

Our highly trained experts have decades of industry experience and are able to offer advise and guidance to help you find the right solution for your process. Whilst our specialised laboratory can perform the testing required to obtain the safety data needed; including dust explosion testing and vent sizing.



The Trump Administration and global chemical issues

This article reviews the Trump Administration's engagement, to date, in key industrial chemical matters, domestically and internationally.

TSCA

Implementation of TSCA's legislative do-over in 2016 has been the focus of considerable EPA attention. A few observations can be made at this early stage. First, TSCA's core approach to chemicals management is unchanged. Chemicals remain subject to regulation based on the identification of "unreasonable risk," and not identified chemical hazards, the driver of the precautionary principle that fuels the REACH regulation. Second, changes to TSCA's Section 5 new chemicals program have diminished the commercialization of new chemicals without restrictions, and slowed chemical innovation. Third, animal testing alternatives are now preferred, and new testing will flourish and potentially replace slower and less humane testing strategies.

The International Scene: chemical initiatives

What, if anything, can be discerned at this early stage regarding the Administration's engagement in global chemical management initiatives? A few points warrant mention here.

SAICM: Industrial chemical initiatives are grounded principally in two programs managed under the auspices of the UN: the UN Environment Program "Strategic Approach to International Chemicals Management" (SAICM) and the UN 2030 Agenda. SAICM is voluntary, stakeholder-based, and includes 175 governments including the U.S., 85 NGOs, and representatives from industry and civil society. SAICM was adopted by the International Conference on Chemicals Management in 2006, the mandate for which expires in 2020. Key objectives include: risk reduction, knowledge and information, governance, capacity-building and technical cooperation, and illegal international traffic.

Given the fast approaching 2020 expiration date, whether SAICM should continue is the subject of debate. SAICM has been considered a success by many, as measured in terms of providing a venue where stakeholders are able to meet, collaborate, and benefit from its voluntary, stakeholder-based structure. Others point to the fact that the 2020 goals have not been achieved, suggesting that a legally enforceable framework is needed. U.S. industry would likely not favor a legally binding construct that resembles REACH, an option being considered and discussed. The Trump Administration, reflecting the U.S. chemical industry's wishes, can be expected to support extending SAICM in its current form and continuing U.S. participation in it. A U.S. presence would be viewed as prudent and potentially necessary in challenging proposals that might be advanced by advocates of a more REACH-like chemicals management approach.



2030 Agenda for Sustainable Development: Under the U.N. 2030 Agenda, 17 Sustainable Development Goals (SDG) have been designed to "free the human race from the tyranny of poverty and want and to heal and secure our planet." The goals are:

The Business and Sustainable Development Commission (BSDC), launched in Davos, Switzerland in January 2016, seeks to map the economic benefits that could be available to the global business community if the SDGs are achieved. The BSDC is part of the World Business Council for Sustainable Development (WBCSD), a CEO-led global advocacy association consisting of over 200 organizations that address business and sustainable development. The BSDC's 37 members include leaders from business, finance, civil society, labor, and international organizations.

While EPA's direct participation is unclear, U.S. chemical stakeholders recognize that much of the work necessary to achieve the ambitious goal of achieving the SDGs falls on the private industrial sector. The WBCSD is preparing a report on this topic, tentatively titled Chemical Industry Contributions to the UN SDGs, expected out in draft soon. The contents of this report will provide a clearer line of sight on how industry intends to achieve the SDGs.

Ratification of the Stockholm Convention: A stated priority of the U.S. chemical industry in 2017 was ratification of the Stockholm Convention on Persistent Organic Pollutants. While most of the original chemicals under the convention included pesticides, more recently the Persistent Organic Pollutants Review Committee has focused on industrial chemicals. Industry stakeholders have expressed concern that without U.S. ratification, European and Nordic country influence on chemical selection could adversely impact the global chemicals market and promote hazard-based regulatory approaches. There has been no recent legislative effort in the U.S. to ratify the convention. When and how U.S. legislation might advance to assure ratification, especially in an election year, is unclear.

Author: Lynn L. Bergeson
President, ACTA Group

Five reasons manufacturers shouldn't be pessimistic about the UK's productivity outlook

With new research showing most economists expect productivity growth to remain sluggish this year, chairman of process engineering firm BPE Ian Shott tells us why we could be positive about our future prospects and how manufacturing technology could turn our fortunes.

UK workers are no more productive now than they were on the eve of the financial crisis and productivity only grew by 0.3 per cent over the first nine months of 2017. Economists are not expecting there to be any pick-up this year.

So why the pessimistic view? Of course, Brexit plays a big part. Uncertainty about the UK's future outside the EU is expected to weigh on investment spending and we know the fear of increased red tape from new import and export rules – which are yet to be decided – is unsettling some manufacturers.

Other contributing factors include the fact that manufacturing now makes up a smaller percentage of industry while our service sector is growing. It means there are a lot of people in employment but generally on lower wages, pulling productivity levels down. However, BPE believes there are five good reasons to be cheerful:

Reason #1 – Common sense will prevail when it comes to Brexit tariff rules

There are fears that new import and export rules could cripple manufacturing firms. We've been so used to a frictionless movement of products across borders that the thought of having to battle our way through red tape is unsettling.

That said, I don't think we should be suffering sleepless nights as a result. As a CEO I'm optimistic and others should be too. In the private sector our natural instinct is to accept the situation and work out how to manage it. That's what we'll do collectively.

Whether it's a soft or hard Brexit doesn't matter. What matters is both sides do a deal that's sensible and I remain confident that common sense will prevail. Brexit will consume more airtime than it should but I also believe that businesses will focus on the opportunities that present themselves from whatever is the outcome and change always generates opportunity often unexpected.

Reason #2 – Brexit could be a solution, not a problem

For decades we've been reliant on Europe for imports of certain goods. With Brexit on the horizon, ministers are looking at how we can make a change and start to replace that with local manufacturing on UK soil. From the conversations I've been having with ministers it's clear they see Brexit as a golden opportunity to stimulate what we do here in the UK and they're highly motivated to support a reindustrialisation of the country supported by the Industrial

Strategy, increased Government funding for Science and Innovation and a number of fiscal levers such as R&D tax credits, lower SME corporation tax and Entrepreneurs relief.

Reason #3 – We have money and a plan

For the first time in decades, we have a clear industrial strategy that's underpinned by real investment. Westminster is injecting £4.7bn into innovation and research this term and promising to add £2bn more per year thereafter.

Arcinova, a Contract Research and Development Organisation of which I am managing director, has just won a grant of more than £1m to develop small scale modular continuous processing for drug manufacturing. We're expecting there to be more where this came from. An Industry 4.0 fund is definitely in the pipeline and we're predicting an industrial challenge fund for bio technology soon, which BPE could take advantage of in helping its clients to develop new processes.

Reason #4 – We are a nation of innovators

The UK has a strong heritage for innovation; we sparked the industrial revolution and can claim host to some of the world's greatest scientists and inventors.

Now, our manufacturing industry is using technology to improve efficiency across the board and I have no doubt that Industry 4.0 will play a significant role in boosting productivity over the next 12 months.

At BPE we're working with some big-name companies to design new plants and facilities and they're really embracing automation and a move towards a 'smart factory'. We're also using computer aided systems to design more productive plants for our customers and make our own operations more efficient too.

Reason #5 – We've only just scratched the surface of what continuous processing can achieve

The pharmaceutical sector is already coming on-board, spurred on by a need to maintain profitability amidst the government's increasing regulatory and pricing pressures on the industry. The patent cliff of the last decade was the danger warning pharmaceutical manufacturers needed to reassess their processes and look at how they could make them more efficient. Now they're doing that by switching their small-scale production from batch to continuous.



At BPE we've seen a marked increase in continuous processing projects in the last few years and this will continue to drive opportunity going forward. We aim to help our clients boost their productivity.

Ian Shott, chairman of BPE

Quality-assured training from IChemE

IChemE is a market-leader in training for chemical and process engineers. Every year, we stage over 100 courses around the world covering everything from process safety to project management, HAZOP to human factors and distillation to dust explosions.

Safety

Asset Integrity Management in the Process Industries

Comprehensive Explosion Science

Consequence Modelling Techniques

Explosion Risk Management

NEW

Fundamentals of Process Safety

Hazard Identification Techniques

HAZOP Leadership and Management

HAZOP Study for Team Leaders and Team Members

Human Factors in Health and Safety

Inherent Safety in Design and Operation Development

Layer of Protection Analysis (LOPA)

Managing the Hazards of Flare Systems

Process Risk Assessment

Process Safety Awareness

Process Safety Leadership and Culture

Process Safety Performance Indicators and PSM Auditing

Safety Instrumented Functions (SIF)

NEW

Personal Development and Leadership

Creativity for Chemical Engineers

Effective Communication for Engineers

Effective Technical Writing

Managing Cross Cultural and Virtual Teams

Mentoring for Chemical Engineers

New to Management

Process Operations

Chemical Engineering for Other Engineers

Chemical Engineering for Scientists

Practical Distillation Technology

Commercial and Project Management

Engineering Project Management

IChemE Forms of Contract

What Engineers Need to Know About Contracts

Sustainability

Leading an ESOS Assessment

NEW

Online

Emergency Planning Principles

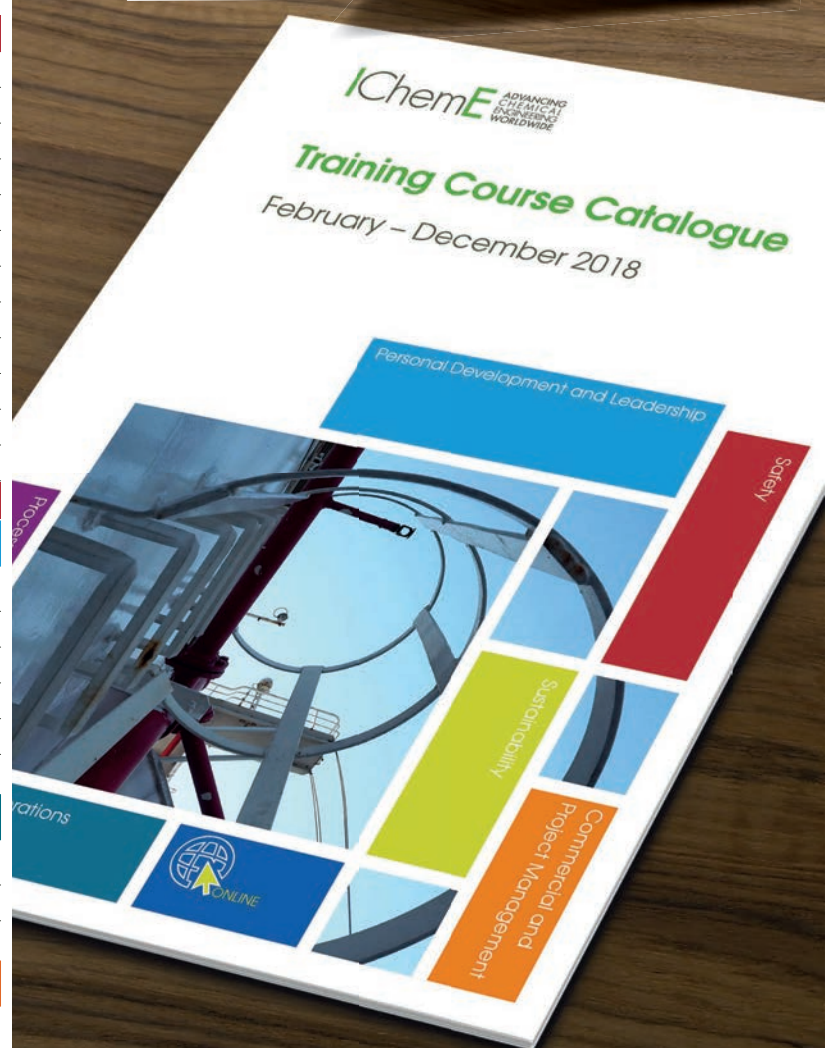
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ReAgent's sunnier side of the street!

In the last edition of Elements, we celebrated 40 years of ReAgent Chemical Services Ltd, a family-owned chemical manufacturer located in Preston Brook, Cheshire. It has been a story of growth, and now, having outgrown their original factory, ReAgent has relocated its plant across Aston Fields Road on the Whitehouse Industrial Estate.

ReAgent provides a range of chemical processing services including blending, mixing and formulating. It employs over 40 people, has a turnover of £8.3m and its product range includes over 400 products. Last year, the board announced a major £2.4m investment in relocating to a larger and purpose-built factory.

The project was delivered on time with many operational improvements. Management is pleased with the benefits the new working conditions have created across all functions and work spaces. Managing Director Richard Hudson says: "Pick a department and you can see the improvements. We have new capacity to expand."

Physically, the move represents a huge increase in size from 15000 ft² to 37500 ft² which means more space for equipment and processes. The new laboratory space is five times greater than before.

Noticeable productivity improvements are already being experienced as better inventory management and materials flow through the factory. This results in accurate stock control and less waste. Much thought and design has gone into the work-flow dynamics. It all follows the receipt and transit of raw materials from the formulation process all the way through to the final product and eventual despatch.

Thinking about the process has encouraged management to consider LEAN and Six Sigma approaches that will further improve operations. Extra production capacity means they can better serve existing and new customers by having the ability to fulfil larger orders.

Building design has also created more efficient and functional laboratory, office and staff spaces. In the laboratory, the purpose-built features have enabled a logical flow of work. These include wide benches, reagent and sample storage shelving, new analytical equipment and a highly effective fume extraction system.

The company is also becoming more sustainable as a result of the move. Besides the economic benefits

already mentioned, environmental aspects have also been addressed. We see enhancements to safety and security and there is extra space for segregation, storage and access to chemicals, both internally and externally. A workplace risk assessment ensures people are protected from fork lift truck traffic. Lorry loading and unloading is now safer with an improved and larger access yard that has ample room for turning circle. Delivery drivers can now wait and rest in a new reception area. Security measures have also been stepped-up. Stronger double fencing has been constructed for external chemical storage with new security and fire alarms, plus a 24/7 camera system.

Re-engineering the supply lines to the production areas has optimised the efficiency and usage of process water. Drainage from the new yard area has been re-routed and modern spillage containment facilities have been installed. The factory is fitted with energy efficient LED lighting throughout and further energy savings are being made through efficient gas space heaters.



Richard Hudson

Quality improvements have been achieved by adapting good manufacturing standards. One new market for the company, Medical Products and Devices, involves achieving the ISO 13485 standard. Full accreditation would not have been possible with limited space in the old building, and this accreditation is expected to be achieved within the next year.

The majority of company sales are to the UK, but ReAgent are now seeing sales to China growing even faster than in

Europe. The drive is to grow UK sales further over the next three years (an increase of around 20% is expected over the coming two years) and then to concentrate on developing business in the US market. Growth by acquisition is not ruled out either.

Darren Wilson, Sales and Marketing Director, explains: "The new factory impresses new customers and we have picked up some big clients along the way. But leading up to the move there have been instances of turning new enquiries away. That has now changed, however, and the company has big plans for the future."

This really has been a positive step forward for the business and the future is very exciting. Richard concludes by saying: "We've now got the space to grow. I feel like we are starting over again."

www.reagent.co.uk
www.chemicals.co.uk

Additive manufacturing and related combustible dust hazards in 3D printing

Over the last few years we have witnessed the expansion of additive manufacturing using 3D printers from utilization as a prototyping tool to increasing implementation on the plant floor. The rapid evolution of this technology and its applications has created new challenges for process safety. These challenges involve understanding powder combustibility properties and how best to implement reliable inverting measures to prevent fires and explosions during powder processing and handling.

If you are involved in purchasing a 3D printer or a building official charged with reviewing and approving its use in your community, you need to be aware of certain hazards and what to do about them.

Risks in the process of additive manufacturing

Materials used in additive manufacturing cover a very wide range, from plastics such as nylon, ABS, high density polyethylene, polyethylene terephthalate and others, to metals such as stainless steel, titanium, aluminum and their alloys or even gold or silver. Most of these materials are combustible and, therefore, explosive as dusts. The 3D printing process itself generates dust; in fact, it can produce very small particles (even in the nanoparticle range). Some metals such as titanium and aluminum can burn very fast and produce extremely high temperatures and pressures, necessitating extra caution. Some metals, like titanium, require a special mention for their high explosion index.

The degree of hazard linked to dust is heavily dependent on the amount of material in question, and its behavior in that quantity. A dust explosion is caused by the rapid combustion of particles suspended in air in an enclosed space. When these particles come into contact with a spark, an open fire, an overheated surface or electrical discharge from machinery, an explosion can occur.



Figure 1. Fire triangle and explosion pentagon. Users of additive manufacturing are often working with fuel and oxygen, so ignition sources need to be avoided to prevent fires or explosions.

The image left, used by OSHA and other agencies to communicate the risks of powder handling, illustrates how fire and explosion result from a combination of conditions. As shown, when handling combustible dust or powder in ambient atmospheres, all that is needed is a suitable ignition source to initiate a fire. If this occurs in the presence of a dust cloud with many particles dispersed in a contained area, it could lead to a larger, more damaging explosion in a matter of milliseconds. Preventing metal dust clouds from forming is therefore of paramount importance.

What to do about these risks?

Management of the hazards posed by combustible dusts has been regulated in the last decades. For instance, the so-called ATEX Directives and ISO standards (mainly ISO 60079) apply in the European Union and some other countries. In the United States, National Fire Protection Association standards (mainly NFPA 652, 654 and specifically for metallic dusts, NFPA 484) aim to reduce combustible dust hazards.

These standards and regulations require measures be taken to capture and contain fugitive dust generated during machining activities. The standards outline prescriptive requirements for these dust collection systems that govern the design and construction of the containment equipment, or call for explosion venting or explosion suppression systems. In lieu of prescriptive requirements, performance-based approaches can also be considered in order to manage these hazards. These approaches typically may be scrutinized by Authorities Having Jurisdiction (AHJ's)

While there are standards for metal dusts in general, specific questions may arise when it comes to additive manufacturing, such as requiring the electrical equipment inside the printers to be classified for use in hazardous areas, explosion or deflagration venting, and limitations on the handling and storage of materials, all of which can significantly influence the cost of installing a 3D metal printer.

We suggest you formulate your combustible dust fire and explosion management program to include the following steps before you implement a 3D printing process on your premises:

Developing a dust sampling and testing program - to identify and test materials present in the process to determine the explosibility and ignitability characteristics necessary to complete the analysis.

Dust Hazard Analysis (DHA) – to identify potential unsafe operating conditions and potential risks in the design and to provide recommendations for appropriate process safety measures, including engineering controls, equipment and procedures.

Development of written safety procedures - to detail the procedures and operational guidelines necessary for the safe operation of the facility.

Fundamentals of combustible dust training program –to train your personnel on-site.

Effective risk management requires an understanding of the specific hazards associated with these powders/dusts and of the risks that may be present at your particular facility based on its likelihood and severity parameters. Common testing that can be used when preparing for 3D printing process include combustible dust explosibility and ignitibility properties, electrostatics, and thermal stability. Ensure that anyone you choose to work with can assist you in developing strategies to ensure safety, including housekeeping, dust control and separation and segregation.


*Authors: Arturo Trujillo and Steve Luzik,
DEKRA Process Safety*

DEKRA has announced it is opening a chemical reaction hazard laboratory in the demonstration area of the national public inspection and testing service platform-Jinan District, Shanghai. This latest state-of-the-art laboratory adds to DEKRA's strong global presence with process safety related testing facilities on three continents.

At the opening ceremony on 22 May 2018 at the Shibei HI-TECH Park Business Club, DEKRA attendees included Mr. Stanislaw Zurkiewicz – Chief Regional Officer of DEKRA East Asia, Mr. Michael Kuepper - Senior Vice President of DEKRA Process Safety and Dr. Guibing Zhao - Process Safety General Manager of DEKRA China.




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Train your next generation

Laboratory Scientist Degree Apprenticeship

Do you want to explore how apprenticeships might work for your organisation and provide a highly cost-effective way for you to up-skill your staff and attract new talent? If so, please get in touch with us!

Apprenticeship – what and why?

The new Laboratory Scientist Degree Apprenticeship at Manchester Met presents fantastic opportunities for the chemical industry to meet their future skills needs and create a sustainable talent pipeline.

This new four-year programme will enable you to nurture and develop your own talent, focusing on areas such as inorganic, organic and physical chemistry, scientific skills and applied chemistry for industry.

The apprenticeship will equip students with the skills, knowledge and behaviours needed to make an impact in the workplace in a short period of time. This course is delivered via a blended learning model, making it accessible to companies throughout England.

How are apprenticeships funded?

The good news is that employers choosing to take on a new apprentice or upskill a member of existing staff will be able to:

- Utilise government funding to cover 90% of the cost of tuition fees, if you have a payroll of less than £3 million, or
- Use their apprenticeship levy payments to cover the cost of tuition fees for payrolls above £3 million
- Pay no fees at all, if you are a business with under 50 employees, employing an apprentice under 19-years-of-age
- Take advantage of an additional incentive of £1,000 for hiring an apprentice under 19-years-of-age.
- No Employers National Insurance to pay for apprentices under 25-years-of-age.

Why Manchester Met?

Manchester Metropolitan University is an industry leader in the development and delivery of Degree Apprenticeships. The university now has a diverse apprentice student population of more than 650 from 130 different employers, studying on Degree Apprenticeships in areas such as digital & technology solutions, business management, as well as laboratory science.

Our industry-leading FdSc Laboratory Science programme has been running since 2011 and currently has 90 students on programme. We are now enhancing this provision to offer a 4-year Degree Apprenticeship.

Find out more about our apprenticeship programmes

Recruiting an apprentice

We are here to support you every step of the way in finding the right candidate to join your business or in identifying a suitable internal candidate to build on their existing skills. We can promote your vacancy to our list of interested candidates, add your vacancy to our website and you can attend our apprenticeship open evening to meet potential candidates first hand.

Next steps

If you'd like more information about whether an apprentice is right for your business or would like to discuss your next steps with us, please contact Rachel James on 0161247 2817 r.james@mmu.ac.uk

Catalyst to create new gallery - Harry Baker and 120 years of Chlorine!

The Catalyst Science Discovery Centre and Museum in Widnes, Cheshire, the only UK museum celebrating the history of the chemical industry, has been awarded a grant of £36,159 to create a new permanent exhibition entitled 'Harry Baker and 120 years of chlorine' which is being funded by an AIM Biffa Award, through their History Makers Project. The new exhibition in a special Baker Gallery in Catalyst will celebrate the life and work of little-known local man but distinguished chemist, Dr Harry Baker (1859-1935), who was a student of two internationally famous chemists Professor Sir Henry Roscoe FRS in Manchester and Professor Robert Bunsen in Heidelberg.

It will concentrate on his amazing work from 1897 onwards, (when he came with his family to Runcorn), on the development of chlorine production by the electrolysis of brine pumped from central Cheshire to the newly-opened factory of the Castner Kellner Alkali Company (later ICI, now Inovyn) at the site in Weston Point, Runcorn using the famous mercury rocking cells.

The History Makers scheme funds museums to create new exhibitions that will inspire the public through the lives and achievements of extraordinary, historical figures. The scheme is managed by the Association of Independent Museums (AIM) and Biffa Award, a multi-million pound fund that helps to build communities and transform lives through awarding grants to communities and environmental projects across the UK.

Project manager, Catalyst trustee and chemist, Dr Diana Leitch said "It has been the goal of Catalyst for some time to depict the work and influence of local



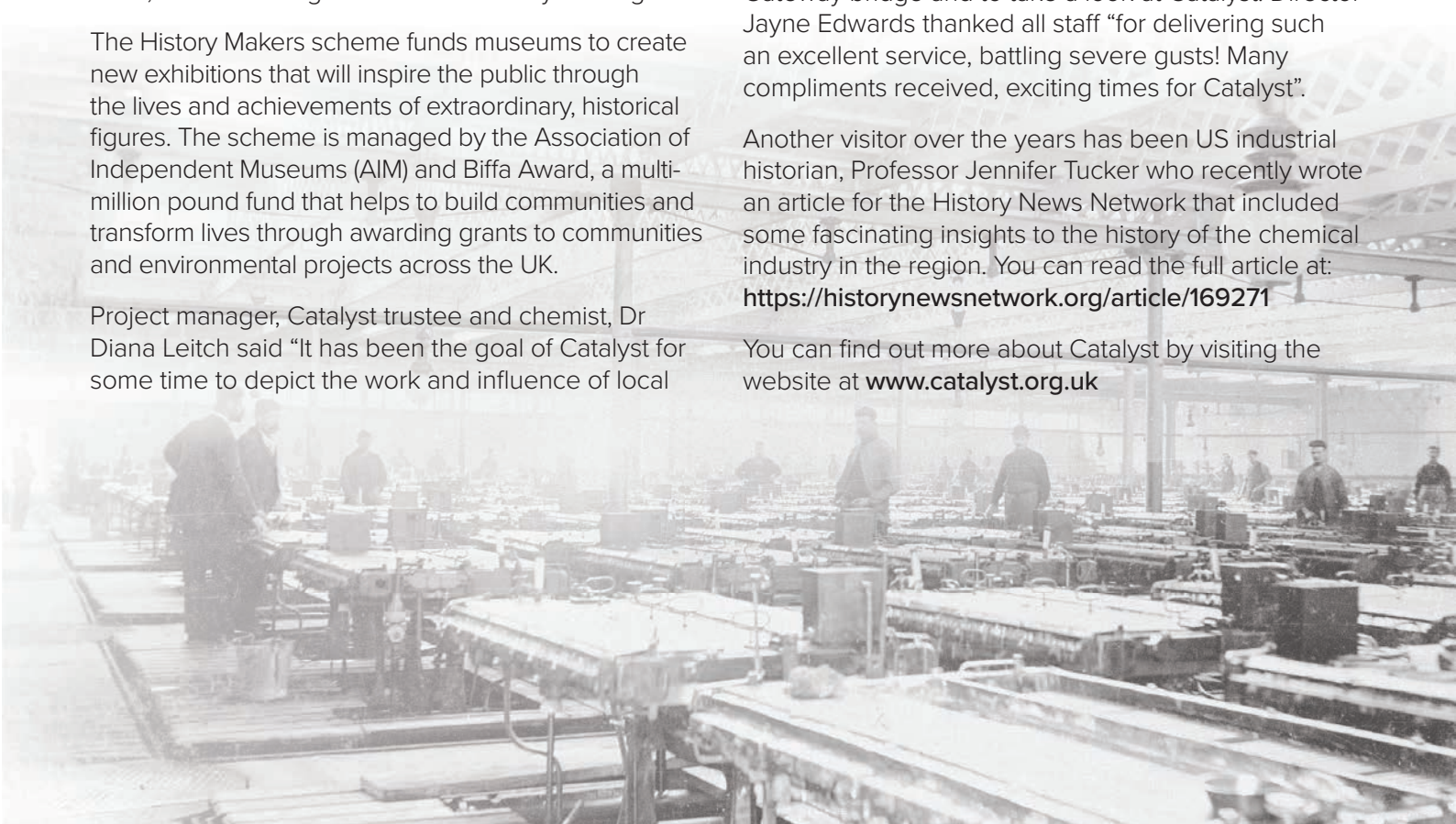
industrial chemist, Harry Baker, and to highlight the importance of this local achiever and his achievements in chlorine production to both the local and wider world and to inspire young people to follow his example. The AIM Biffa Award grant will now enable us to do that and we are extremely grateful to be receiving this money. I was born

and brought up in Runcorn and came from a family who brought the salt to Runcorn and worked in the chemical industry in the area for generations as did many local people. Chlorine has benefitted humanity in numerous and diverse ways and still does and it will be a great pleasure to see this project unfold, the work of Harry Baker to be acknowledged and celebrated and the new Baker Gallery will open in early 2019"

In other news, on 14 June 2018 HM Queen Elizabeth and Megan Markle, the new Duchess of Sussex, visited Widnes, to officially open the new Mersey Gateway bridge and to take a look at Catalyst. Director Jayne Edwards thanked all staff "for delivering such an excellent service, battling severe gusts! Many compliments received, exciting times for Catalyst".

Another visitor over the years has been US industrial historian, Professor Jennifer Tucker who recently wrote an article for the History News Network that included some fascinating insights to the history of the chemical industry in the region. You can read the full article at: <https://historynewsnetwork.org/article/169271>

You can find out more about Catalyst by visiting the website at www.catalyst.org.uk





Dura-ID Solutions is a leading chemical labelling solutions provider and UK manufacturer of specialist application tags and labels. With over 30 years of experience in the chemical industry we have the best placed solution for your business. Our expert chemicals team can assist you in sourcing the solution to suit your application.

WHAT IS COMBINATION LABELLING?

Are you currently placing your hazard warning diamonds, safety data and IMDG transport diamonds on to your chemical drums or IBCs separately, increasing production time and slowing down your team?

If this is the case we recommend investing in a combination labelling solution. This means you can print a single, large format label in full colour on-site which contains all this information and looks professional.

THE BENEFITS OF COMBINATION LABELLING

- Eliminate pre-printed stock
- Provide multi-lingual labels with high resolution printing
- Reduce labelling time significantly

- Make GHS compliance easy
- Continuous form printing with the Neuralog printing systems
- Increase staff productivity

COMBINATION LABELLING PRINTING SYSTEMS

Neuralabel 300x



The 300x is the solution for your business if faster print speeds of up to 20 inches per second are required. Even at those speeds the high print resolution is not compromised and the 2400 x 1200 dpi quality makes it ideal for multilingual or pictorial labels. This system also accepts variable labels widths down to 1.5 inches so is perfect for a business which prints lots of different sized labels.

Neuralabel 500e



This system is ideal if you need to produce one specific sized label as standard. The laser technology means that when the printer is used with Dura's Polyolefin media it is BS5609 Approved. The high-yield combination toner and drum cartridges offering long-term savings particularly when printing larger runs. Media output options means labels are always presented in a format to suit your operations be that fan-folded, cut sheets or rolls.

Contact Dura-ID Solutions to discuss your requirements today

Call us on: 0114 242 2111

Email us at: info@dura-id.com

Visit: www.dura-id.com

Dura-ID Solutions – a unified future in high specification labelling

A leading manufacturer of chemical and hazardous goods labels has gone through an amalgamation merger to encompass two other companies. IML Labels & Systems, Longcombe Labels and Leed Marque Concepts merged on 1 February 2018 to become Dura-ID Solutions.

This new entity has annual turnover in excess of £14 million, with over 100 members of staff across five sites including Sheffield, Devon, St Ives, Mansfield and Newton Aycliffe.

As experts in the field of specialist labelling, tagging, plastic mouldings and printing solutions, the merger follows a highly successful year of sales for the three businesses involved – all of which have been owned as separate entities by Goonvean Holdings. Together, Dura-ID Solutions aims to further revolutionise identification solutions in the chemical industry.

As a trusted partner within the chemical industry – IML had previously and as Dura-ID will continue to work alongside UL Safeware Quasar. Safeware Quasar assists hundreds of chemical manufacturers, importers and distributors globally to understand and achieve accurate compliance and chemical hazard communication legislation. They host a number of events worldwide to give advice to regulatory professionals and leaders within the chemical industry.

Dura-ID Solutions will continue to provide the highest specification labelling solutions to each industry that it works within.

Shaun Higgins, managing director at IML Labels & Systems said “We are very enthusiastic about the new opportunities that this merger will bring to our company. The staff at all businesses are passionate about what they do, and it felt right to go through this change. Becoming Dura-ID Solutions means that we will be able to offer a more extensive product range to every industry we specialise within. We are all looking forward to our unified future as Dura-ID Solutions.”

Paul Harris, general manager of Longcombe Labels says “This news comes from a keen interest in wanting to provide complete identification solutions for every industry, and as Dura-ID Solutions we can achieve that. Here at Longcombe Labels, all staff are proud to be joining forces and we look forward to what the future has in store for Dura-ID Solutions.”

Dura-ID have a number of unique offerings to the chemical industry. These products include the Neuralabel 600e. This revolutionary printer is ideal for large format labelling for drums and IBCs. Available in a number of media outputs including roll-to-roll for use with a label applicator system. Dura-ID also supply the Neuralabel 300x, the variable width, high definition inkjet solution for the chemical industry. Another printing solution that we provide is the OKI ES7412dn, an A4 colour laser printer ideal for sheets and creating high definition, on-demand labels.

Amongst our colour printing solutions, we provide a number of thermal transfer printers from leading manufacturers such as TSC, Zebra and TEC. These solutions range from mono colour printing to dual colour solutions to meet every requirement and budget.

A number of materials used to produce labels at the Sheffield manufacturing site are unique to Dura-ID. Our Mattrans Extreme product has an unrivalled strength adhesive on the reverse and is BS5609 approved when used with select printing solutions. If you require media alongside your printing solution, then we can provide a variety of permanent or temporary adhesive labels alongside matt or gloss finishes.

If you have any questions regarding our products or services, we are happy to discuss under no obligation to purchase.

Call our speciality chemicals team today on +44 (0) 114 242 2111, email chemicals@dura-id.com or visit www.dura-id.com for further information.



Shaun Higgins



RISK & HAZARD MANAGEMENT



"We cannot solve our problems with the same level of thinking that created them." Albert Einstein

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



Safety Risk



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.

We work across all aspects of risk, from Quantitative Risk Assessments and Predictive & Consequence modelling, through to the 'softer' risks which may affect an organisation's reputation.

Do we need to learn to share?

Over recent years there seems to be a growing emphasis on cross sector and industry sharing of information, including that relating to the latest in best practise, regulation and incidents and near misses. The benefits of sharing knowledge within industry are clear; everyone can benefit from improvements in process safety. Sharing is facilitated largely by industry based support associations and membership organisations who provide support via a number of means including meetings and publications. Despite this, is sharing as effective as we intend it to be? In this article, RAS Ltd explore the shortcomings in industry learning and how we can improve.

There are numerous trade associations, working groups and forums out there which are designed to provide an interface between industry and the regulator, and provide support for better regulation and better management of major accidents. They involve representatives of the regulator and their member companies within their specific sector, to share knowledge and best practice and to develop guidance as necessary.

Where there are many outlets for information prepared by these groups; conferences, forums and publications for example, it tends only to be received by management who are expected to relay the information from the top down. While this works for information relating to their role, a lot of guidance and best practice relates to plant and process and it should therefore be the engineers on site in direct receipt of the information. In order to ensure this, we need tighter systems on site for sharing information or to provide the workforce with access to these industry organisations. Memberships are expensive, however, and guidance comes at a cost too. With ever tightening budgets, many smaller companies simply cannot afford to keep up.

This is reflected further when you look at the demographics of industry associations and their working groups. The purpose of working groups is to bring together a representative team from industry to work together to improve regulation and compliance. Are attendees truly representative of the industry, though? Often it is the larger corporations we see

getting involved, and smaller companies do not seem to have as strong a voice. Being part of these groups takes up a lot of resource both in terms of time and money, and providing this resource is not always possible. There are ways to make working groups more accessible, however. Remote communications such as webinars are making access easier and information more available for other purposes such as training, and they could be applied in this instance too.

With the number of industry organisations in existence growing and limited resources being available, it is difficult to know which ones to be a part of, and which guidance to choose when the outputs from different working groups overlap. This could be alleviated by some transparency from the regulator in their preferred sources of information.

All in all, it seems like the solution to some of the challenges in communication via industry associations is joining up the key players: the associations themselves, the regulator, and a good representative set of workers from companies throughout the relevant sector. This highlights the importance of regional organisations like Chemicals Northwest. These organisations are a great asset to local businesses for information gathering and networking, and they hold a lot of untapped potential for creating links with representatives of sites and trade associations both locally and nationally. By facilitating networking events, drop in sessions with specialists and even inter-company learning through peer audits, for example, the latest knowledge and understanding in process safety can rapidly reach the relevant people.

Authors: Carolyn Nicholls (carolyn.nicholls@ras.ltd.uk) and Jennifer Hill (jennifer.hill@ras.ltd.uk)



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Improve exporting performance

Chester racecourse is both the oldest and smallest racecourse in England and on 22 May 2018 it was the venue for an update by Department of International Trade - NW on the latest funding opportunities for regional businesses to help with exporting. John Roche started the meeting with an introduction to the work of **Chemicals Northwest**, promoting the chemicals industry in the region and supporting businesses throughout manufacturing and associated supply chains.



Left to Right: Bohdan Ratycz, Ian Fletcher, Kevin Ledwith, Jim Colston, Sara Pomfret, John Roche

UK Export Finance (UKEF) works across several Government departments and its mission is to ensure that no viable UK export fails for lack of finance or insurance from the private sector, while operating at no net cost to the taxpayer. Export finance manager Kevin Ledwith outlined how help is given to UK exporters; to win contracts by providing attractive financing terms, to get paid by insuring against buyer default and to fulfil orders by supporting working capital loans. £15bn of support has been provided over the last five years with 7000 companies benefitting directly or indirectly from UKEF help via export supply chains.

Sara Pomfret introduced the department's export activity within its **DIT Consultancy** service. This range of services aims to enhance SME international trade performance and the approach is now underway. Sara outlined several examples of practical help available including tradeshow access, travel, accommodation and translation. Recent projects supported include attendance at a UAE trade show and conference including stand space, flights & accommodation and market research to identify key target markets in the Middle East.

Other services include: access to DIT colleagues in overseas posts – market research / contacts, country and sector specific inward delegations, personal referrals to other partner organisations e.g. UKEF and the "You Can Export" programme which is a series of workshops and masterclasses on key export areas. Go to; www.export.great.gov.uk

International trade advisor (ITA) Bohdan Ratycz has many years' experience working in the chemical industry and he outlined the key dimensions of the sector and its importance to the UK economy. There are 30 ITAs in the northwest with various specialities. The group offers masterclasses for new or existing exporters in how to do it?

Within the DIT Tradeshow Access Programme which entails £1.5k grants for SMEs to attend exhibitions and conferences, Bohdan announced the recent Northern Powerhouse trade mission to Chemspec Europe in June in Germany. There was a £200 travel allowance for SMEs to join and

commercial officers were available for free advice and guidance; "you are not alone".

In addition the department has created an export opportunities page on its website, displaying actual exporting business enquiries. An SME can search generically, with a facility to click for more details and then submit your interest. Furthermore companies can register and request alert messages for specific prompts.

There is also an overseas market introduction service where a local embassy can do work for you on the ground, including the ability to hire a room at an embassy.

Ian Fletcher represents Cheshire & Warrington LEP's **Growth Hub Service** which aims to help businesses navigate the large amount of support available in the region. From networks and specialist funds, it provides advice and enables companies to find the best arrangements.

The Growth Hub sets out to better understand what each business needs and to go about facilitating contacts for support. Ian explained what types of funding are available and how to go about securing that funding. The service also provides support with commercialising innovation, access to markets and developing your people.

The **Innovation to Commercialisation** (I2C) project is supported and partly funded by the European Regional Development Fund and seeks to help eligible SME businesses to introduce innovation into their organisations and advance commercialisation of new products, processes and services to the marketplace. Based at the University of Chester's Thornton Science Park, Jim Colston explained how the project will offer companies access to the Faculty of Science and Engineering resources together with the I2C team of engineers and specialist equipment.

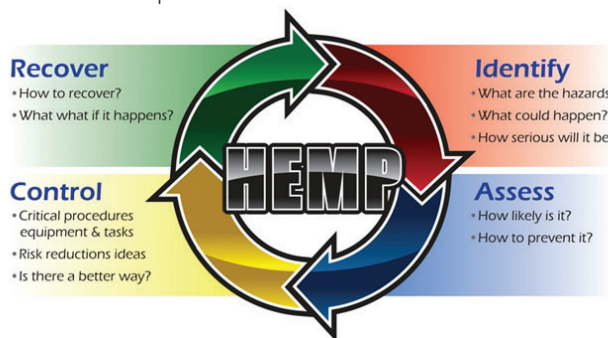
Successful commercial outcomes are being derived through; Institute of Manufacturing workshops to efficiently manage innovation, technical and engineering support intervention e.g. design, modelling, laboratory, prototypes and technical training workshops.

Please go to: www1.chester.ac.uk/i2c

How BowTie analysis helps visualise process risk management

Chemical Northwest in association with the RPS Group staged an interactive, knowledge-sharing workshop aimed at visualising process risk management in the high hazard chemical manufacturing industry. Presenters, Paul Cooke and Mark Austin explained how BowTie analysis can greatly enhance process safety management systems.

A BowTie system is a graphical representation of the relationship between the 'top event', hazards, threats and barriers. It is a means for understanding and demonstrating that sufficient controls are in place for the effective management of all process hazards and risks, across the entire business portfolio.



This approach is based entirely on the HEMP (Hazards and Effects Management Process) philosophy.

The Hazard & Effects Management Process is an 'umbrella' concept aimed at identifying hazards, assessing consequences and risks and identifying avoidance and recovery measures. It also identifies the required personnel, documents and procedures, in the form of activities and tasks to give credibility and auditability to these measures.

The workshop held on 24 April 2018 at Sci-Tech Daresbury, focused on how a typical BowTie is built from these first principles, encompassing the key features with the following definitions:

A **Top Event** is the ultimate undesired event, that is, the 'release' of the hazard or the unstable status of the hazard. Often termed first consequence, some examples of 'top events' include; loss of containment, structural failure, explosion and loss of control.

A **Threat** is a possible cause that will potentially release a hazard/top event such as, high temperature, corrosion, operator error, loss of utilities or weather related.

Barriers are protective measures put in place to prevent threats from releasing a hazard/top event. They will include

system features like control of energy release, warning alarms, safety valves, anti-corrosion coatings and good maintenance.

Within BowTie systems there will be validity rules for barriers. They should be effective in preventing the consequence when it functions as designed. A detector will detect the condition that requires action, a logic solver decides which action is to be taken, and an actuator addresses the condition.

The Barrier must be independent of the initiating event (threat) and the components of any other Barrier already validated for the same condition. Barriers cannot be considered independent from one another if there is a common cause of failure. Finally it should be reliable and auditable.

Consequences are the events or chain of events that result from the release of a hazard such as; fire, injury / fatality, asset damage or an incident leading to an environmental incident.

Recovery Measures will limit the chain of consequences arising from a Top Event. There will be a broad range of these measures ranging from Operational Systems Intended for Emergency Management and contingency plans, training, drills, to clean-up, restoration, first aid and hospital treatment.

Escalation Factors are conditions that lead to increased risk by defeating or overriding barriers or recovery preparedness measures. They could be abnormal operating conditions, being in maintenance mode or human error.

A useful BowTie diagram will enable all these elements to be laid out in full connectivity, helping management visualise the complete safe operation of the process.

To get started a risk assessment matrix (RAM) should be compiled. This is a guide to assessing the 'initial risk profile' and is based on historical evidence in the industry and within the corporation. **High** is often attributed as 'intolerable,' but this can be a misleading term and should be reserved for the ALARP assessment. **Medium** is often considered 'acceptable' which is not necessarily true and it is complacent to consider **Low** as 'we're OK'.

The risk assessment matrix is sometimes used for re-assessment of the 'residual risk profile' i.e. following the application of barriers and controls. Caution is advised here because (a) the terminology is often historical, not future tense and (b) the controls in place during the historical review may not be known, especially for industry based events.

Then starts the construction of the hazard and risks

elements relating to controls in place that help prevent an incident and the steps necessary to mitigate damages and losses. Software such as BowTieXP is available to support this construction.

BowTie analysis enables the effective management of critical and non-critical controls. It allows for the derivation of critical tasks and procedures, forming action plans assigning people and tracking techniques. It assists with incident investigations, document management, auditing and reporting

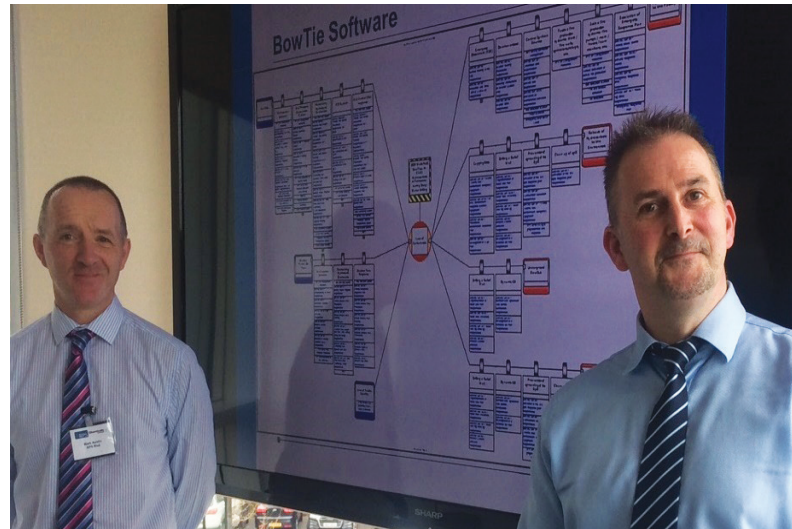
The software enables the creation of a real-time visual system that manages the complex elements of your process safety system. They can be fully customisable helping achieve the requirements of the risk management standard ISO 31000:2009.

It is understood that the regulator is keen to recommend operators adopt BowTie analysis in their process safety management systems. Furthermore, there is an expectation that they will be featured in the high hazard regulations within the near future.

BowTie analysis provides a pragmatic approach that is recognised by the UK regulators. Dashboard reviews help management and the workforce see the status and

management of risk within a business. It will ultimately help protect your people, assets, environment, reputation and security.

For more information please contact Mark Austin at RPS Group mark.austin@rpsgroup.com or **07483 903 855**



Mark Austin and Paul Cooke

Safety days and vehicle unloading operations

On 24 May 2018 Aila Bursnall, CIA Responsible Care executive, chaired the latest meeting of Mid-Cheshire and Manchester cell, hosted at the Innovation Centre, Sci-Tech Daresbury. It was a full house with some new faces, giving a lively session with lots of discussion and sharing of best practice.

Around the table discussions included the importance of risk assessment, hierarchy of controls, and hazard awareness, with many sites having conducted specific training to highlight hazards. The group also discussed the benefits of holding Safety, Health and Environment Days on site (or in some cases a whole week), as a way to down tools and concentrate on closing outstanding safety actions, engaging in safety observations, completing defect only maintenance work and conducting defibrillator and first aid training.

A special session was held relating to good practices in vehicle unloading, with current guidance highlighted and the use of strict vehicle standards (in some cases the use of own hauliers). This relates to vehicle/people segregation, driver control for safety during un/loading along with the use of pictograms for communications clarity. Also listed were: reversing sirens, warning lights and tools to aid loads being secured from ground level (eliminating the need for working at height).



Responsible Care

The Health & Safety Executive reviewed the learning's from unloading incident investigations, especially as the highest number of fatalities per category (2016/17) were due to being 'struck by a moving vehicle', in addition to the findings of the Grenfell Tower review. Also noted were the additional notification requirements for work under the revised Ionising Radiation Regulations (IRR17).

The Environment Agency provided background to its Strategic Review of Charges work, as well as reminders about the importance of assessing flood risk at sites. For further information, please contact Aila at: bursnalla@cia.org.uk



Lakers

Since the 1960's we have been providing detail design, piping and mechanical services for the, nuclear, power, energy from waste, pharmaceutical, food, brewing, chemical, agrochemical, oil & gas, healthcare & aerospace process industries, including project or term service contracts.

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We operate on a national basis backed by accreditation's to - ISO9001:2015, ISO3834-2:2005 & OHSAS18001:2007

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- Pipework installation
- High integrity welding

- Mechanical equipment Installation
- Pipe supports
- Pipe bridges
- Pipe racks
- Process modules
- Technical support for compliance with the Pressure Equipment Directive (PED).
- Shutdowns & outages

Modular Construction

Provision of cost-effective modular construction services via LVE subcontractor or customer design teams to provide constructability expertise for:

- Pre-Assembled Units (PAU's)
- Pre-Assembled Pipe-racks (PAR's)

Working this way, we can assist clients to reduce project timescales and the risk of construction issues. Other benefits include offsite fabrication in a controlled working environment, reduced expensive on-site hours and reduced risk of on-site incidents.



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Joint Managing Director

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Dron & Dickson Ltd

Electrical and electronic equipment such as lighting, switches, motors, generators, transformers, circuit breakers and relays produce significant amounts of heat, arcing and sparking during normal and abnormal operation, which could pose a substantial risk of fire or even explosion in facilities where chemicals are manufactured, processed or utilized. To minimize the risk of fires or explosions that could result in hazardous (classified) locations, it is critically important that special electrical/electronic equipment be installed.

Dron & Dickson Ltd are recognised market leaders in the supply and maintenance of hazardous area, industrial and marine electrical equipment.

What makes us unique

- Rapid response
- Experienced CompEx sales team
- Diverse/extensive product range
- Lifecycle solutions
- Extensive stock holding
- Next-day UK deliver on stock items
- In-house technical authority
- Comprehensive reporting capabilities

Key service offering

- Certified junction box assembly
- LED lighting
- Control station assembly
- Cable containment stock holding
- CompEx training centres
- Engineering services management division
- IRITA accredited rope access

Over 90 years of experience and exceptional customer service sets us apart from our competitors. Our objective is to exceed our clients' expectations, by providing services that are innovative; cost effective and based on quality, experience and diligence.



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Glacier Energy Services

Glacier Energy Services is a UK-based energy services group operating across the oil and gas, renewables and industrial sectors internationally.

Glacier provides specialist services, products and engineered solutions for new and existing energy infrastructure, delivered onsite and from its workshops in Aberdeen, Glasgow and Birmingham.

Glacier provides products and services for onsite machining, the design, maintenance and repair of heat exchangers and pressure vessels, conventional and advanced non-destructive testing and welding solutions, including cladding, overlay and turnkey, offered as stand-alone

or integrated offerings to provide greater value and cost efficiencies for its customers

The company was formed in 2011 through the acquisitions of Roberts Pipeline Machining and Wellclad. The company grew through further acquisitions of Site Machining Services, Ross Offshore and Professional Testing Services in 2012, 2013 and 2014 respectively.

Glacier is committed to delivering the highest standard of service to all of its clients and aims to achieve best-in-class HSEQ performance in every aspect of its work.



Glacier
ENERGY SERVICES

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Altrad Services

Altrad Services is an international leader in the provision of critical industrial services principally to the energy, infrastructure and natural resources sectors. The multi-disciplinary service we offer includes access systems, insulation, specialist coatings, passive fire protection, engineering services, refractory linings, environmental services, oil and gas storage tanks and heat exchanger replacement and refurbishment.

Altrad Services delivers safe, reliable and intelligent solutions both on and offshore, employing over 8,000 across the UK.



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Otto Simon

Otto Simon is a process-led engineering consultant and project delivery organisation based in Manchester, UK. We work successfully with a wide range of clients in the UK, particularly in the Northwest, to provide services to the chemical engineering and thermal treatment industries. Our services cover the full spectrum of project delivery from consultancy and concept design through detailed design to EPCm, owner's engineer, operation and maintenance. With origins dating back to the 1870s, Otto Simon provides a unique blend of hard earned experience with a dynamic approach to the business expectations of today's operators and investors.

Our consultancy services are underpinned by extensive practical experience in project development and delivery, as well as in plant operations and maintenance. We have a flexible and professional workforce dedicated

to understanding our customers' needs to deliver innovative and commercially viable results. Our process engineering and process safety team has particular expertise in developing technologies in the waste to energy, coal and coke processing and biotechnology sectors, and are experienced in providing services to project developers, technology companies, established process plant operators, and to the financial sector.

Otto Simon is certified to ISO 9001 (2015) and OHSAS 18001 and all of our engineering services are managed to third party approved integrated management systems. Health and safety is integral to our core values and Otto Simon is proud to be a RoSPA member. Our continual improvement plan for HSEQ ensures that all projects are delivered to the highest HSEQ standard. We were recently awarded a RoSPA Gold Award for our achievements in health and safety.



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Clarke Energy

Clarke Energy is a multinational specialist in the engineering, installation and maintenance of reciprocating engine-based combined heat & power (CHP) plants. Our offering ranges from the supply of an engine, through to the turn-key installation of a multi-engine power plant. Our facilities deliver fuel efficiency, dramatically lower energy costs and help reduce carbon emissions, making CHP the ideal solution for the industrial sector.

If a company's spend on energy exceeds £25k per annum, Clarke Energy will provide a free detailed feasibility study, and advise on the best CHP solution for your business. We provided dedicated support from initial sale through to the long-term maintenance of your power generation equipment.

CHP systems provide a stable supply of electrical power that, if needed, can be isolated from the local electricity grid. Heat can be recovered either as hot water or steam. In addition, if there

is a local need for cooling power, heat can be fed into an absorption chiller providing a source of cold water. Cold water can in turn be used to support a refrigeration or air conditioning system. Systems providing electricity, heat and cooling are called trigeneration plants. This can be taken one step further for industrial users that require carbon dioxide. Carbon dioxide can be recovered and scrubbed from the engine exhaust to the highest standards. There are various applications for this carbon dioxide including the food and drinks industry and greenhouse applications.

Clarke Energy®

A KOHLER COMPANY

Engineer - Install - Maintain

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Do you need to install Eel protection measures?

Regulations came into force in 2000 to implement EU legislation aimed at reversing the worrying decline in the European eel population. Eels have a complicated lifecycle which includes a slow migration up rivers, metamorphosing as they go, before migrating back to the Sargasso Sea to spawn several years later. They are therefore very vulnerable to man-made hazards such as dams or other obstructions in watercourses and entrainment at abstraction points.

The Eels (England and Wales) Regulations 2009 require obstructions to be removed from watercourses, or eel passes to be provided, and screens to be fitted to water intakes and outfalls. From 2015 onwards, the “responsible person” - the owner, occupier or person in charge of the land in question - must screen intakes and outfalls unless the regulator has specifically exempted them. This applies to abstractions of at least 20m³/day and to discharges.

The screening requirements for process cooling water abstraction points, for example, can be surprisingly expensive to meet, given the mesh size needed to catch the tiny glass eels found in estuaries and the lower reaches of rivers and the

consequent need for reliable automatic cleaning mechanisms to ensure continued flows of cooling water and thus business continuity. The Environment Agency has taken a risk-based approach, issuing exemptions to give time for existing intakes and outfalls (as well as obstructions) to be made compliant. Where there is a low chance of eels being impacted but the necessary measures will be costly, the deadline could be as late as 2027, but higher priority sites will in most cases have to comply much sooner.

Any business that is currently benefiting from an exemption would be well advised to check the termination date and to enter discussions with Agency about how compliance might be achieved most cost effectively. In certain cases it might be instructive to obtain ecological data to justify certain outcomes. Such data should normally cover Autumn and Spring eel migrations in order to be robust, and will need to be scheduled well in advance. Agency may even grant permanent exemptions to abstraction structures that can be shown not to affect eel migration, perhaps because the area in question is not naturally colonised by eels.

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our services

regulatory
environmental
nuclear
commercial
construction
tax & green incentives
litigation
employment



Supply Chain
Charter for Nuclear
Decommissioning
Sites Signatory

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/>

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.

Hosokawa Micron Ltd

Integrated powder processing technologies including: size reduction, air classification, mixing, drying, containment equipment such as glove boxes 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.

Innovative Packaging Solutions Ltd

A top tier COMAH operation offering many handling services: re-packaging of any class liquid chemicals from bulk isotankers, road tankers, IBCs and drums. Decanting, dosing and sampling. Packaging: HT pallets, strapping

and shrink wrapping. Labelling of receipts and despatches. Storage services including: inside, outside or temperature controlled.

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 a 'return to base' option.

Rain for Rent International UK

Temporary liquid handling solutions including newly designed storage tanks, filtration units and spill containment. Combining a storage tank with E-Contain Spillguards, Spillguard Hose Bridges and SolidGround Traction mats will provide a complete containment system protecting your workforce, project and the environment.

Warrant Group Ltd

Freight and logistics services and a founder member of EURTEAM, a dynamic, chemicals network specialising in international supply chain solutions for the chemical sector. CDI accredited and hold AEO status. Customer service staff hold hazard familiarisation certificates. Diverse chemical sector client portfolio, each with different complexities and a bespoke solutions requirement.

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 chemical 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.

Manchester Metropolitan University

Vocational training and applied research. The Division of Chemistry and Environmental Sciences trains undergraduate and postgraduate students in chemical, environmental, pharmaceutical and polymer science and technologies. Continuous professional development, consultation services and contract research facilities.

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.

University of Chester

Faculty of Science & Engineering offers new degrees in chemical engineering, electronic & electrical engineering, mechanical engineering, natural sciences alongside established degrees in mathematics and computer science. Close links to local chemical companies with student placements and collaborative research projects.

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

Altrad Services

An international leader in the provision of critical industrial services principally to the energy, infrastructure and natural resources sectors. The multi-disciplinary service includes access systems, insulation, specialist coatings, passive fire protection, engineering services, refractory linings, environmental services, oil and gas storage tanks and heat exchanger replacement and refurbishment.

Chem Resist Group Ltd

Design, manufacture and installation of corrosion resistant process plant. A wide portfolio of thermoplastic process plant, an extensive range of pumps and ancillaries and complete pipework installations, upgrades and repairs. Aggressive and corrosive applications for pumps (1m³/hr to 1000m³/hr, heads to 100m) valves and level controls.

CRANE ChemPharma & Energy

A global manufacturing and sales organisation supplying a wide range process equipment and fittings, including DEPA air operated diaphragm pumps and ELRO peristaltic pumps.

Croft Filters Ltd

Manufacturer of customer specific filters, in any shape or size and popular styles such as; cones, cylinders, baskets and screens. Materials include: wire mesh, perforated plate or expanded metal with production varying from "one-offs" to larger repeat orders. Perforated plate which can be custom punched to precise specifications.

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 Ltd

The supply and maintenance of hazardous area electrical equipment. Working together with our clients, our Engineering Services Management and Wholesale divisions are able to offer bespoke solutions incorporating the very latest industry standard and safety legislation. From initial concept, incorporating the latest products from the leading manufacturers with tailored maintenance solutions.

Glacier Energy Services

Onsite Machining; design and manufacture of equipment for precision pipe cutting and onsite machining. Heat Exchanger design, manufacture, repair and refurbishment. Welding. NDT services performed by highly qualified technicians. Provision of turnkey solutions in respect of surface and subsea production equipment. Great customer value, highest standard of service and best-in-class HSEQ performance.

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.

ICAM Engineering Ltd

Enviably track record in producing high quality, safety critical products and services, which include; orbital welding, manual TIG & MIG welding, machining both CNC & manual, electro-polishing, installation/modification of gas & fluid handling systems, instrumentation cabinets & panel assembly and 3D engineering design.

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.

Oranmore Environmental Services Ltd

Full turnkey solution for above and below ground infrastructure, ranging from structural surveys to full repair and maintenance of drainage systems, chambers, sumps, pipes, tanks and associated assets. Minimum downtime and disruption for our clients.

Perry Process Equipment Ltd

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

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.

Engineering project management

Bouygues E&S Contracting Ltd

Specialist lifecycle solutions partner offering consultancy. Multi-disciplinary services include: design, architectural, civil & fit-out, construction, mechanical engineering, HVAC & building services, electrical engineering, commissioning, integrated system test and facility management.

Fichtner Consulting Engineers Ltd

International engineering and project management. Provision of mechanical, electrical, process and chemical engineering design services. Strong focus on thermal combustion and full range of processes associated with power applications. Recent growth in renewable energy sources such as: solar, anaerobic digestion and onshore wind projects.

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. Part of PM Group, a 2,200 strong, employee owned company operating across Europe, Asia and the USA.

Engineering, IT & process consultants

ABB Consulting

Technical and engineering services to help companies in the global process industries achieve operational excellence. Expertise in inspection, integrity management, operations improvement, process safety, project services, site and asset regeneration, technical engineering, software and training and competency. Pragmatic solutions based on technical excellence and industry expertise.

BPE Design and Support Ltd

Progressive and innovative process engineering consultancy. Extensive process development and scale-up experience and process modelling and simulation is a core expertise. Early stage concept and feasibility studies as well as subsequent design, commissioning and qualification stages. Independent HAZOP chairing, ATEX/DSEAR assessments and SIL/LOPA studies.

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.

Know your supply chains

HFL Consulting Ltd

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.

Peak42 Ltd

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.

Reliable Manufacturing

Reliability-based change management consultancy. A pragmatic approach delivers improved asset availability, reduced operating costs, improved HSE performance and increased employee motivation and satisfaction. Support with implementation of operations and maintenance best practices which facilitate organisational cultural change. A unique range of effective workshops, tools and masterclasses, help get the messages over.

Siemens Digital Factory & Process Industries and Drives

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

Terrington Data Management

Provision of mobile computing and software systems that enable users to implement effective maintenance and Ex inspection strategies. Software helps users demonstrate compliance with increasing legislation such as DSEAR/ATEX 137. Use of rugged PDAs, android devices and RFID in collection of management of safety critical data, provides an auditable asset history.

Environment, health & safety risk management

BakerRisk Europe Ltd

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

Chemical and Industrial Consultants Association

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

Haztech Consultants Ltd

Integrated solutions in process safety management, hazard identification, risk assessment, regulatory compliance support & training. A 6-stage Hazard Study process, safety cases, human factors studies, basis of safety criteria, occupied buildings studies and SIL assessments. Compliance training for COMAH, ATEX & DSEAR, EPR and SED.

HSD Safety Ltd

Valued experience in providing accurate analysis of hazards, identification and assessment of controls and pragmatic advice for further improvements. Services include: hazard identification (PHA, FTA, FEMA, HAZOP, LOPA/SIL, QRA), fire risk assessments, COMAH/Seveso support, bespoke training and legal representation.

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.

Deloitte UK

Provision of the full range of financial and business services including: auditing & assurance, mergers & acquisitions, global business tax and strategic capital and human consulting. Expert risk advice is available in the areas of finance, operations, cyber security, regulatory and reputation.

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.

Falck Fire Services UK

A leading, global and dedicated emergency services provider and fire-fighting specialist to high risk industries. Tailored outsourcing contracts and a high quality integrated fire protection system. Incident fire training courses

for emergency response teams, including practical scenarios. Consulting services specialising in fire and explosion hazard management.

Grant Thornton UK LLP

One of the world's leading organisations of independent advisory, tax and audit firms. We help dynamic organisations unlock their potential for growth by providing meaningful, forward looking advice. Provision of assurance, tax and advisory services. A dedicated Innovation practice that has an enviable track record of working with successful and dynamic companies to realise their ambitions for growth.

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.

Miltec Digital Ltd

Bespoke marketing solutions that support lead generation, brand awareness and customer retention. Web development that highlights your brand to potential customers, search engine marketing to increase visibility, digital marketing and design & branding to showcase your products and services. Cutting edge platforms and state of the art marketing strategies.

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.

Thornton Science Park

Enterprise Zone status offers cost effective corporate headquarters including research & development and manufacturing capabilities. Office space available plus fully equipped laboratory or workshop space. Innovation in energy, environment, automation and advanced materials. Business support through access to academic experts and student resource for short term projects or placements.

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.

Vision Consulting Group

Full service marketing consultancy focusing on strategic planning, tactical marketing and creative skills. Support in branding, CRM, research campaigns and proposition development. Direct marketing, public relations and event management. Expertise to help with copywriting, graphic design, website development and creative briefs.

Laboratory products, testing and services



BioReliance

A leading global contract services company in the area of product safety. We specialise in genetic toxicology screening and GLP assays. Whether requiring pre-clinical toxicology for hazard assessment for REACH registrations or other regulatory studies; BioReliance has all the expertise needed to design and execute your genetic toxicology.

Chilworth Technology Ltd

Process safety testing services aimed at helping companies avoid major incidents such as fire, explosion or loss of containment. Combining process safety engineering and management expertise with the use of test data allows us to help clients achieve the most effective and practical approaches to safe and efficient processes.

Kindlow Safety Services

Provision of process safety testing and consultancy. Understanding of needs to control hazards such as dust explosions, thermal decomposition and runaway chemical reactions. Fully equipped laboratory and experienced team help achieve your safe operating conditions. Other services include: HAZOP, aerosol safety, REACH testing and process safety training.

Labtex Ltd

Suppliers of leading laboratory products and process scale-up equipment. The list includes: HUBER liquid temperature control systems, DIEHM glass reactors to 100 l, PREMEX and AMAR high pressure autoclaves, POPE wiped film or short path evaporation and distillation, Nutsche filter dryers and many more.

Metrohm UK Ltd

Quality instrumentation and support. Tailor-made applications to safe-guard product quality, optimise processes and ensure compliance with regulations. Provision of instruments for the following: titration, Karl Fischer, spectroscopy, electrochemistry, ion chromatography, pH/ion measurement, stability measurement and on-line & process analysers. After care services, application support and a training academy.

Scientific and Medical Products Ltd

Distributor of laboratory and process equipment with sales, service and support of innovative and world class products to customers in industry and academia. Applications laboratory for sample trials and product demonstrations along with a test facility for equipment assembly, service and repair.

Smithers Viscient

Environmental 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, endocrine 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.

DLA Piper UK LLP

A global law firm located in more than 40 countries throughout the Americas, Europe, the Middle East, Africa and Asia Pacific, positioning us to help clients with their legal needs wherever these choose to do business.

E3 employment Law LLP

Specialising in employment law. The resolution of the full range of employment law and industrial relations issues to suit individual businesses. Delivering employment law advice which provides outstanding commercial value.

Marks & Clerk LLP

Intellectual property services, advising start-ups, SMEs and multi-nationals with large global IP portfolios. Comprehensive range of IP services covering patents, trade marks, designs and copyright. Obtaining protection worldwide, portfolio management, strategic and commercial advice, licensing, enforcement, due diligence, valuations and litigation.

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".

Womble Bond Dickinson (UK) LLP

A strong strategic focus on the chemicals sector, understanding the market, the structure and the legal and regulatory regime in which our clients operate. Assistance on day-to-day issues to major multi-national corporations and rapidly growing SMEs operating in the sector.

WP Thompson

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

REACH and chemicals services



Baytouch Ltd

Internet-accessed subscription based services that support regulatory compliance in the global chemical industry. Solutions include: ProductTraQ – substance volume tracking and supply chain management, PSMonitor – workplace safety management software for high hazard facilities, ReachSuite – SIEF management and other REACH compliance features. Innovative software-as-a-service solutions.

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!

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SIAM (Soluciones Informaticas Ambientales)

Information technology and software solutions. Includes the software for the generation of SDSs, labels and transport documents in relation to European legislation. Assisting companies in compliance with regards REACH, CLP, GHS, etc.

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.

The ACTA Group

Assisting companies with complex compliance issues under multiple regulatory schemes, including N American, EU, S American, Asian and Pacific rim regulatory programmes. Expertise in

product approvals, product review and REACH compliance. Provision of REACH registration dossier submission, lead and joint registrations.

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Science Recruitment Group

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TransitionPlus Ltd

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- Helping new entrants to join the chemical sector CCA
- Working with participants to support their compliance with CCA obligations including collecting and reporting data on performance against targets to EA
- Negotiating with Department for Business, Energy and Industrial Strategy (BEIS) to agree CCA targets for the sector and its participants
- Helping members to manage their Climate Change Agreements and save on energy tax

www.cia.org.uk

CIABATA is the subsidiary company of the Chemical Industries Association, which manages and administers the chemical sector climate change agreement (CCA) with the Department for Business, Energy and Industrial Strategy (BEIS) and the Environment Agency (EA) on behalf of participating members.