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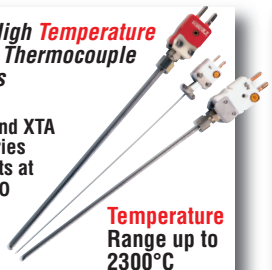

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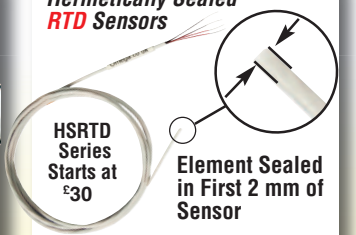

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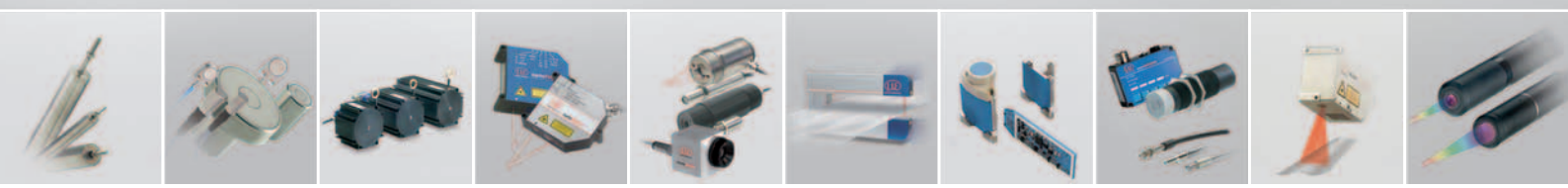

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Editor
Paul Fanning
pfanning@findlay.co.uk

Deputy Editor
Justin Cunningham
jcunningham@findlay.co.uk

Deputy Web Editor
Laura Hopperton
lhopperton@findlay.co.uk

Group Editor
Graham Pitcher
gpitcher@findlay.co.uk

Art Editor
Martin Cherry

Technical Illustrator
Phil Holmes

Advertising sales
01322 221144

Sales Manager
Luke Webster
lwebster@findlay.co.uk

Deputy Sales Manager
John Gordon
jgordon@findlay.co.uk

Account Manager
Tricia Bodsworth
tbodsworth@findlay.co.uk

Sales Executive
James Slade
jslade@findlay.co.uk

Production Manager
Heather Upton
hupton@findlay.co.uk

Circulation Manager
Chris Jones
cjones@findlay.co.uk

Publisher
Ed Tranter
etranter@findlay.co.uk

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Opening up the road to success

Paul Fanning, Editor (pfanning@findlay.co.uk)

In this month's interview piece (see page 18), James Baker, managing director of BAE Systems' Advanced Technology Centre, advocates what he terms 'open innovation', whereby companies such as his could benefit from a more flexible approach to collaboration with external agencies such as academia and SME's.

Of course, proposals to collaborate are not new things. It is fairly common to hear companies claim they collaborate effectively with others. What is unusual about Mr Baker's idea, however, is that he proposes surrendering some of the knowledge, technology and skills that BAE has developed in order to achieve greater commercial benefit.

To many people nurtured in an environments where such knowledge and intellectual property are regarded as the crown jewels of the business, such an approach must seem baffling. However, as Mr Baker points out, "100% of nothing is nothing". In other words, intellectual property is only valuable if you can make it commercially successful. Thus, he believes, it makes more sense to surrender some intellectual property to ensure success than to risk sacrificing success in favour of retaining intellectual property. And, he argues, by tapping into the wealth of ideas outside BAE Systems, he can ensure that the company stays in the lead both technologically and financially.

Put like that, of course, such an argument would appear to make sense. However, such collaboration is easier said than done. It relies on finding the right partner(s), each partner's strength complementing those of the others and all parties being prepared to deal honestly and openly with one another. With those caveats in place, however, Mr Baker's argument that it no longer makes sense for a single company to work in isolation is a powerful and persuasive one.

Engineering design show

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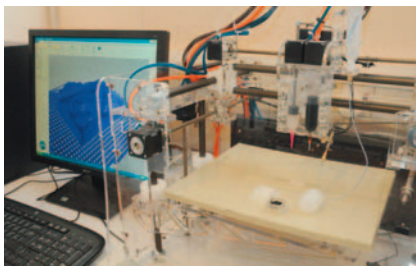
3D printing technique could revolutionise healthcare



A 3D printing process developed at the University of Glasgow could revolutionise the way drugs and other chemicals are made in the future, and even enable consumers to create customised medicines at home.

Using a commercially available 3D printer operated by open source CAD software, a team led by Professor Cronin built a system called 'reactionware', special vessels for chemical reactions which are made from a polymer gel which sets at room temperature.

By adding other chemicals to the gel deposited by the printer, the team has been able to make the vessel itself part of the reaction process. While this is common in large scale chemical engineering, the development of reactionware makes it possible for custom vessels to be fabricated on a laboratory scale.

Professor Cronin said: "It's long been possible to have custom lab materials made to include electrodes, for example, but it's been expensive and time consuming. We can fabricate reactionware vessels using a 3D printer in a relatively short time. Even the most complicated vessels we have built only took a few hours."

By making the vessel itself part of the reaction process, the distinction between the reactor and the reaction was said to become 'hazy'. Cronin adds: "It's a new way for chemists to think, and it gives us very specific control over reactions because we can continually refine the design of our vessels as required. For example, our initial reactionware designs allowed us to synthesise three previously unreported compounds and dictate the outcome of a fourth reaction solely by altering the chemical composition of the reactor."

The team comprised of researchers from the University's School of Chemistry and School of Physics and Astronomy is also considering the long term implications of developments in 3D printing technology.

www.gla.ac.uk

Stars of Make it in GB exhibition revealed

The Government has revealed the manufacturing companies that will feature in the Make it in Great Britain exhibition, being held at the Science Museum in London later this year.

Engineering giants such as Siemens, McLaren, Airbus and Messier-Dowty will join the likes of luxury yacht maker Sunseeker, the Royal Mint and Coca-Cola at the event which takes place during the Olympic and Paralympic Games this summer.

The exhibition will showcase manufacturing diversity, from the bean-to-bar journey of a Mars bar to the on-demand passenger pods at Heathrow's Terminal 5 developed by Ultra Global.

Also on show will be E2V's macro camera black box, showing telescopic, planetary and earth images, and MRI magnets made at Siemens' Eynsham, Oxfordshire plant, a former Best Factory Award winner.

Business minister, Mark Prisk, said: "We have selected a really exciting mix of exhibits, from the manufacture of MRI magnets by Siemens, to the secrets behind McLaren's winning team.

"I hope that as many people as possible visit the exhibition and see all of the great examples of British design and manufacturing – it will be spectacular."

The exhibition will be open from 24 July to 9 September, and is free to visit.

makeitingreatbritain.bis.gov.uk

Engineering Design Show 90% booked

Findlay Media's Engineering Design Show is now more than 90% booked, with just seven exhibiting stands left.

The show, whose headline sponsors include Schaeffler, Heidenhain, Altium and Premier EDA Solutions, is the only one of its kind catering specifically for the needs of today's design engineers, regardless of the industry in which they work.

Due to take place at the Ricoh Arena in Coventry between 10th and 11th October 2012, it will include a comprehensive conference, exhibition and practical workshop programme.

Since its launch, the Engineering Design Show has been extremely well received amongst trade bodies and institutions with many including IMechE, UKEA, ETN, Intellect and Profibus having pledged their support.

New exhibitors include ML Electronics, Anixter Components, Muffett Gears, Abssac, K.D. Feddersen UK, GGB and TRW Conekt.

"I'm delighted with the response from industry suppliers, stakeholders and of course from design engineers themselves," said Findlay Media's executive director, Ed Tranter. "After extensive research we are confident of providing a high quality event tailored specifically to the needs of design engineers."

For more information, visit www.engineeringdesignshow.co.uk or contact Luke Webster at lwebster@findlay.co.uk

Engineering design show

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Briefs

OBJET TO MERGE WITH STRATASYS

Stratasys and Objet have agreed a definitive merger agreement under which both companies will combine in an all stock transaction with a combined equity value of approximately $1.4billion.

The transaction is expected to position the combined company, which will retain the name Stratasys, as a leader within the 3D printing and digital manufacturing industry.

David Reis, current chief executive officer of Objet, will become chief executive officer of the combined company.

Scott Crump, CEO and chairman of Stratasys, said: "Today marks a significant milestone for Stratasys and an important development for the 3D printing and direct digital manufacturing industry. We are bringing together two of the most innovative and respected players in the field to create a global leader in a high growth industry.

"Together we will have a broader and more comprehensive product and technology portfolio with the resources, team and financial strength to achieve our goals. Building on the success of both companies, I'm confident that we will capitalise on the many opportunities this combination creates."

According to a statement, the combined company will have dual headquarters in Israel and the US.

www.stratasys.com

IMechE fears damage from career advice changes

A policy statement by the Institution of Mechanical Engineers says the proposed changes to school career guidance may lead to a shortage of people pursuing careers in critical sectors like engineering and hamper the UK's economic recovery.

Dr Colin Brown, director of engineering at the Institution of Mechanical Engineers said: "The UK's career advice system is still sorely lacking. We need to be boosting funding to ensure we can steer talented young people into careers which are vital to the country's future like engineering and science.

"Instead the country is cutting funding, scrapping face-to-face counselling in schools and there is still insufficient involvement from industry.

"We need the people in industry who are creating these jobs to provide careers advice, particularly given that many teachers and career advisors are unaware of the realities of working in different industries.

"It could prove hugely damaging to the country's economy if we do not address the issue of substandard careers advice, with many industries losing out on employing talented individuals."

The UK needs 31,100 graduate engineers every year for the next five years in order to meet industry demand.

www.imeche.org

Siemens conference gets BAE Systems ATC keynote

James Baker, managing director of BAE Systems Advanced Technology Centre, is to provide the keynote at Siemens' major 'Answers for Industry' conference being staged at the Manchester Central Convention Complex on the 4-5 July.

Baker believes that to remain competitive industry must be more resourceful and creative than ever before – and that means understanding the need to look beyond the walls of our own companies and to forge relationships across industries, markets, SMEs and academia.

Focusing on BAE Systems Advanced Technology Centres business model as the exemplar, he will outline the impressive potential, all the way from inspiring the next generation of engineers to embracing unconventional stimuli for research and technology – including projects inspired by nature.

For global manufacturing giant Siemens, this major event is all about fostering an understanding of how boosting investment in the UK and Ireland's industrial infrastructure can help UK manufacturers overcome challenges all the way from skills to compliance, productivity and efficiency.

Delegates at this year's Siemens conference and exhibition will hear the views of leading industrialists, policy makers and operational engineers on how these isles can drive factory and plant efficiencies.

Juergen Maier, Siemens Industry Sector UK and Ireland managing director, said: "The key challenge we face in the UK is that we underperform on investment, in technology and manufacturing plants in comparison with other industrial nations.

"This conference will explore the opportunities to address this challenge, while offering manufacturing the requisite profile and support that it deserves."

Other speakers range from HSE chair Judith Hackitt who will be outlining the challenges manufacturers must meet while boosting operational efficiency. And also Chris Biddle, manufacturing systems executive at Rolls-Royce, who will explain the value of a secure data platform to provide increased visibility and control with closed loop processes based on integrated PLM and MES.

www.industry.siemens.co.uk

*** To see an interview with James Baker, turn to page 18**

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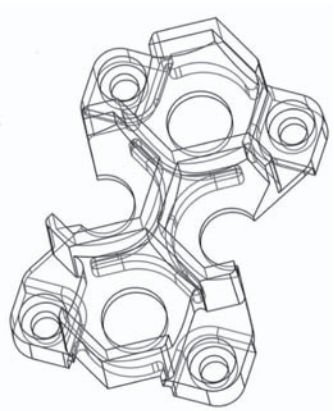

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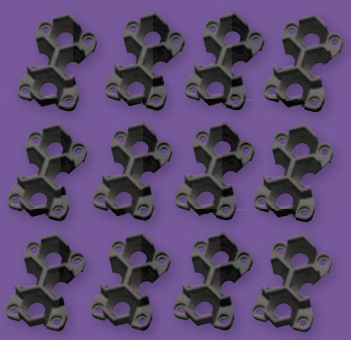

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High power in a small package

The next generation of frequency converters from Danfoss are offering an extremely high efficiency rating of over 98%.

The D-Frame VLT requires less panel or wall space than previous models which were already some of the smallest in their class, adding installation flexibility while reducing installation costs.

The size of the enclosures has been reduced by up to 68%. Despite the dimensional reductions, the drives still incorporate DC chokes and EMC filters.

The new enclosures are available in IP20 for panel mounting and IP54 for direct wall mounting. This proven concept uses a ducted back channel to pass cooling air over the heat sinks. This allows 90% of the heat losses to be exhausted directly outside of the enclosure, improving reliability and prolonging life by dramatically reducing temperature rise and contamination of electrical and electronic components.

Additional mains input options are available for the enclosures, which in the past were normally only associated with higher power drives. This means that users will be able to order units with fuses, mains disconnect, contactors or circuit breakers. These optional extras can be ordered individually or in combination, and are housed in an enclosure extension that only slightly increases the height while retaining the slim, compact design of the drive.

www.danfoss.co.uk

Schaeffler extends table bearing range

Schaeffler has extended its range of rotary table bearings for multi-axis simultaneous machining applications with two new bearing series. The YRTC and ZKXDF series are available with inside diameters from 580mm up to 1030mm and offer a variety of technical advantages such as reduced friction, increased rigidity and operating speeds, as well as more compact designs.

The demand for larger rotary table bearings with reduced friction and increased speed capability is growing. To meet this demand, Schaeffler's YRTC range of rotary table bearings is available with IDs from 580mm up to 1030mm. The design of the bearings is based on a combination of Schaeffler's YRT and RTC series of rotary table bearings. This provides the basis for extremely dynamic rotary axes for rapid positioning and for form milling using multi-axis simultaneous machining. Operation at continuous speeds, for example, in intermittent turning, is also possible within the operating limits. Compared to traditional combination thrust and radial cylindrical roller bearings, power dissipation is also significantly reduced.

www.schaeffler.co.uk

WEG launches flameproof motors

WEG is providing the highest levels of energy efficiency and protection in hazardous environments, following the launch of the W22X range of flameproof electric motors.

ATEX/IECEx certified, the W22X motors are designed to cope with the rigours of aggressive and explosive atmospheres, while delivering the added benefits of high efficiency, (IE2/IE3 energy efficiency rating), minimised noise, vibration, and low operating temperature for increased reliability and safety.

Available for low, medium or high voltage supplies, and with either Ex d or Ex d(e) flameproof protection, the W22X product range covers 2, 4, 6, and 8-pole motors in sizes up to 500 frame, across the power range from 160kW to 1500kW. The first units released in the motor series are frame sizes 500KH: 4-pole, 6kV motors with power ratings up to 1500kW.

www.weg.net

Servo drives save panel space

Lenze has launched its i700 servo drives intended for multi-axis machinery. These save panel space, reduce control complexity and purchase costs. The latest versions of the 3200C controller for motion, logic and visualisation demonstrate easy integration with the I/O system 1000. Lenze 'motion centric automation' extends this control solution through communications and software to the drives and gearboxes with servo, dc or standard ac motors.

Also is an extension to the range of 8400 motec decentralised drives. Two sizes extend the range from a starting point of 0.25kW up to 7.5kW, all with IP65 enclosure. The 8400 motec inverters are simple to install either onto the motor or a nearby wall and can be connected by looping through power cables.

www.lenze.co.uk

Programmable absolute encoders

Sick UK is launching a range of EtherNet/IP-compatible programmable absolute encoders, the first EtherNet-based fieldbus encoders in Sick's portfolio. The Ethernet/IP AFS60 single-turn and AFM60 multi-turn encoders offer unique diagnostic and monitoring capabilities for improved plant reliability and availability.

Designed for both precision applications and harsh industrial conditions, the Sick EtherNet/IP encoders are the first to integrate DLR (Device Level Ring) technology for continuous monitoring of network integrity. Network communications can be rebuilt seamlessly in the event of a cable break preventing downtime. Furthermore, the position of the break is reported, enabling remedial action to be taken quickly and efficiently at the next convenient opportunity.

The innovative round loop capability of the AFM60 EtherNet/IP multi-turn encoder aims to cut programming and hardware costs for machine builders.

www.sick.co.uk

Reduction gear improves efficiency

Centa Transmissions has released a large precision speed reduction gear. The compoent is bringing increased efficiency to medium and large scale robotic and automated manufacturing processes that require high speed-reduction ratios.

The Fine Cyclo F4CFS-UA 115 benefits from high positioning accuracy and is available in the UK from Sumitomo precision product specialist Centa Transmissions. It also has a very low propensity for error, even working under maximum dynamic alternating loads.

Its innovative design features use the Cyclo principal where specially contoured cycloid disc lobes enable the two-stage reduction gear to operate at very low vibration levels with optimal distribution of load forces. In the UA 115, the cycloid discs for the second stage gear are combined with four spur (involute) gears that operate as the first stage of a central toothed input shaft.

www.centa-uk.co.uk

Solution to last month's Coffee Time Challenge

The solutions to last month's Coffee Time Challenge about how to dry your house after it has been flooded comes from Middlesex based Direct Air Dryers (DAD).

The idea came from engineers, Jack and David Elliott, who reasoned that there had to be a better way of removing water and trapped moisture from water damaged properties. They came up with a device that can put air where it is needed, dramatically reducing overall drying time.

The system uses inflatable mats which have air blown through them. The mats can be placed on walls and floors, and can be made in all shapes and sizes, to target damp areas. The key to the design is to distribute precise amounts of turbulent air to the damp areas.

The DAD mats use a series of intricate air distribution channels and outlet vents to achieve the necessary effect. The air is evenly distributed within the mats by a system of webs and apertures to ensure even drying when the air exits through specially sized holes on the drying side. These holes ensure local turbulence is generated giving the greatest drying effect.

www.directairdryers.co.uk

A design **for lifecycle**

Depending on your company and sector you may know it as sustainable design, eco design, lifecycle design or system design. They all mean pretty much the same thing and it is a philosophy that is gathering pace and moving upstream from the detailed design stage to more conceptual design.

So what is it? The term 'sustainability' is increasingly finding its way as a heading on corporate websites and brochures. The term can be a bit misleading and is more of an ideology, at the moment at least, which incorporates reducing the environmental burden rather than being truly sustainable. The reality is engineers and designers have to be more efficient than ever and deliver better, faster and cheaper products that are now also greener.

Chris Sherwin, head of sustainability at product design consultancy Seymour Powell, says: "Last year I sat in on a meeting with the CEO of a seriously large global engineering firm. His business strategy and sustainability strategy are pretty much one in the same. This is a huge €15billion business that has enormous impact across things like the packaging supply chain. The changes that these guys make have ripple effects down through the supply chain."

While marketeers love the term sustainability many engineers are asking what it actually means and asking for it to be quantified. Really it is about taking a systems approach to design. And what that means is considering the through life impact and effects a product has from the so called cradle-to-grave or dust-to-dust, depending on what terminology you prefer.

Many companies already assess the cradle-to-grave of products carrying out a life cycle assessment (LCA). Essentially this is what sustainable design encompasses. LCA's are becoming increasingly used by businesses to ascertain just what all the hidden environmental impacts are, and highlight inefficiencies. However, LCA tends to come after a product has been designed and tested, and production is underway. It is estimated that about 80% of a products carbon emissions are locked in at the design phase. Yet the information about this only becomes available when a change is difficult and costly to implement.

"Doing it later is corrective," says Powell. "You have to go back and redesign a product that you got wrong in the first place. We should be moving this philosophy of systematic design out of the detailed design stages, out of this corrective based model, and into conceptual design."

While the natural assumption is that this is all about environmental impact, and to a degree it does all harp back to it, it is about efficiency. Having an efficient design that can be made efficiently in an efficient supply chain that can be easily reused or recycled ultimately saves money, and that has to be good for any product and organisation.

Design engineers have enormous power and opportunity here. Those early decisions lock in materials, which in turn locks in a supply chain, manufacturing processes, the way a facility is laid out, and the type of transportation needed. Design locks in environmental impact and embeds CO2. And it also locks in cost from production to materials to disposal.

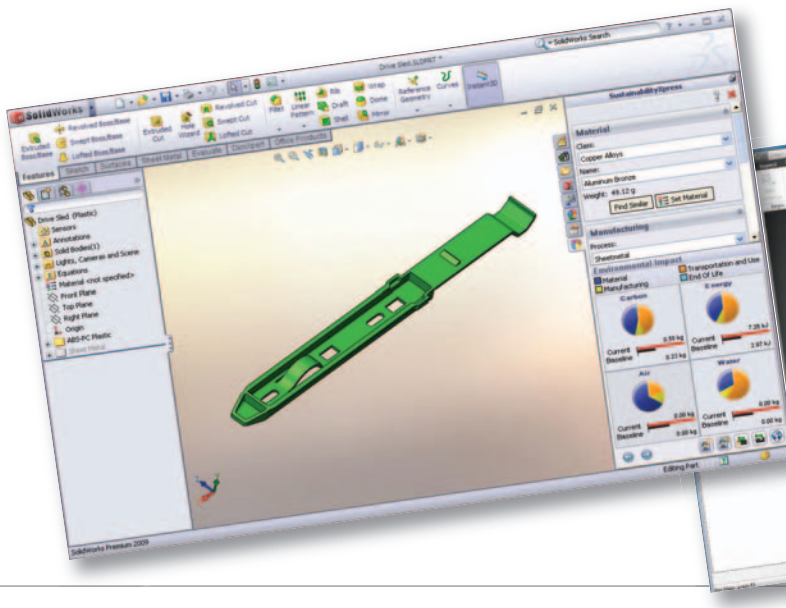
There is no doubt the motivation is there, however looking at products in this systematic way often throws up unforeseen impacts and seemingly counter intuitive results. What seems a 'no-brainer' turns out to have a dramatically negative impact.

Sarah Krasley, sustainable manufacturing manager at Autodesk, says: "It is a vexing issue for many engineers who are trying to do the right thing to improve the environmental footprint of their products. They might use different materials or design in a different way but when you look at it from a whole systems perspective it is not quite as good as hoped."

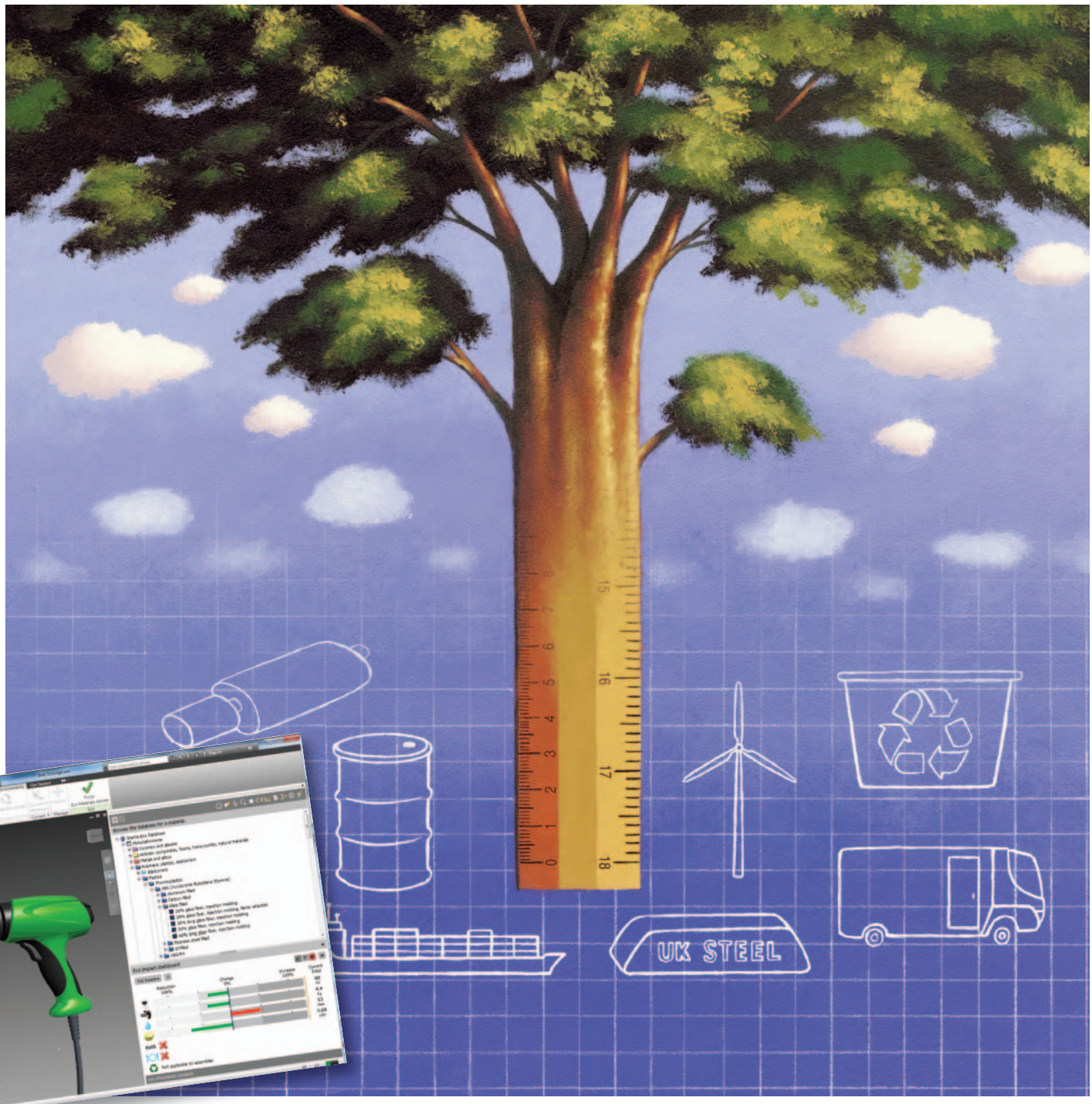
Examples of good intentions going wrong can be seen throughout industry. A high-profile example was NASA, which decided to replace a lead of solder with a tin solder. The change resulted in a satellite not performing as well. It had to be decommissioned and dealt with. The result was hundreds of thousands of dollars and tons waste.

Legislation is also not always the best guide, or driver, either and can lead to a very narrow view. While a one set of criteria might be achieved, it is often done at the expense of others. Examples of this can be seen in the automotive industry which is reducing fuel consumption as a result of targets set around tailpipe emissions measured in g/km of CO2. Many adverts now quote this figure.

As a result, hybrid motors and alternative materials are being sort. Aluminium is a popular choice for making car structures lighter but it is



Taking a holistic approach to design has always been desirable, but is often difficult to get right. Justin Cunningham talks to the experts about the tools available and why engineers and business need to take note.



much more energy intensive to refine from virgin ores compared to steel. And that is the problem. The impact of manufacture and disposal can significantly offset any reduced tailpipe emissions. As a result, last year the World Steel Association called for a shift in the target that is driving automotive design from tailpipe emission to a LCA approach to give a truer picture of a vehicles environmental impact.

Counting the cost

"Even if you are not looking at this from an altruistic perspective, from a cost perspective you have got to deal with this stuff," says Krasley. "If you don't have a proactive strategy for better finding materials that are not impactful from a resource perspective, your cost of doing business is just going to go up."

Many software vendors are partnering with material database companies to help bring this information forward. Autodesk has partnered with Granta Design to facilitate the use of a 'Materials Dashboard' to allow the comparison of a baseline with numerous others and see in graphical format the change in embedded energy, CO2, water and cost. This is about giving engineers information so they can experiment with different materials, simulate their performance and make their own tradeoffs earlier in the design process.

Sustainable design is much broader than having good processes and material selection. A product has impacts in a lot of different ways and these are usually described in five or six stages. The first is material extraction. That is the impact of the raw material being removed from the ground.

The next stage is material manufacturing. It might be the metal ingots and all the processing and machining; it could be epoxy resins and carbon fibres and the processes around those; or the refinement of oil and chemical mixing of a plastic compound.

Asheen Phansey, sustainability product manager at Solidworks, says: "All this happens before a designer even creates anything in the CAD department. If you extrude just a simple block of aluminium and you take that to production it has got that entire environmental burden associated with it already."

Solidworks has partnered with PE International to also offer a materials 'dashboard' that shows the embedded carbon, energy, air and water in separate pie charts that break down the embodiment in to material, transport and use, manufacturing, and end of life. This shows comparison with a baseline and allows users to run simulations with different materials to assesss if the mechanical properties are good enough. It also allows for regions of material production to be included, so Chinese steel might have used energy from coal fired power stations, which will be reflected on the dashboard.

"What we are trying to do is predictively estimate all of these impacts right in the design environment so the engineer can see the effect of a design decision," says Phansey. "For example, we want users to be able to realise that something might affect the end of life impact of a product and be able to change the design before it even gets to the manufacturing floor."

In short, sustainable design borrows heavily from lifecycle assessment and looks to bring the process forward right to the early stages of design. While this has always been desirable, it is only until recently that enabling tools such as those coming from Autodesk and Solidworks, have become more assessable and available.

These are not meant as replacement for full LCA which will still remain. What these are doing is allowing analysis at the frontend; to act almost as filters and guidance. Like early FEA in the design process, it is there to steer engineers, highlight what is working and what is not. It is about having information about all the hidden aspects that go in to creating, using and disposing of a product. Ultimately, it is about efficiency, being more profitable with less environmental impact.

Phansey concludes: "We want to provide engineers with a tool that makes these things intuitive, to sharpen peoples own sense of how to measure their impact and think about design holistically."

www.seymourpowell.com
www.autodesk.co.uk
www.solidworks.com

Tips for sustainable design

Sarah Krasley

The simple things people can do is that whole systems thinking in the beginning of the design process. We have developed a series of videos called the sustainability workshop. They get in to the sustainable design issues that you can't really cover while you are working in CAD.

There is a module on design for disassembly. That is a low hanging fruit opportunity for many companies. You can look at ways to reduce the different types of fasteners inside your assembly. Do you have the opportunity for pieces to snap together instead of having to be fastened.

Can a product be multi-generational? So could you make the guts of product and allow for a refurbishment. And in doing so, lengthen the relationship you are creating with your customer.

Asheen Phansey

One of the most common sustainable design strategies is lightweighting. We think the CAD phase is the right place to do it in tandem with FEA so you can remove material and do FEA to make sure you retain strength.

The second thing is choosing lower impact materials. If you use a certain plastic, look through the materials database to see if you can find another one that satisfies your design criteria but has a lower impact.

Another idea is manufacturing locally to minimise transportation. When you change to a region of manufacture in our software, its triggers the use of a different electrical grid to provide the energy for manufacture.

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Opening up

When BAE Systems is talking about 'open innovation', others listen. Paul Fanning finds out more.

Openness is not a concept most would normally associate with the defence industry, which is why it is a surprise to hear a senior figure at the UK's leading defence company to be hailing it as the key to ongoing commercial success.

That, however, is exactly what James Baker, managing director of BAE Systems' Advanced Technology Centre is doing by advocating what he terms 'open innovation', a philosophy that relies on greater collaboration between companies like his, SMEs and academia, using a greater preparedness, sharing technologies and expertise to arrive at a more efficient and cost-effective end result.

In advocating this, Baker is well aware that he is running contrary to many of the traditions of the defence industry. He says: "Defence used to be very much what I'd call a 'closed innovation model'. If the UK decided it wanted a fighter, it had to be UK, not American. So we'd have

to develop the intellectual property from scratch and then exploit it in programmes for products that only the UK would buy. The model was that the customer wanted it and we'd supply it to them and only to them."

However, this business model, says Baker, is "bust". A declining defence budget, a shrinking number of defence platforms allied with over-commitment to those existing platforms has forced companies such as BAE Systems to explore other avenues. "That closed model was based on defence leading the way and driven by a model that effectively funded research to keep the leading edge," he says. "Today, that model has changed. Our model is now about leveraging commercial technology – whether in the supply chain for automotive, telecomms or academia – and looking at how we can exploit that for the benefit of defence."

Baker offers a number of examples of how this has worked. One was on the Wildcat autonomous vehicle project where, rather than employ a highly sophisticated (and expensive) camera from the USA, BAE adapted a collision avoidance sensor from a Mercedes, 'rewrote' the electronics and, as he puts it, "the Wildcat suddenly had a collision avoidance sensor that was better than the one on the Mercedes because it was longer range, was fit for purpose and was done quickly. It can now recognise things like potholes, fences and – with that additional capability – it can go back into the supply chain and offer more capability for the automotive sector."

"I've got a problem and the solution is out there somewhere. I need to find a way of sharing that problem and creating the right partnership"
James Baker
Managing Director of BAE Systems' Advanced Technology Centre

Another example is a partnership between BAE and Visteon, the manufacturer of automotive components. Says Baker: "We really understand displays, high-end electronics and military-standard areas. They really understand, low-cost, high-volume manufacturing. We take that high-end challenge from defence and they help us to make it in large volumes for low costs."

Such partnerships, admits Baker, do have clear pitfalls. One of these lies in the question of IP, which, he accepts, has to be shared in such collaborations. However, as he puts it, "100% of nothing is nothing. If we have to share some of the IP to get the right solution, then so be it. There are many examples of fantastic intellectual property that's been developed in the past, but it's not been exploited and not reached the market. For me, the key is exploitation, not the actual ownership of the IP."

Another more immediate problem, he believes, lies in the difficulty of maintaining necessary levels of secrecy while also explaining the need for a solution to external partners. He offers an example, saying: "One of the biggest challenges at the moment is counter-IED technology. Naturally, the MoD is very reluctant to share with the public what its vulnerabilities are or what the threat looks like. The MoD wouldn't publish the weakness of the vehicles, but what we can do – as people that are trusted – is be told what the vulnerability is and go into the market and without sharing the problem, take a commercial technology and 'chip it'. Do something different with it that makes it more capable for the purpose we have in mind. So we get all the benefit of that investment, that leverage and low cost and can then licence or sell that back into the supply chain, which makes the product more capable for the market."

For all the apparently high-flown talk, Baker is keen to make clear that 'Open Innovation' boils down to something very simple, saying: "I've got a problem and the solution is out there somewhere. I need to find a way of sharing that problem, connecting to the supply chain and creating the right partnership, thus allowing us to do things much more quickly and effectively than if we do it purely ourselves. You just can't work in isolation anymore."

www.baesystems.com

• *See June's issue for a more detailed article on the work of BAE Systems' Advanced Technology Centre*

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Making things **happen**

Manufacturing is at the heart of the UK's economic recovery – but a clear vision, targeted investment and a shift in image are needed. This will be the focus of Answers for Industry, a major conference and exhibition hosted by Siemens this summer. Juergen Maier, Managing Director for Siemens Industry UK, outlines priorities

Juergen Maier, Managing Director of Siemens Industry UK

The economic challenges this country has faced over the last couple of years have demonstrated how an over-reliance on financial services, housing, construction and the public sector can have seriously damaging consequences. 'Making things' is definitely necessary for the nation's prosperity and to secure a more resilient, broader, economy.

Sadly, most people still perpetuate the myth that Britain does not make anything anymore – but they are wrong. The facts are that manufacturing contributes around 11% of the GDP and employs around 3 million people, producing 55% of all UK exports. Indeed, the UK is the ninth largest manufacturing country in the world by output, so manufacturing is certainly still extremely influential for the UK's economy.

The UK now has an opportunity to put high-tech, advanced manufacturing right back at the heart of British life, ensuring more jobs and growth from new and growing areas of industry. However, to allow us to do this, we need a focussed approach, the right kind of support from Government, and investment not only in human capital to tackle the engineering skills challenge, but also in R&D to remain competitive on the global stage.

Investment levels in UK manufacturing capital equipment have been, and according to forecasts look set to continue, well below the levels of 2008 despite the continued rise in manufacturing output. The challenge is starkly presented when we look at the comparisons of UK investment compared with that in Germany.

On comparable output levels, UK manufacturing investment in 2011 was a good 30% behind that of Germany. However, the Government is responding to this challenge by pledging more investment and a greater focus on R&D both for products and manufacturing related services, as well as around high-tech manufacturing related services and processes. The proposed innovation catapult centres provide a great example. However, we are in catch-up mode, particularly when compared again to Germany, where similar institutes have a combined budget 300 times that of the UK's.

With appropriate support and strategic vision, the UK can lead the world in aerospace, renewable energy, hi-tech engineering and low-carbon technologies, such as offshore wind turbines and electric cars. These are the kinds of advanced engineering projects that will not only help secure Britain's manufacturing future, but also provide the enticing and aspirational career paths we should be nurturing for the engineers of tomorrow.

But we also need a workforce that will deliver it. Of the 300,000 graduates emerging each year from our educational establishments, only 24,000 do so with engineering–related degrees. By comparison, China benefits from 600,000 engineering graduates per annum. Statistics also confirm the even more critical requirements for vast improvement in the rate and availability of vocational training. The engineering sector requires 235,000 people at apprentice and technician level over the coming decade and the pipeline is around 50% short in both numbers and quality.

Renewed focus on the importance of – and investment in – apprenticeships is to be applauded, but it's critical that this isn't just a brief moment in the spotlight. Investing in apprenticeships and training at all levels within the sector are key to the long term health and prosperity of manufacturing. It's also crucial that we give technical apprenticeships a much higher standing in society.

Currently, manufacturing is enjoying something of a renaissance and – as a company that employs more than 5,000 within UK manufacturing – we know this first hand. There is tangible backing from Government and significant support from other parts of the economy where the belief is that reinvigorating our manufacturing base will help to kick-start wider growth.

So, now is the time for action, and manufacturers must work together to ensure that manufacturing continues to strengthen its position as a key driver for growth in the UK economy.

I look forward to seeing you at Answers for Industry and hearing your views on the future for manufacturing. We're excited about working with you and very much look forward to engaging with you to help answer questions on the challenges that UK industry is facing.

SIEMENS

To book your free place at Answers for Industry on 4th and 5th July at Manchester Central Convention Complex, log on to www.siemens.co.uk/afi

Composites step up

Europe's biggest composites show, JEC 2012, was bound to offer plenty of interest to *Eureka*'s readers. It did not disappoint, as Justin Cunningham reports.

This year's JEC show revealed a host of innovation stemming from the materials world. It is fair to say there was quite a positive buzz, with many not feeling the same economic pinch that has ravaged other sectors. In fact, the economy was hardly mentioned with many exhibitors boasting full order books and talking about the growing confidence in the engineering and manufacturing sector.

The composite industry has busied itself since the recession concentrating on innovation and lifting the barriers to the mass markets. They are not quite there yet, and the material is still considered by many as premier. But they are not too far off and continue to move forward. Below is a roundup of the best news and innovations from this year's show.

The National Composites Centre in Bristol

Dassault and National Composites Centre to collaborate

The National Composites Centre is to collaborate with Dassault Systèmes for mutual development of composite design and simulation capability.

Dassault will provide NCC with its latest collaborative modelling and simulation environment based on V6 solutions. By working with the NCC, Dassault hopes to improve its composite modelling and simulation capability by closely working with the NCC's advanced composite experts. In turn the centre and its partners will benefit from the premium design and simulation capability of Dassault's software.

Peter Chivers, chief executive of the National Composites Centre, says: "Our mission in developing composite product manufacturing knowledge excellence will be greatly helped by Dassault Systèmes who will in return benefit from NCC's industry knowledge."

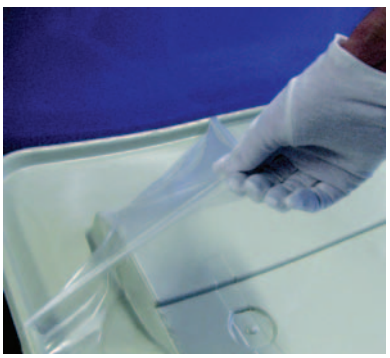
Dassault Systèmes has a longstanding leadership in providing composites solutions for innovation, addressing key challenges in industries such as aerospace, automotive, marine and energy. This is well placed with the NCC which has an impressive catalogue of experts on its books including representatives from Rolls-Royce, Airbus, Vestas, AgustaWestland, GKN, Umeco and the University of Bristol.

Philippe Laufer, Vice President of research and development of CATIA, Dassault Systèmes, says: "The NCC is critical to global composite industry developments, and is an ideal partner for us. Building strong partnerships with leading composite academic institutions, research centres, and industry clusters worldwide is a key focus for Dassault Systèmes to remain at the leading edge of technological innovation."

www.compositecenter.org
www.3ds.com

Chemical release agents to be replaced by film

The Fraunhofer Institute in Germany has developed a thin film which can



be used instead of a release agent in plastic and composite moulds.

FlexPLAS is an elastic polymer which features a flexible release layer that facilitates easy removal of components from moulds. The film can be applied using a special deep-drawing process without alteration of tool design and is suitable for both male and female moulds.

It has been used to manufacture large carbon fibre reinforced plastic (CFRP) components on a 1:1 scale via a prepreg process at 180°C in an autoclave which can be coated without further pre-treatment. This is because the use of the release film allows clean removal from the mould without the transfer of any residues. FlexPLAS can be used with prepreg and other manufacturing processes such as vacuum infusion or in wet lay-up.

The film allows for an in-mould coating to the component by applying a gel layer to the film. The matt effect of the coated surface can also be adjusted by the roughness of the FlexPLAS release film used.

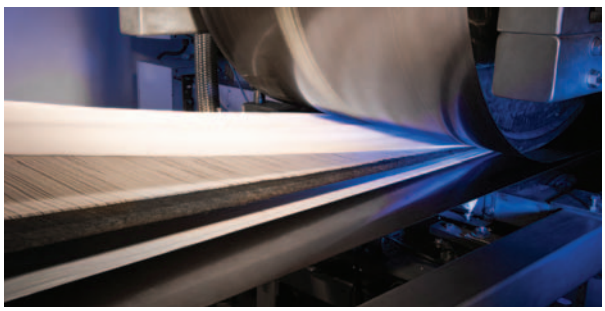
Notably, there is no downtime required to clean the moulds and free

them from release agent residues. Furthermore, if the film remains on the component to the end of the process or up to delivery then it also acts as a protective layer.
www.fraunhofer.de/en

Composite sheet production on continuous press

Press and steel belt manufacturer Sandvik demonstrated its double belt press technology at this year's show, which enables pressure, heating and cooling to be incorporated in one continuous, short cycle process.

The inherent strength and outstanding thermal properties of steel make it the ideal material for high pressure processing, while the belts flat and hard surfaces ensure a smooth finish to end products. The double belt can accurately control and adjust each aspect of process, and



has obvious benefits in terms of productivity.

Sandvik manufactures both isobaric and isochoric double belt presses. The isobaric applies a constant pressure and is ideal for the production of thin products and composites, including fibre-reinforced plastics, decorative laminates, floor boards and extruded board. The isochoric maintains a consistent press gap which is irrespective of pressure and is used for sheet casting, sheet moulding and laminating application.
www.sandvik.com

UV curing composite

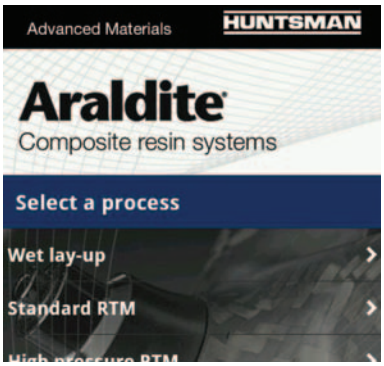
Gurit has developed composite technology that uses UV light from specially designed lamp equipment to

fully cure in just a few minutes. This has been developed in to its Renuvo multi-purpose system (MPS) to allow for in-service repair of wind turbine blades.

MPS can be used on its own for repairs, but only where laminates do not need to be replaced or added. Typical application would be to treat surface pitting and erosion, as well as small holes. Using a dedicated UV source, ideally its Renuvo Lamp Technology, Renuvo MPS is cured in just 90s for a typical spot filler repair up to 3mm thick. Used in combination with Renuvo Prepreg the MPS product acts as a primer to give a good air-free bonded surface.

It has been demonstrated as a practical solution to performing repairs quickly at different temperatures. For this reason, two specific grades of material have been formulated to give the right material in both hot and cold environments.
www.gurit.com

Mobile app for resin selection



Huntsman Advanced Materials launched a mobile app for Android and iPhone for selecting composite resin systems.

The app invites users to select the process being used from wet lay-up to standard RTM through to prepregs, filament winding and moulding. It then asks users to fill in some parameters from Glass Transition Temperature (Tg) to fracture toughness, pot life, gel time and mix viscosity.

This then takes the user to the results of resins found. Clicking on the individual resin shows a detailed material specification and the option of receiving a data sheet about the resin system. The apps will also be available on BlackBerry in May.
www.huntsman.com

Indian fibreglass company makes European acquisition

The Braj Binani Group announced it has completed its acquisition of 3B-The Fibre Glass Company. The deal was said to be worth €275million.

Braj Binani, chairmen of the Braj Binani Group, says: "3B is a great innovation and entrepreneurial company synonymous with reliability and quality. Its product range and geographic reach are highly complementary to ours and offer significant opportunities to deliver greater value to what will become our mutual customers."

The combined fibre glass production capacity is 170,000tons of which 150,000tons are in Europe and 20,000tons in Goa, India. The Binani Group said it is fully embracing 3B's existing strategy to focus on the key wind, thermoplastic and performance composite markets.

The Binani Group had a strategic ambition to partner with a European based fibre glass manufacturer with state of the art technology facilities to allow the Group to consolidate its fibreglass business.

Binani added: "We have ambitious objectives for the future which includes increasing our combined global capacity from 170,000tons today to more than 300,000tons in three to five years time."
www.3b-fibreglass.com

A train engine enclosure is lighter and less expensive in comsposite

Composite parts for diesel trains

Bayer Material Science has made a diesel train engine enclosure from composite materials.

Using its specially developed sandwich material, based on its Baypreg polyurethane spray system, the finished component is 35% lighter and 30% less expensive than a steel or aluminium counterpart. The parts are manufactured directly in their complex, three-dimensional shape using its spray and press process.

The railroad industry is increasingly thinking about weight reduction programs for diesel trains to reduce fuel consumption, costs and CO2 emissions. Despite the large part dimensions, the process provided excellent dimensional stability and control.

The enclosure is located beneath the train's passenger compartment just above the tracks so must be able to withstand rock impacts from below and be able to prevent oil from leaking onto the track bed.

The components are produced in a complex process using conventional epoxy or polyester resins. The sandwich structure is based on a honeycomb core covered on the top and bottom with glass fibre mats. It is sprayed from both sides with the Baypreg system, which contains the flame retardant and, optionally, cut glass fibres. The composite is then placed in a mould while it is still moist, and pressed at a temperature of 130°C. This causes the polyurethane system to react and foam slightly, binding the components firmly together.

www.materialscience.bayer.com

Ultra durable thermoplastic material

Ultra durable polyamide composite materials have been introduced by PlastiComp. It says its maximum toughness (MT) long fibre (LFT) polyamides have the equivalent strength to industry standard LFT polyamides yet have up to twice the impact resistance of the standard material.

Reinforced with long glass fibres up to 60% by weight, MT composites offer good injection moulding processing characteristics capable of producing complex geometries with thin wall sections. The materials are colourable and suitable for structural applications having aesthetic requirements. Commercial applications include performance sports goods, consumer durables, and heavy appliances.

Standard LFT and enhanced MT polyamides exhibit improved impact resistance with increasing fibre loading. LFTs also have excellent cold temperature impact resistance down to -50°C.

www.plasticomp.com

Toughening technology for weight savings

Aimed at the aerospace industry, Henkel's Hysol EA 9845 SF, is an epoxy-based composite surfacing film, which contains a non-woven fabric that is designed to improve the surface quality of honeycomb stiffened composite parts. The product reduces surface imperfections and minimises prepaint preparation.

Following an ongoing engineering trend toward lightweight construction, aircraft manufacturers can save up to 30% weight compared to previous systems with Hysol EA 9845 SF. Through its low weight, the surfacing film from Henkel minimises core crush and reduces core mark-through.

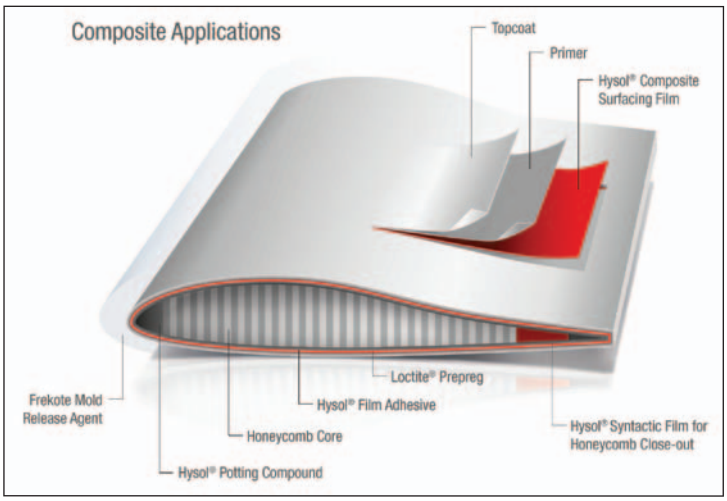
The increased resistance to UV radiation before painting eliminates the need for sanding and rework prior to painting. Even without sanding, Hysol EA 9845 SF guarantees good paint adhesion which increases the durability of the finished surface of the composite part.

The innovative Hysol EA 9845 SF can be applied to the fuselage, wings, engine cowlings, and control surfaces among others.

The company also demonstrated a number of other adhesives specifically developed for fibre-reinforcement applications including hybrid and electric vehicles.

www.henkel.com

Henkel's Hysol EA 9845 SF reduces imperfections and saves weight



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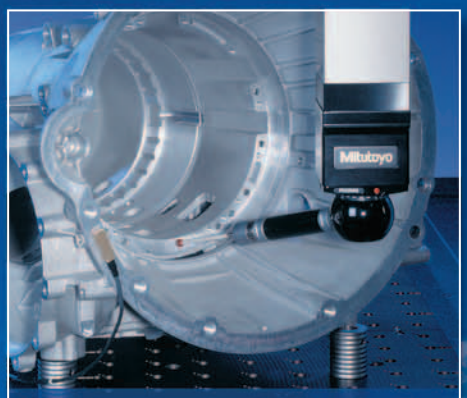
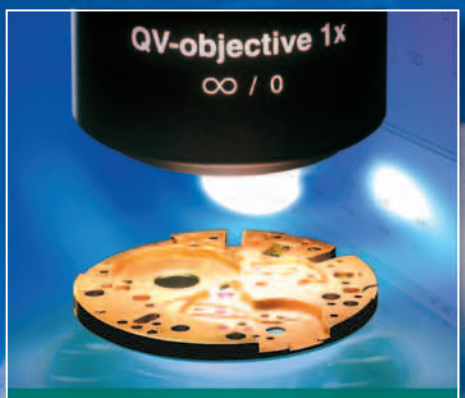


Coordinate Measuring Machines



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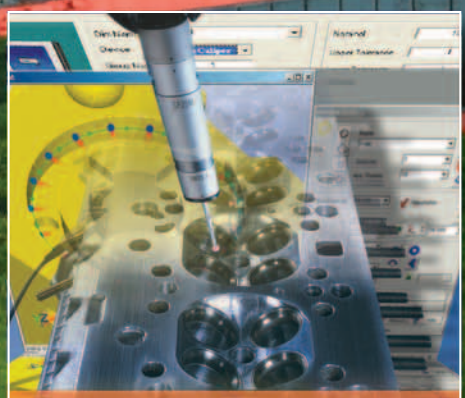

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Mitutoyo (UK) Ltd
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Sensing technology takes the lead

Paul Fanning takes a look at some of the latest sensors that were to be seen at the recent Drives & Controls Exhibition.

A number of novel developments in sensors, test and measurement were well represented at the recent Drives & Controls exhibition in Birmingham.

Among these were offerings from Leuze, including its ODSL 9 series of optical distance sensors. These sensors are offer a large measurement range from 50 to 650mm – with high accuracy at the same time. They offer resolutions starting at 0.1mm at a repeatability of 0.5% from the anticipated value. The measurement rate of 500Hz (in speed mode up to 700Hz) makes the ODSL 9 distance sensors the ideal solution for moving applications. This speed can also be used to filter measurement values as well as for static pre-processing. The devices operate largely independent of object characteristics, meaning they are insensitive to gloss, surface and bright ambient light.

Also from Leuze comes what the company claims is the world's smallest contrast sensor. The KRT 3B series distinguish between grayscale values, enabling them to detect minimal contrasts. As a result, a check can be performed for the presence of text, imprints or marks.

The KRT 3B's stablemate, the KRT 20B brings this performance and technology in a larger housing. The KRT 20B is manufactured in an extremely robust plastic housing using a special manufacturing process. Mounting points made of stainless steel ensure a secure connection. Four optical systems connect with an outlet on the front and upper-front face, each with lengthwise or horizontal orientation of the light spot to ensure flexibility in mounting. The KRT 20B is available in two power classes, standard and advanced, with switching frequencies of 6 and 10kHz.

Leuze's ODSL 9 series of optical distance sensors

Sick UK also showed a distance sensor, albeit a laser distance measurement sensor. The DL100 Hi is designed to achieve high levels of accuracy over greater distances for positioning and control in fast-moving environments.

With the DL100Hi, Sick has developed significantly improved control loop technology to achieve faster and more accurate position feedback. The sensors' data output supports applications with acceleration values up to 15m/s^2. As a result, for example, storage and retrieval systems can become more efficient - achieving shorter run times and more runs per hour.

The DL100Hi offers the choice of three measuring ranges to suit customers' applications (0.15 to 100mm, 0.15 to 200mm and 0.15 to 300mm) with a positional accuracy of ±2mm and repeatability of ±0.5mm.

The DL100 Hi is the first sensor to utilise a new modular platform for Sick distance sensors, offering flexibility and easy interchangeability within a common mechanical and electrical design. A wide variety of feedback interfaces are supported including SSI, RS422 and Profibus.

Outlining the benefits of this, Sick product specialist Darren Pratt said: "As a result of this improved performance, operators can achieve significant improvements in operating efficiency. At the same time, the sensors' robustness and reliability reduce the risk of downtime and offer

Renishaw's Resolute true absolute optical encoders

longer periods between replacement."

A fully fail-safe inductive sensor was launched by ifm electronic at the exhibition. The GG851S fail-safe inductive sensor simplifies some of the safety-related applications for such sensors.

A safe-state is given when the target is not present, i.e. outside the 10mm enable zone, in the area known as the safe switch-off zone. If a metal object is in the enable zone, the outputs are switched on. It also has a wider operating voltage than earlier versions, allowing operation down to 12V DC.

The operating principle can be illustrated using the example of a gantry crane.

With a normally open version, when the fail-safe sensor monitors the position of the crane on the gantry the sensor would need to be damped along the whole travel in order to maintain the safe function with the sensor only undamped at the stop positions.

This new version allows mounting of only one target each at the beginning and the end of the crane track, which saves material and mounting cost.

The GG851S sensor has two OSSD outputs for connection to a safety relay or PLC. The diagnosis of the different operating states is made using LEDs. No special target is required and the GG851S is fully flush-mountable. The fail-safe sensor is certified to ISO 13849-1 PL d, IEC 61508 SIL 2 and IEC 62061 SIL cl2.

Renishaw was displaying its Resolute true absolute optical encoder, which is capable of 27-bit resolution at 36,000rpm. With high accuracy scales, outstanding motion control, excellent dirt immunity and wide set-up tolerances, Resolute is claimed to outperform other non-contact absolute encoders. The fine-pitch system delivers a market-leading resolution of just 1nm at up to 100m/s, for both linear and angle encoding applications. It is available with a range of high-speed serial communications protocols.

Also on show was the Resolute ETR (Extended Temperature Range) encoder that brings all the benefits of the Resolute range including fine pitch angle encoder to harsh, low-temperature applications. With operation guaranteed down to -40°C in non-condensing environments, Resolute ETR is perfectly suited for use in demanding applications such as telescopes, scientific research, military equipment or aerospace platforms.

For embedded motion control applications, Renishaw's RoLin offers a component level non-contact magnetic encoder. The system consists of a readhead and magnetic scale or ring, with electronics inside the readhead allowing high interpolation factors up to 13-bits and integrated fault monitoring. A wide range of resolutions is available from 0.244µm to 125µm, with speeds up to 40m/s (dependent on chosen resolution). Radial or axial reading of the ring is possible. This product is intended for high-volume applications in sectors where miniature axes are required.

Additionally Renishaw's TONiC incremental optical encoders with a range of metal scales are claimed to provide the performance of fine-pitch glass scales, but in a simple-to-install package.

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Seeing into the future

***Eureka* asks three CAD companies about their views on 2012's releases and what they see as future trends and emerging technologies. Justin Cunningham reports.**

It is that time of year when new releases from CAD vendors hit the market and these are interesting times. Many are talking paradigm shifts, future trends, and the new and unique capability on offer to move design and engineering forward.

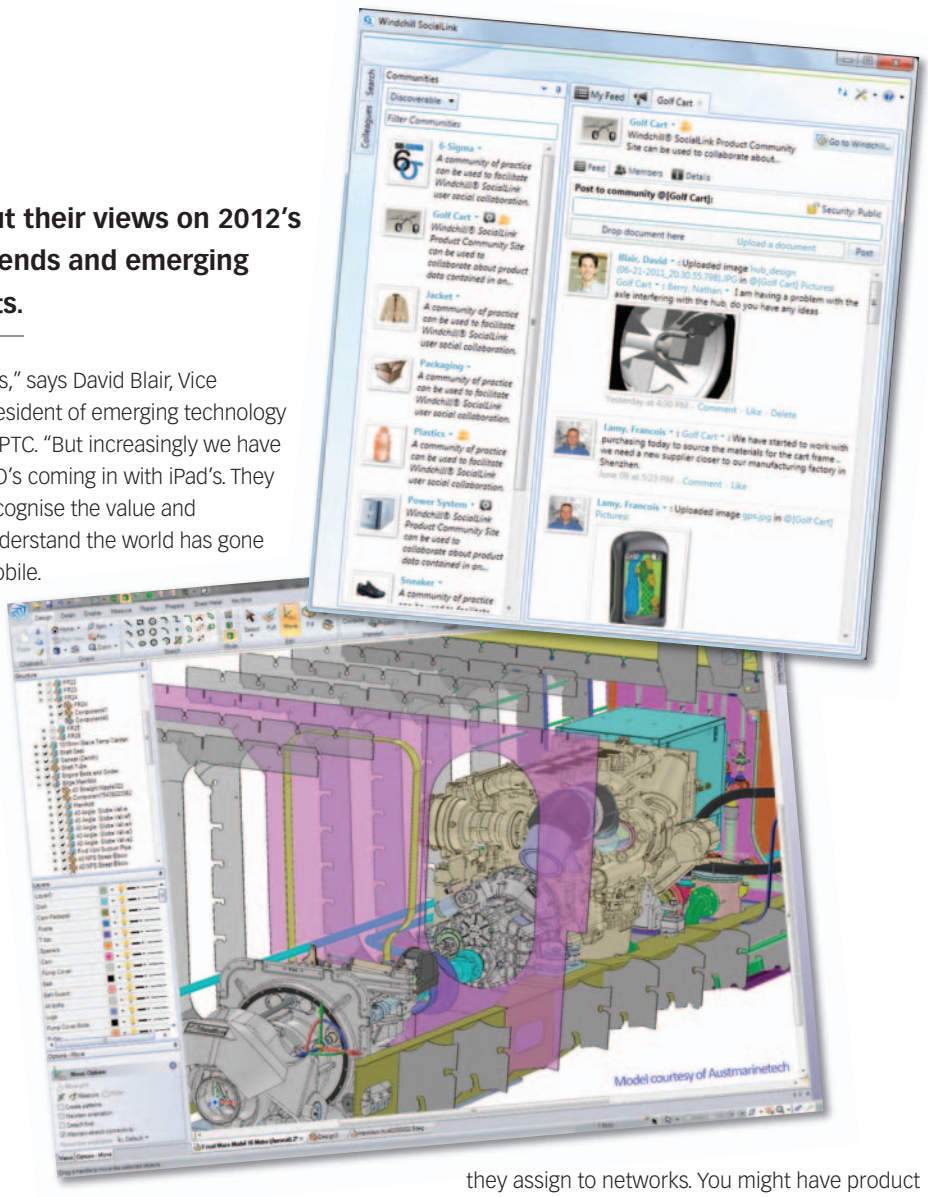
What is interesting is that there doesn't seem to be much commonality between the vendors and many of them are embracing radically different philosophies in their approach, resulting in some really new and unique offerings.

The explosion of mobile markets and social networks is something PTC wants to capitalise on. It has recently launched Windchill mobile available from the Apple App store, with plans to soon make it available on Android and Windows mobile.

Taking on another trend, the rise of social media, the company is keen to introduce Facebook and Forum-esque style features and functionality to its PLM system which it's calling SocialLink. It has already introduced this in Windchill and hopes to cement the idea, and practice, in Creo later this year.

The use of social media for commercial purposes is something that is definitely increasing and many companies are trying to embrace it. Chances are if you are over 50, you think it is a waste of time. If you are under 30 you can't imagine working without it. And those of us in between are very much that, somewhere in the middle trying to make it work. The philosophy of improved web functionality broadly comes under what is being dubbed web 2.0, and the leveraging of social media in the workplace is, in turn, being called enterprise 2.0. PTC believes a paradigm shift is upon us where we are moving away from email and in to social networks.

"In general, industry has been hesitant about this," says David Blair, Vice President of emerging technology at PTC. "But increasingly we have CIO's coming in with iPad's. They recognise the value and understand the world has gone mobile.



"The future of product design needs to better leverage the people in companies. Rather than ask the person next to you, imagine if you could reach out to people across the company. While email is great, you have to know who to send it to."

Many SocialLink features have Twitter style functions so you can target a specific user using the @ sign (@eureka), parts can be 'hashtagged' so they are grouped topics (#designsoftware), and people can choose to follow specific projects and people and get notifications around these.

The idea is that users have profiles which they assign to networks. You might have product specific ones, and technology specific ones like plastics. But the system is also intelligent and will store previous projects that are all searchable, so people can see if anyone else has designed something similar, seen previous problems and contact those individuals if necessary.

"People can share ideas, ask questions and problem solve," says Blair. "The product manager can write a blog rather than send out a weekly email to say how the project is doing, communities around plastics can share best practices, or if you are stuck use it as a online digital suggestion box."

The value is that if you have a problem involving a plastic mould for example, you can post it, and everyone in your company who has plastic expertise or follows the plastic network can see it and offer help. It could be an engineer in another country that you would never have known about that can help. It could be the manufacturing plant that designers never usually here from that can offer advice on what would be best in terms of manufacturability.

PTC wants to make it very easy to use Winchill and Creo as an enterprise 2.0 system and has very much embedded its functionality within these systems. It will be one button to post, follow or comment. Of course, security and sensitivity of who can see what, can be – and should be – managed and would need to be put in place. How much this will add to productivity and how much this will act as a medium for procrastination remains to be seen. But the fact is, enterprise 2.0 type systems are likely to become much more embedded in working practices in the future.

But, this philosophy of interconnectivity by PTC's PLM system is not shared by relative newcomers to the CAD industry, Space Claim. It has recently launched Space Claim 2012, its ninth release since the company was launched five years ago.

Space Claim wants to offer a CAD system that keeps its functionality while being easy to use. It says that out of the 25million mechanical engineers on the planet, only 1million are actually CAD users. It sees that as an enormous untapped market with big potential for its product.

Peter Kelly, sales director of Northern Europe at Space Claim, says: "Everyone is bringing products to market that are easier to use, but we are still a factor of 10 or 20 times easier. When you talk about 3D geometry along the engineering process you have got a draughting team and you have got other engineers that need to be involved but sometimes struggle to really get on with the really complex systems. That is our general fit."

Space Claim philosophy is to remove as much 'bureaucracy' as possible from the design process and keep its software simple, easy to use and highly interoperable with other CAD systems. It wants to give engineers tools that ensure they spend most of their time designing and the least amount of time inputting geometry.

But its software is still capable of performing complex engineering tasks. It uses direct modelling which is intuitive, allowing non-specialist users to simply click on objects to move them, pull them, make bigger or smaller, and has many normal Window-style functions such as undo.

Blake Courter co-founded of Space Claim says: "It seems like a really simple idea but it is not the way that CAD has worked. It is a very hard problem to solve but we have solved it in a number of ways. We are interoperable with everybody. But that is more than just geometry; it levels the playing field as everyone can work with everyone else's data."

In simulations, for example, Courter says Space Claim is being used as a preparation tool for setting up the simulation and getting geometry ready for meshing. "A lot of simulation users have to start from scratch as they can't reuse the CAD data," he says. "When they hear from Space Claim that they can actually reuse the CAD data it saves them a lot of time."

Autodesk has also recently launched software in the form of its cloud based PLM system, Autodesk PLM 360. The company has taken a u-turn, previously vowing never to enter the PLM market.

A frequent criticism of PLM is that the bureaucracy of it all can lead to diminishing returns, with people getting lost in box ticking exercises, data entry and performance analysis. The fact that so much data needs to be managed can detract from the original point of it all; problem solving, designing and adding value.

But Steven Bodner, VP of product development for Autodesk PLM 360, disagrees. He says: "Talk to the compliance manager or the VP of quality or someone in finance who is in charge of supplier management. It is a very different story and we hear that these systems become much more enabling."

Autodesk say the fact it has never done PLM before is one of its greatest assets. It doesn't have any heritage, or baggage, to carry around. It can take a fresh approach. Autodesk defines its PLM system in broad terms and includes business applications, project management, requirements management, quality management, compliance, field service and warranty to name a few.

"We found in many cases people implement a PLM system but all they really use it for is PDM," says Bodnar. "They could get all kinds of value out of adopting our PLM solution while using another system for its PDM activities."

While PTC is looking in to possibilities of cloud based systems, it is not making the leap just yet. And the same should be said from a social media point of view for Autodesk. While it has carried out a project called project Blue Streak which allows users to comment on designs and easier online collaborate, it is not committing just yet.

"We have the idea of social screens in our PLM product," says Bodnar, "though we have not turned on the switch to that part yet. We don't want to try and force yet another social system on people. I already use at least six. Do I really want another one? We'll let users plug in which ever one they want instead of forcing ours specifically on them."

www.ptc.co.uk
www.spaceclaim.com
www.autodesk.com

Recovering energy

An innovative air turbine is being used to capture industrial waste gases and turning it into electricity. Justin Cunningham reports.

Turbines are an extremely efficient and reliable way of extracting energy from airflows and converting it into something useful. The airflow requirement of an air turbine motor is a third less compared to a pneumatic vane motor and as a result, German based air motors innovator, Deprag, has developed an air turbine to capture industrial waste gases to create electricity.

Air motors are ideal for this application as they are incredibly robust and have excellent power density. Dubbed the Green Energy Turbine (GET), the device uses two stages to maximise the amount of energy recovered from the waste gases. The turbine and electrical generator are a compact unit and share a single driveshaft.

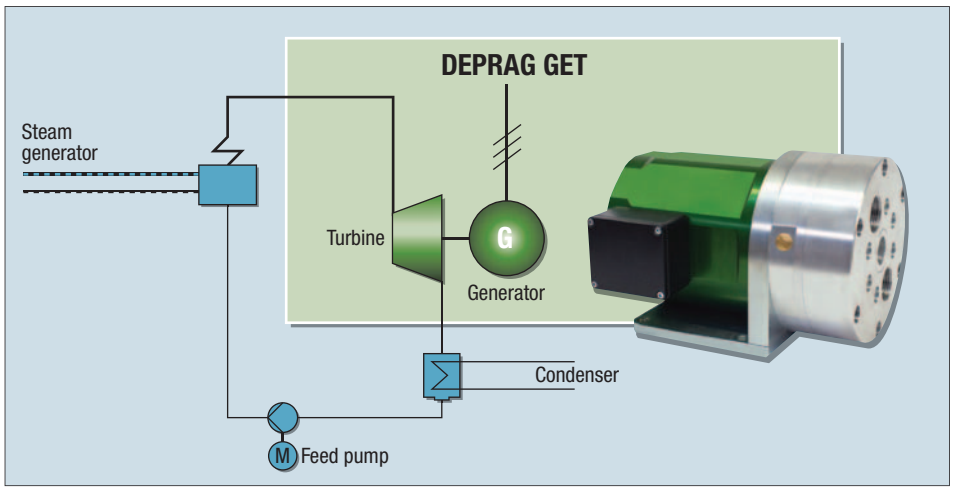
As gas flows into the turbine, it passes through a series of nozzles to accelerate the flow. This high pressure then turns the turbine blades, which are connected to the shaft. This, in turn, drives a generator at the same speed to produce electricity.

Chief operating officer of Deprag, Dr. Rolf Pfeiffer, says: "In many industrial procedures, unused process gas escapes into the atmosphere. Our basic idea was to tap these gases to generate energy.

"In a small, local energy recovery plant our progressive turbine generator can convert even tiny amounts of residual gas into electric power."

During development it was decided that the use of gears was to be avoided due to cost and maintenance. But this proved to be a major challenge for the developers. The physical characteristics and the small diameter of the turbine rotors resulted in a relatively high rotational speed for the turbine, and therefore the generator.

This set clear limitations in terms of material properties. As no standard generator was small enough or constructed from suitable material to withstand the continual loads at the calculated rotational speed of around 40,000rpm, it meant Deprag developed the electric generator itself from scratch.



The result is a compact unit consisting of a turbine and a generator that is not much bigger than a shoe box, so can easily be located and implemented for what the company call an instant 'plug and earn'.

The company has identified a number of potential applications including the cooling process in smelting plants.

Melting tanks are normally cooled by compressed air which flows through cooling channels to absorb heat. Normally, the compressed air is then released into the atmosphere, but with the GET turbine generator, the compressed air can be reused profitably.

Another example is where natural gas is pumped thousands of kilometres at high pressure from producing countries to the consumer. In order to feed it into the regional networks, which operate at a lower pressure, the pipe-pressure must be reduced and the gas decompressed. The utility companies reduce the gas pressure once again before it reaches private homes. In the transformation of pressures in the gas pipelines, energy is lost in gas distribution technology which could, in the view of Deprag engineers, be converted to electrical energy without major effort using the turbine generator.

The ecological benefits of this sort of energy recovery also pay off financially and the company say the investment costs should also remain affordable. Dr Pfeiffer concludes: "It is certainly imaginable that in the future we will be able to offer the turbine generator unit for 10kW for less than €10,000 at a corresponding volume."

www.deprag.com

The three-chain arrangement means a reduction from a 3600rpm motor speed to normal pedalling speed.

Chain drives new electric bike

The use of precision chains has been essential in the development of a hybrid bicycle. Justin Cunningham reports.

Hybrid bicycles are finding increasing popularity for consumers. As well as providing comical moments in the form of the struggling cyclists being passed by another cyclist apparently doing no work, the electrification of bicycles is gathering momentum.

At the centre of a recently developed hybrid bike electric drive system is a precision chain, which allowed a unique transmission system dubbed the direct dual drive (DDD). This layout sees the pedal crank and adjacent motor shaft connected with a three chain arrangements yielding a reduction ratio of 1:38.

The joint development project was undertaken by power transmission experts, Iwis, in conjunction with hybrid bike start up, Clean Mobile. The design specifications for the drive system included an exceptionally small but powerful electric motor running at high speed. To maintain optimum efficiency the motor was required to run at high speed, even at slow riding speeds. Additionally, the motor needed to be mounted near the pedals and power transmitted to the rear wheel.

It quickly became clear that this goal could not be achieved with conventional reduction gearing so Iwis technicians and Clean Mobile decided to split the gearing into a primary and a secondary transmission. They also decided that the primary reduction gearing should take care of the speed reduction to the pedal crank, and allow standard components to be used for secondary power transmission.

The combination of this three-chain arrangement means a reduction from a 3600rpm motor speed to normal pedalling speed. A freewheel hub ensures that the pedal force exerted by the rider is transmitted only to the wheel and through the drive system should the battery ever fail. A second idle arrangement disengages the pedals from the rear wheel, as on a conventional bicycle.

The innovative drive concept provides effortless acceleration without emissions or noise as well as yielding an excellent range both in town, and off-road. To the surprise of project partners, tests by the department of drive control and actuator technology at the University of the German Armed Forces in Neubiberg near Munich reported an exceptional efficiency of around 80% across a broad operating range.

A major contribution to the drives overall efficiency is made by the chains, through which the tensile forces are transmitted only in the direction of travel. A spur wheel with helical gearing, used for noise reduction, would induce additional, lateral forces and thereby reduce overall efficiency. The effect of the teeth of each sprocket on each chain, and the resulting overall transmission ratio were calculated in several stages, resulting in suitable chains with the required fatigue strength.

Following their successful cooperation, Iwis and Clean Mobile formed a strategic alliance in 2011, covering mainly industrial parts production and assembly for the DDD system. The company initially introduced the technology last year and continue to develop it toward mass-production.

Michael Frank, project manager at Iwis, says: "This is an ideal basis for future projects. We are developing both more powerful units and detuned versions that use plastic parts. Customer enquiries from the two, three and four wheel industries are showing a keen interest in the new drives."

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Taking place at the NEC Birmingham from 23-24 May, Medtec 2012 will be a showcase for the latest innovation in the medical engineering and technology sector.

The UK medical market continues to post impressive growth figures of 9.5% pa with the emphasis being on the next generation of high-technology medical devices not only being designed here but also manufactured in the UK. Set to lead the way globally in innovation and creation, the UK medical market continues to be a key area for British manufacturing to focus on and develop. Even the UK Government has locked onto the medical manufacturing market, offering grants and support for companies looking to get involved.

As we all get better quality of life and live a little longer, the requirements of the medical market are ever increasing, with innovation driving the way in ensuring that healthcare is delivered quickly, effectively and cost efficiently. The ever-increasing market is key to the UK economy, with many companies seeing this as their main driver for sales and profitability. There is still a chance to get involved in this great business and add value and security to your company's future, by participating in Medtec UK 2012.

Staged at the Birmingham NEC on 23-24 May 2012, exhibitors at this annual showcase for the UK medical device manufacturing industry will complement the renowned Medtec Conference education and Innovation platform with targeted displays within several special feature areas.

This year, the Focus on Key Technologies at these Pavilions Within Medtec UK will include:

Automation, Assembly and Robotics – a showcase of the integrators and latest technology for automated production and assembly techniques.

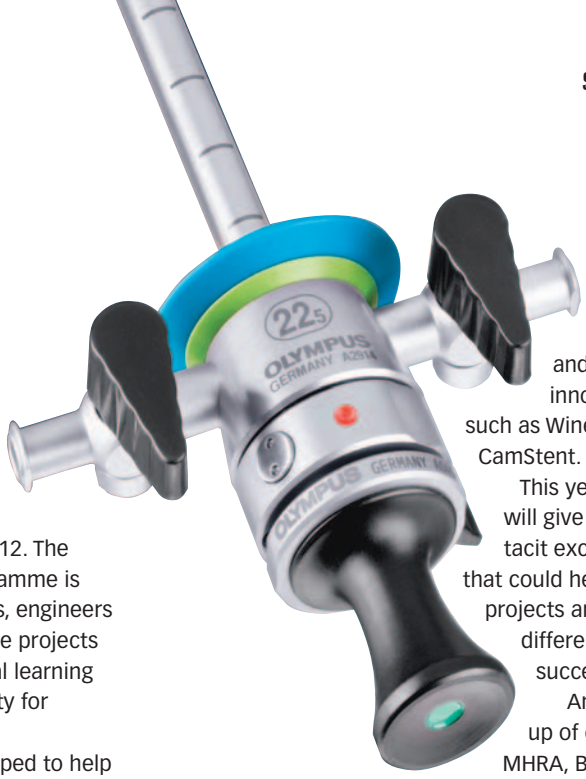
Medical Packaging – Materials, outsourcers and machinery for the packaging of medical devices and manufacture of pharmaceutical drug delivery systems.

PrecisionTec – Multi-Axis CNC technology, micro-machining, lasers and ultrasonic technology for the manufacture of surgical devices, implants and interventional cardio devices from specialty medical alloys.

Medical Plastics Technology – High-performance plastics, injection moulding and extrusion techniques for medical manufacturing.

Medtec UK will also have opportunities on the show floor to learn about developments in medical device manufacturing, in addition to its industry acclaimed Conference

A HandyStar hand-held ultrasonic welding unit will also be available to illustrate the principles of ultrasonics



Trumpf's lightweight TruMark Station 1000

Programme. A complete programme of topics and speakers will be posted on its website as details are confirmed.

Alongside the exhibition will be the Medtec UK Conference 2012. The two-day conference programme is designed to help designers, engineers and manufacturers manage projects successfully and is an ideal learning and networking opportunity for product developers.

Researched and developed to help tackle the trickier grey areas of project management and teamwork within medical device design, the Medtec Conference offers expert knowledge from global OEMs such as Abbott Vascular, Biomet, Boston Scientific and Medtronic.

Attendees will also hear practical tips and do's and don'ts from innovative start-ups such as Wines Medical and CamStent.

This year's conference will give you a unique tacit exchange of advice that could help accelerate projects and make the difference between success and failure.

An exclusive line-up of experts including MHRA, BSi and Philips Healthcare will dissect and divulge the very latest advice on the revision of the medical device directive.

Ultimately OEMs big or small set out to create profitable new products. But with so much regulatory uncertainty, global competition for quicker, leaner, cheaper products; and a tighter clamp on investment, this is becoming increasingly difficult.

This conference aims to understand the challenges surrounding R&D, design and regulation to help you take a fresh look at your own projects. Packed full of powerhouse case studies, innovative start-ups and industry guru discussion.

Those in the industry will be well aware about the constant threat of the regulatory upheaval; this conference has pulled together some of the very experts involved in the development of the directives to provide a dream team of expertise into a concise briefing to help you make sense and give you the very latest and best advice there is on the planned changes for CE Marking to help adapt your project effectively.

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Attendees will discover how regulatory and healthcare reforms will affect device development in the future, as well as learning how to define development process guidelines and cost estimations to workout optimal timing of investment, partnerships, and exits.

The conference will also help those attending to understand the NPI (new product initiation) process stages and key milestones before product release, as well as gaining a thorough understanding of critical quality, regulatory, and clinical trial considerations. Critically, the conference will also identify what every product development professional should know about the patent system and evidence portfolios.

First hand advice will be available, with expert input on design planning; capturing user requirements; human factors; and transferring user requirements to design specification. This will be augmented by case studies of successful surgeon and industry partnerships for effective design innovation and advice on how and when to work with manufacturers.

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***Eureka* has partnered with leading intellectual property law firm D Young & Co LLP to offer advice and information to help companies understand, use and protect their IP. Specialising in patents, trade marks, designs and related intellectual property rights, D Young & Co works with companies ranging from start-ups to established multi-nationals. In this issue, we look at the ramifications of the recently-announced 'Patent Box' initiative.**

What is the Patent Box?

In the 21 March 2012 budget, the Chancellor confirmed a commitment to a UK 'Patent Box' with the aim of encouraging innovation. The next day the pharmaceutical giant GlaxoSmithKline announced a £500m investment in the UK, with its CEO saying: "The introduction of the Patent Box has transformed the way in which we view the UK as a location for new investments." So what is this Patent Box, and why should it be so important?

A Reduced Tax Rate

The Patent Box is an opt-in scheme for obtaining a reduced rate of UK corporation tax on certain IP-based profits. The scheme starts in April 2013 and over several years will phase in a reduced rate of corporation tax of just 10%, compared to the normal rate of 23%. Relevant IP income can be from a number of different sources, including:

- worldwide sales of a patented item or a product incorporating the patented item;
- worldwide fees and royalties from licences granted to third parties to make, sell or use the patented item, or to use a patented process;
- damages awarded for infringement of patent rights.

It is important to note that just a UK or European patent will therefore make the income from worldwide sales eligible for the scheme, even if you do not hold a patent in the country of sale. Similarly worldwide income from licences is also eligible, but in this case of course you may need a patent in a particular country in order to licence it there. There are also a number of other sources of eligible income, including some related to using a patented invention in a way that still generates company profits, but not directly though sales or licencing. The calculation of the patent-based profit on these incomes then uses a refreshingly straightforward three-step process to arrive at the profit eligible for the reduced tax rate.

Example:
A chip manufacturer develops and patents a processor that uses 1% less energy than his competitor's, and sells it for £100. He also makes PCs using the new chip, which he sells for £1000. Under the patent box scheme, a proportion of the profits from sales of both the chip itself and the PC incorporating it are eligible for a reduced tax rate of just 10%.

Who Can Benefit?

The Government's aim is to 'create a competitive tax environment for companies to develop and exploit patents in the UK and maintain the UK's position as a world leader in patented technologies'. A company can qualify for the Patent Box if it owns or takes an exclusive licence for a UK or European patent, provided that the company actually made a significant contribution to the creation or development of the invention claimed in the patent, or to a product incorporating this invention. So what is a 'significant contribution'? For the development of a product incorporating an invention, it may well be the development of the technical knowhow that gets a prototype to commercial viability – but the simplest way to 'significantly contribute' is to be the applicant for the patent in the first place.

Patent Box Patents

The Patent Box statute rules out the frivolous use of patents to access the reduced tax rate. For example, incorporating a patented microchip into a loudspeaker for no functionally valid purpose in order to claim profits from the speaker sales would be exempt.

However, by contrast if one were to validly obtain a patent for a feature of the loudspeaker itself, then those sales would become eligible. Moreover, sales of a stereo system incorporating that loudspeaker would be eligible too. At this point it is important to realise that an invention does not need to be earth shattering to have technical merit or to be of commercial value, either in terms of being able to charge a premium, or gaining (or retaining) market share, or simply making a product slightly lighter, faster or cheaper. Consequently most products or processes have a patentable aspect to them if one focusses on the specifics. Such specific patents are often narrow in scope and not necessarily suitable for licensing or for foxing the competition, but have the advantages that they tend to get granted more quickly by the patent authorities, they provide some protection for a characteristic feature of your actual product, and, now, that they make income from your product eligible for the Patent Box tax rate of 10%.

Summary

The Patent Box scheme presents a possible significant financial benefit to companies of all sizes. Companies are well advised to review their R&D and products to determine if one or more patents could allow them to benefit from the substantial tax reduction on offer.

More information is available at D Young & Co's Knowledgebank at www.dyoung.com. Alternatively, please contact Doug Ealey at dre@dyoung.com or Anthony Albutt at aja@dyoung.com

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Cutting the cord

Can medical implants be powered from an external source?

While implantable electronic devices such as pacemakers and drug delivery systems have come on in leaps and bounds in the past 50 years, there is still considerable room for improvement.

Implanted into the chest area, the pacemaker is a small metal box weighing between 20 and 50g which sends electrical pulses to the heart to keep it beating regularly. The device usually lasts about eight years depending on how advanced it is and has been deployed in millions of patients worldwide.

While effective, the technology is reliant on battery power alone, which means invasive surgery is required when the battery runs out. Other potential sources of power including inductive systems, but even these have their downsides. As well as exhibiting differences in efficiency based on location, position and movement, they are often limited in how long each charge lasts.

In the future, it is envisaged that miniaturised, intelligent systems will take over therapeutic and diagnostic functions, while future implantable sensors are expected to be able to measure things like glucose levels, blood pressure and even the oxygen saturation of tumour tissue.

Devices that can effectively administer drugs and even counteract side effects in the process could also be on the cards, but only if a long term, reliable power source can be found.

The Challenge

The challenge this month, then, is to come up with an improved power transfer system for medical devices inside the human body that is small, cost effective and has no harmful side effects.

The technology should be able to remotely supply power to implants, medication dosing systems and other medical applications without touching them. Ideally the device should have a large range and be traceable at any time with respect to its position and location.

The system should also be unobtrusive, able to transmit power through an array of different materials and not require any special gels or adhesives.

The patented solution takes advantage of recent breakthroughs in wireless technology and even has applications outside of the medical field. It is currently being used to stimulate the growth of cartilage and bone cells in a hip implant.

We will publish the solution in the next issue of *Eureka*. In the mean time, see if you can come up with something better.

The solution to last month's Coffee Time Challenge of how to dry a building after flooding is in the Technology Briefs section on page 13

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E-T-A introduces new 'type 2' automatically reset circuit breaker for MINI blade fuse replacement

SAE J553 compliant circuit breaker remains open after tripping as long as power is applied

E-T-A Circuit Breakers, quality designer and manufacturer of a broad range of electro-mechanical and electronic products for circuit protection, has introduced a modified automatically reset thermally-activated circuit breaker, a 'type 2' version holding 100% rated current continuously in accordance with SAE J553. Acting as a MINI blade fuse replacement in MINI-sized terminal blocks, the E-T-A 1620-2 will remain open after tripping in the event of overload or short circuit as long as power is applied to the terminals: only upon switching off the ignition or the load in question will the breaker be reset automatically. It offers increased reliability and safety in passenger cars, commercial vehicles, watercraft and other specialised vehicles.

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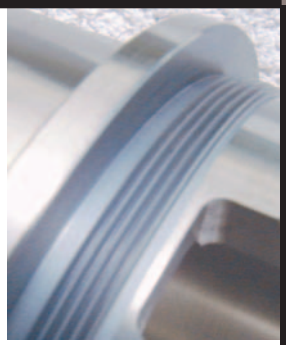
WS2 Stops galling of SS and Titanium



Stainless Steels and Titanium are both prone to galling and seizing. WS2 is a very low friction dry lubricant surface treatment, developed by NASA for use in deep space. It has been shown to provide a very cost effective solution, preventing both problems on threads and other sliding surfaces.

WS2 works well from -273° to 450° C and down to 10-14 Torr. WS2 has been applied to bearings and gears to extend life.

Design Out maintenance problems with WS2!

@: **sales@ws2.co.uk**
✆: **01430 861222**

Cutting Fluids

www.loctitesolutions.com

Environmentally responsible coolant

The Multan water-miscible, bactericide-free cutting fluids from HENKEL are formulated to be kind to the environment and operators without compromising machine performance. A typical example is Multan 71-2 a universal fluid that is able to undertake all machining and grinding tasks thanks to its high lubricity. It introduces new technology that prevents bacteria absorbing nutrients from the degradation of emulsifiers.

For high-alloy steel and aluminium machining, the special purpose Multan 77-4 provides super high lubricity even at low concentration; the product is especially suited to centreless grinding.

@: **technicalservice.loctite@henkel.com**
✆: **01442 278100**

Pressure Scanners

www.chell.co.uk

microDAQ helps corroborate Wind Tunnel Data for F1 Race Teams

Chell's microDAQ is a rugged clam-shell enclosure for PSI's ESP Miniature Pressure Scanners enabling identical pressure data acquisition devices to be used on-vehicle. Initial applications have been by F1 teams striving to acquire data under track conditions during testing and practice sessions but the system is also ideal for many other real-world applications.

Weighing just 200g for a 32 channel scanner, microDAQ has both CAN & Ethernet interfaces, providing 16bit data at up to 4kHz per channel with time stamping.

@: **info@chell.co.uk**
✆: **01692 500555**

Pumps

www.xyleminc.com

NEW Flojet LF Plus Compact Beverage Dispense Pumps Deliver a Streamlined Body and Quick Clean Capability Backed By Proven Diaphragm Technology

Backed by 35 years of excellence, Flojet pumps are the reliable choice wherever beverages are on the move

Flojet® (www.xylemflowcontrol.com/flojet/), a Xylem brand and leading manufacturer of small motor driven and air-operated pumps for beverage and industrial applications, announces the new Flojet LF Plus Beverage Dispense pumps line, a series of low flow industrial motor driven diaphragm pumps. The Flojet LF Plus pumps feature a slick, new design that reduces diaphragm cleaning time by up to 40 percent and weighs just 20 ounces.

@: **www.xylemflowcontrol.com/contact-us/contact-us-flojet/**
✆: **+44 (0)1992 450145**

Rugged Joystick Controllers

www.pennyandgiles.com

Rugged Joystick Controllers

Penny+Giles are a UK based global supplier of rugged joystick controllers to OEMs in a wide range of industrial markets.

Designed for demanding operator control applications in off-highway vehicles and other man-machine interfaces, where lever strength, signal reliability, and handle functionality are important. We use long life sensing technologies to maximize performance in the harshest of conditions.

Developed and qualified in the UK, our product range includes standard configurable designs in single or multi-axis styles, but we also specialize in providing unique custom designs for large scale OEMs.

@: **sales@pennyandgiles.com**
✆: **01495 202000**

Voltage Testers

www.weidmuller.co.uk

Weidmüller two-pole voltage testers exceed Standards requirements

Weidmüller has introduced six new versions of two-pole voltage testers that more than fulfil the revised Standard for these types of testers. They are rated to IP65, which means they are effectively sealed to offer protection against the ingress of dust and offer all-round protection against jets of water.

The two-pole voltage testers Digi-Check Pro, Digi-Check, Multi-Check, Combi-Check Pro and Combi-Check are CAT IV – 600 V instruments while the Master-Check belongs to the category CAT IV – 400 V.

@: **marketing@weidmuller.co.uk**
✆: **01162 823470**

Mechanical/Electrical Engineer

Location: Darlington, Durham
Type: Contract
Salary/Rate: £13.14-£15.74 ph

An experienced Mechanical/Electrical engineer is required to join a large technology company. You will have experience of working in a similar role, ideally having served a recognised apprenticeship.

Your skill range and experience will cover all aspects of repairs, maintaining and optimising high speed production machinery.

Ideally, you will have experience of pneumatics, hydraulics and diagnostic machining. Also, experience of Rockwell PLCs and software servo control is desirable.

For full details online, enter reference: qkCyAUU

Design Engineer

Location: Glasgow
Type: Permanent
Salary/Rate: Competitive

Due to continued success, this global leader in providing technologically advanced solutions for the oil and gas industry has an immediate requirement for a Design Engineer to join its Well Access Systems team, based in Glasgow.

You will generate conceptual designs, along with customising existing designs and preparing design layouts, using 2D or 3D drawing packages. Where necessary, you will be verifying designs using classical analysis techniques and formalise for use within product design folders and documentation.

The ideal candidate will be educated to degree level in Mechanical Engineering (or relevant discipline), coupled with extensive experience in a design role, preferably within an oil & gas or heavy engineering industry.

For full details online, enter reference: qkCyADh

Mechanical Systems Manager

Type: Contract Salary/Rate: Market rates

Job details:

- Day to day team management. (Up to 14 system engineers, inc 3 team leaders)
- Prioritise, balance and manage team workload. Forecast for next 12 months
- Deliver Performance Management Process, Mentoring and development plans
- Deliver recruitment strategy, including interviews and assessments
- Leadership of design reviews, problem solving and deliver good engineering judgment
- Lead system engineering best practice, including use of Engineering Handbooks
- Endorse/approve mechanical designs, reports, work packages and bid documentation
- Represent mechanical systems in strategic initiatives
- Excellent communicator and negotiator at all levels, particularly executive reporting, etc.

Ideally, you will have a rolling stock design background or design background within a similar industry or context.

For full details online, enter reference: qkCyAQn

Senior Design Engineer Aerospace

Location: Prestwick
Type: Permanent
Salary/Rate: £40k per annum

Job details:
A specialist design engineer is urgently required to work for an aerospace company leading the way in composite construction of wing components and propulsion structures and systems.

Role purpose:
- To act as the discipline expert for design, for a particular work package or process.

Key responsibilities include:
- Review and approve the work of design team members and contractors to fulfil customer expectations
- Identify design methods and techniques to be utilised for particular work packages
- Define design requirements to be met for particular work packages
- Define specific design skill set training required for a particular work package.

Person specification:
- Applicants will have significant relevant experience working in a similar role within the aerospace industry
- Working knowledge of Catia V5 and PDM Link is expected.

For full details online, enter reference: qkCyAB7

SOLIDWORKS

Sales Professionals

Realistic OTE
in excess of £75,000

Leeds / Durham
Leamington Spa
Fareham

A **sales** career with the UK's largest SolidWorks (CAD) vendor.

We are looking to expand our team of Regional Account Managers throughout the UK – both senior and junior positions are available. We have an established and extensive client-base, plus a strong track record for delivering customer satisfaction. The opportunities exist to easily exceed targets / earnings. We offer full training and career development to individuals with the drive and commitment to go the extra mile.

The role:
To develop customer relationships, to understand their needs and translate them into solutions that deliver real business benefits.

Your experience:
Industry experience is essential, but a prior sales role is not as full training is provided. If you have good academic qualifications, the ability to think laterally and are keen to focus your energy on the needs of our engineering customers then we would like to hear from you.

To apply:
Please send your CV marked for the attention of Alan Sampson to
recruitment@solidsolutions.co.uk

SOLIDSOLUTIONS

A **technical** career with the UK's largest SolidWorks (CAD) vendor.

We are looking to expand our team of high calibre Applications Engineers to maintain our market-leading position. To increase our standards we are committed to investing in the lifelong training and development of all our staff.

The role:
We require engineers to work with our customers to help solve complex engineering and design problems across a broad and diverse range of industries, deliver training and help present our solutions.

Your experience:
If you are qualified to HND/degree level, have the ability to think laterally and are keen to focus your energy on the needs of our engineering customers then we would like to hear from you.

3D CAD experience preferred, SolidWorks experience a bonus.

To apply:
Please send your CV marked for the attention of Alan Sampson to
recruitment@solidsolutions.co.uk

Applications Engineers

Competitive Package
+ Bonus

Leeds / Durham
Leamington Spa
Fareham

SOLIDWORKS

www.totallyengineering.com
Part of the totally engineering network
Sales: Darren Wright 01621 813393

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Ethernet

...connecting I/O over Ethernet quickly and economically

The multi award-winning Cube67 modular field bus system in Ethernet does not just provide innovative technology but real added value. It is possible to monitor systems and localize problems from anywhere in the world, and effectively counteract expensive downtimes.

Each of our Cube67 Ethernet bus nodes has an integrated Web server: for easy installation, simple servicing and much more . A PC and a network cable are all that are needed to perform an I/O check before start-up, for example.

Our new decentralized IP67 I/O system has all of the usual features, of course: parameterizable and plugable digital and analogue inputs and outputs, valve island and drive control, counter, logic & temperature modules, terminal modules as well as safety outputs.

EtherNet/IP™

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Murrelektronik Ltd
5 Albion St, Pendlebury Ind.Estate,
Swinton, Manchester, GB
M27 4FG

Phone 0161 728 3133
www.murrelektronik.co.uk
sales@murrelektronik.co.uk

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