

FEBRUARY | MARCH 2013

Products in Practice



CLADDING : **STEDELIJK MUSEUM**

DOORS & WINDOWS : **BBC/HURLINGHAM/NHS FINCHLEY**

FACTORY VISIT : **ENERGY-GENERATING COATINGS**

ENERGY EFFICIENCY : **TOO MUCH MOISTURE?**

EXTREME SPEC : **TILES FOR OIL RIGS**

TECHNICAL : **BIM – A NEW YEAR'S RESOLUTION**

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Welcome

...to the launch issue of *RIBA Journal's* Products in Practice, a five times a year technical supplement which concentrates on the products, innovations and issues shaping our construction industry. Within its pages you'll find the latest product news, IT musings, book reviews, factory visits, product focus features, QS costings and a special report that gets to grips in more detail with technical issues. Tired of parochial applications, we've also created Extreme Spec, which looks at products being used in far from conventional applications, testing the boundaries of the material.

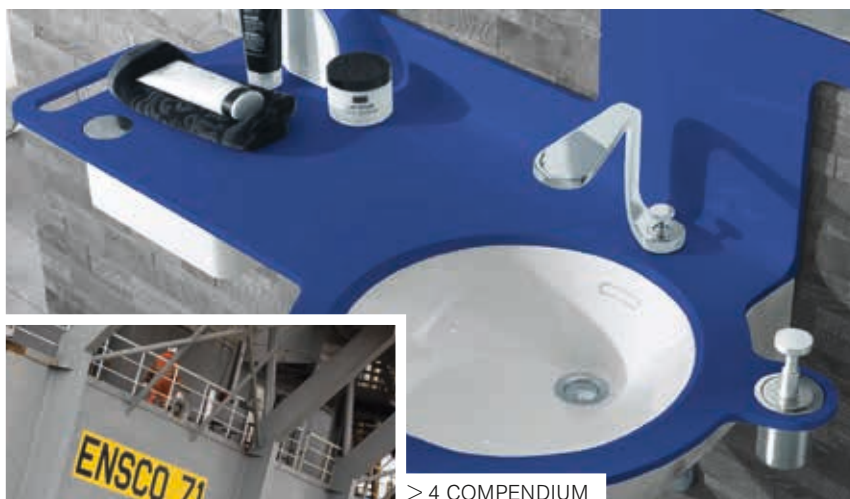
Creating *PIP* has been an interesting design exercise in itself. We've loosened up the rigorous format of *RIBA J* to create pages that we hope are

easy on the eye and which, like a good architectural space, are layered to help you orientate yourself immediately, linger a little, or peruse at leisure. And like a good building, we've enjoyed assembling it. This supplement wants to reach out to your knowledge base, so if there's a building or a product that you think we should be covering, we'd like to hear from you.

Contact me at jan-carlos.kucharek@ribajournal.com. I hope you enjoy the read.

Jan-Carlos Kucharek, Editor

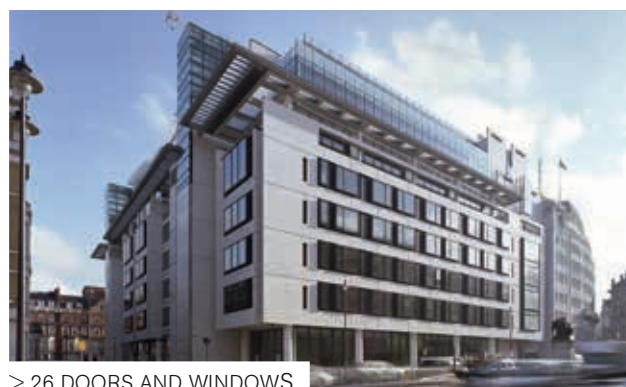
Our cover this month is from the factory making the Twaron fibre that makes up the cladding for our product focus, the Stedelijk Museum in Amsterdam.



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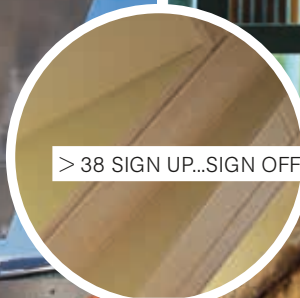
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Compendium

UPCOMING

5-7 February [Surface Design Show](#),
Business Design Centre London

27-28 February [The Concrete Show](#),
NEC Birmingham

5-7 March, [Ecobuild](#), ExCel London

12-15 March [MIPIM](#), Cannes, France

TILES' TWIN WIN

Two education buildings scooped top honours at the 11th ASCER Tile of Spain Awards, with the first prize in architecture going to a former abattoir in Medina Sidonia, Cadiz, and the interior design prize won by a teacher training college in Granada, Andalucia. The awards recognise innovative and imaginative use of Spanish ceramics in new buildings, and are open to entries from around the world. Winner of the architecture category was The Catering College by Spanish firm Sol 89 Architects, which put the building under dynamic angled roofs clad in 130mm by 130mm ceramic tiles. Ramón Fernández-Alonso Borrajo produced the college that won the interior design award, which used ceramic tiles on its ventilated facade and then brought them inside to form the ceiling soffit.



SILENCE IS GOLDEN

Harry Gordon Selfridge created a 'Silence Room' when his now world-famous department store opened in 1909 as a refuge for shopped-out visitors. Perhaps in guilty recognition of our consumer culture Selfridges has commissioned architect Alex Cochrane to create his own interpretation of the room in the store. This inner sanctum is isolated from the rest of temple of Mammon with gridded acoustic panels, within which felt mattresses are set in oak veneered benches for shoppers. Ceiling Services will remain exposed, celebrating 'their chaotic configurations against the ordered and minimalist setting of the room'.

BEHIND THE VEIL

Angers in France might have the Apocalypse Tapestry, the biggest medieval tapestry in the world, but it crossed the Channel, to where the Bayeaux version was stitched, to clad its dramatic new 250,000m² 'Atoll' retail complex. UK firm Formtexx was appointed by Antonio Virga Architecte and AAVP Architecture to manufacture the bespoke double curved aluminium panels, that make a spectacular free-form

archway over a road. White powder-coated aluminium panels on the 3D curved facade of were perforated to create a network of diamond patterns which can be backlit, creating an iridescent mesh veil of the building by night. The facade also acts as an effective acoustic and weather screen for the whole development. Formtexx used 3D

automotive design software to make the 4m by 1.5m panels to +/-2mm accuracy to ease installation. They were then coated and shipped to site for final assembly. Efforts to ensure accuracy at the manufacturing stage paid off – every panel fitted first time.





RICHARD ROGERS' ABLUTIONS SOLUTIONS

Spanish ceramics firm Porcelanosa and Noken has teamed up with UK architect RSHP and Spanish architect Luis Vidal to create MOOD, a bold new range of sanitaryware. RSHP created the sinks, toilet and bidet range in traditional ceramic mixed with new generation material Krypton, while Vidal co-ordinated the high tech, ergonomic brassware. Punters used to Richard Rogers' pared back industrial aesthetic in bathroom designs from the Pompidou to Barajas airport will be surprised by the more mannerist look of the MOOD range. But as Rogers explained at the launch, he views it as a completely different challenge, with a far

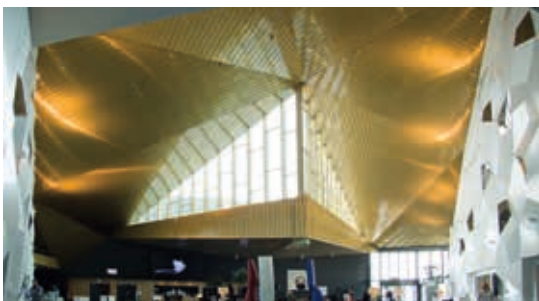
more intimate relationship to the end user. 'We learned very quickly from the toilets at the Pompidou that public will steal anything,' he said. 'There they were taken to pieces very quickly, and we had to redesign them – it's amazing what people can remove.' He called MOOD less 'surgical' and more 'humanist'.

RSHP thinks the sanitaryware could move into the corporate environment. Partner Ivan Harbour admitted: 'I know that this is bolder than commercial property agents might be happy with, but we see it being easily adapted for office environments, and hopefully public buildings – that would be wonderful.'



FAN ON THE SHANNON

The Irish town of Athlone's new Luan Gallery extension is now open, taking advantage of its site the banks of the Shannon river. Overlooked by Athlone Castle, the gallery commission was won by London practice Keith Williams Architects in a competition staged by the town council in 2009, and was opened to the public last December. If it was a squeeze on the opening night, it was nothing compared with the plant room space available for the air handling units servicing the gallery spaces. Manufacturer Fantech was brought in and after consulting with Dublin's Axis Engineering, fitted the right sized Komfovent REGO heat recovery and Elta fan units. REGO customised units can deal with heat recuperation, cooling, humidifying, dehumidifying, filtration and sound attenuating performance with temperature efficiencies of up to 80%.



A STAR IS BJØRN

It's like Nordic empiricism never went out of fashion. Oslo architect Space Group designed this retro-chic, triangular faceted atrium roof for the new Clarion Hotel in Trondheim to maximise views and pull light into the centre of the building. Conceived as a 'shattering star', the form is apparently best appreciated from either within the complex below or from the air – it's conveniently sited below the final approach path of the local airport. The roof is clad inside and out in manufacturer Aurubis Architectural's 'Nordic Royal' golden copper aluminium alloy. Project architect Jens Niehues said: 'The material had to meet the technical challenges of the demanding climate of the west coast of Norway... reflecting the function of the star, and giving it a rich golden colour.'

THE ONLY WAY IN SUSSEX

Sir Basil Spence can rest easy in his grave after Crittall refurbished the windows of Falmer House on his 1960s grade I listed University of Sussex campus outside Brighton. The firm fitted replacement W20 profiles and Corporate 2000 cold form doors for the campus gateway building. It supplied like-for-like replacements which English Heritage had to approve to ensure they were sensitive to the original design.

Speaking of Heritage, the window company, which since its founding 160 years ago has been based in its hometown of Braintree in Essex, has teamed up with the town's District Museum Trust and the District Council to digitise its own archive of drawings for posterity. The W20 window was synonymous with the development of modernism in the UK and abroad, and the new archive will provide access to over 2000 documents, catalogues and photographs.





Daniel Heselwood
is associate director
at BIM consultancy
Evolve

Stay slim with BIM

BIM is like a diet. Everyone starts working on BIM because it's going to make them more streamlined, capable of doing more and generally more attractive (to clients).

The inherent problem with any kind of diet is that you have to do it properly. If you spend the week eating salad but head out at the weekend to drink 10 pints and eat kebabs and pizza, you're going to undo all your hard work. The same can be said for BIM: if you go out intending to build an efficient model and input the required data to deliver against your requirements but end up over-modelling and adding too much detail, your design will be 'fat'.

With this in mind, I've started reviewing my clients' models using the terminology of the classifieds:

> Fat: This model carries too much detail, too much information. Not your first choice to take to a dinner party (client meeting).

> A few extra pounds: One you keep hanging in the wings in the event the perfect one can't make it.

> Average: Perfect model, all the right information curves; a delight to be around.

> Athletic: Looks good in principle but probably

doesn't have much to talk about.

> Thin: Looks good from a distance but just doesn't have any substance.

Part and parcel of all good diets is the local gym. Joining a gym is great – some people have the passion and drive to go it alone but others find a buddy helps keep them motivated, especially when that person has already achieved what they're aiming for. This is where working with a consultant can be useful (shameless plug) or taking advice from other members of the design team who have already been through the process. They know the trials and tribulations of 'joining the BIM gym'. Their

If you spend the week eating salad but head out at the weekend to drink 10 pints and eat kebabs and pizza, you're going to undo all your hard work

experience can help you ditch that spare tyre.

So you have decided to start using BIM. You've found someone that can help you skip some of the hurdles. The final step before you can deliver is training. There are many different approaches to training; the one you choose should be based around your learning style. There are three main styles that you can choose from:

> Visual: This could be through reading, for example 'BIG BIM little bim' by Finith Jernigan, 'UK Government BIM Strategy', or the AEC (UK) BIM Protocols.

> Auditory: There are ample conferences where you can listen to others' experiences of the big bad world of BIM, for example Inside BIM which is organised through social media, BIM Show Live by Building and Building Design magazines, or London Revit User Group, which also has regional versions.

> Kinesthetic: A training course is usually the starting block for experience in BIM. Treat the training as a project workshop where you can use a consultant's expertise to help set up and mentor you through starting the project, learning on the job. ●

Tech books



BIM DEMYSTIFIED – An Architect's Guide to BIM
Steve Race
RIBA Publishing £19.95

When I first picked up this book I turned to the index to find the definition of IFC. As I understand it, Industry Foundation Classes refers to the interface through which different BIM software platforms talk to each other, facilitating cross-platform BIM communication among design teams. IFC's omission from the index highlights both the strengths and weaknesses of this book. It is a good general introduction to BIM, covering first principles, the business case, setting up systems in the office, implementation and the legal framework of BIM in a collaborative context.

But it doesn't cover the nitty gritty, which gives it a sense of academic abstraction. Issues such as the pros and cons of various systems, surely of interest to anyone about to spend significant capital on tech-up, are ignored. There is no reference to 'AutoCad', 'ArchiCad' or 'Microstation', let alone a comparative look at them. This is a good read for the novice, but for those seeking hard facts on things like software choice, perhaps too easy.



MATERIAL MATTERS – New Material in Design
Philip Howes and Zoe Laughlin
Black Dog Publishing £19.95

Material Matters is a wish list of innovative, high-tech materials and processes being investigated by designers and industry. It makes an intriguing read, helped through the simplicity of its anthology-like presentation. The authors break their collection of materials down into typological sections – metal, glass, ceramics, polymers and composites. Each material is then expounded in two or three pages – a brief description, properties and fabricated examples, with websites. A final section, 'Futures', looks at biomimicry, biomaterials and nanotechnology and speculates on the direction of experimental research in these fields – even the possibility of creating energy cells of coffins, drawing their energy from the decomposition process. Neat, visually stimulating and informative, the book provides the architect/designer with a great primer of contemporary materials science and suggests the possibilities inherent in them – some beyond the current remit of architecture perhaps, but a fascinating read nonetheless.



THE PASSIVHAUS HANDBOOK
Janet Cotterell and Adam Dadeby
Green Books £35

The back cover states that the authors, an architect and a Passivhaus consultant, each with over 20 years' experience, are directors of Passivhaus Homes Ltd. This statement of vested interest also suggests the expertise that both of them can bring to their subject. As a result, this is an in-depth study of the Passivhaus methodology, whose principles still polarise UK architects. Split into two parts, the first section covers 'The How and Why of Passivhaus' while the second is a practical guide to their construction analysing key issues such as thermal bridges, airtightness, moisture, windows and ventilation. Information is broken into digestible nuggets of information with box-outs, photographs and diagrams, illustrating both the benefits and potential pitfalls of the technique. The appendix carries a brief illustrated guide to certified UK Passivhaus projects, giving opportunities for architects to experience the technology for themselves. A valuable starter for architects wishing to pursue their own investigations.



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Offshore

Main image: The Ensco 71 spent three months being refurbished in Hartlepool.
Below: With two shifts every 24 hours, the rig's galley undergoes heavy footfall.
Bottom: Tiles in the saunas, wetroom and gym.



WHAT: CERAMIC FLOOR TILES

WHERE: ENSCO 71 OIL RIG

'Life is hard and there are real risks on the drill floor of an oil rig – and in the North Sea it's particularly harsh,' says Rigit director Brian Knowles. 'You're away from your family in a challenging environment for two weeks a month, and it's our responsibility to make people as comfortable as possible.' Rigit, a specialist oil rig contractor, started in 2002 with Knowles doing general carpentry, but has grown to over 100 people, carrying out full-scale refurbishment for the likes of BP, Shell and Total. Based in Aberdeen and Dubai, Rigit's turnover is over £48m.

With an £8.5m budget, the Ensco 71 rig is its largest project to date. Refurbished in Hartlepool, it is now stationed off the west coast of Denmark. Expanding the person on board (POB) capacity from 84 to 98 meant craning in a 12m by 18m by 9.5m high box containing ensuite accommodation cabins, and a radio room, plant and living quarters. Existing galley kitchen, mess hall, dry stores, walk-in freezers and ablution areas were also refurbished.

Knowles explains that it's not building regulations that the refits have to adhere to, but maritime law, which depends on whose waters you're in. The North Sea is

subject to DNV Classifications (Det Norske Veritas), a Norwegian foundation set up in 1864 to evaluate the conditions of its national merchant vessels. 'They're the most onerous of the lot,' says Knowles, 'primarily concerned with the fire retardancy of vessels at sea, but other organisations will have a say – the American Bureau of Shipping for example, and Lloyds of London.'

Of the 100 or so people on the rig, about 10 will be full-time staff overseen by the 'camp boss', whose sole purpose is to do carry out the cooking, room cleaning and laundry for the other 90 drill floor workers. Drilling is 24-hour activity and spaces like the galley and mess room are busy round the clock, with day and night chefs keeping the kitchens churning out three meal options per sitting.

Workers that haven't burned off the calorie quotas on the drill floor have a gymnasium, sauna and solarium to work off the rest. Knowles says that all the products his company specifies have to be able to resist the demands of almost 24 hour use. In the hard-earned leisure time, the solarium is obviously well-used – Knowles quips that workers are seen coming back on shore sporting a very particular shade of orange... ●

DORSET WOOLLISCROFT TETRA TILES ON THE ENSCO 71

- > Fully vitrified dust pressed tiles
- > 4 colours, 2 formats: 148x148mm and 300x300mm
- > Coverage (tiles per m²) 44 (148x148), 11 (300x300)
- > Slip resistance: Pendulum Dry 65. Pendulum Wet 55. R Value R11. Barefoot Ramp: C. Displacement Vol:V4
- > With surface profile, good slip resistance qualities
- > Suitable for internal and external use
- Wet areas, retail locations, light industrial units, external walkways
- Food preparation areas where soiling is likely
- > Good volume displacement properties as profile pierces surface debris

Dorset Woolliscroft Tetra 148mm by 148mm floor tiles in steel grey were installed in the Ensco 71 rig's main galley, changing rooms, toilets, hospital, and leisure and sauna areas. Tetra's pyramidal surface profile is slip resistant for barefoot and shod traffic. John Henry, project manager for Dorset Woolliscroft, says that through supplier Aberdeen Tiles, the tiles have a long history with rig fit-outs. 'They've also been specified on Fred Olsen cruise liners, as well as MoD buildings and schools. They're generally tested on more demanding projects,' he says. 'Here they were specified on around 200m² of floor. Henry explains that since rigs are refurbished every four years, that's how long specified products are expected to last. The 148mm by 148mm module is small to specify for floors, but there's a reason. It allows for the falls needed to drain the floor and reduces the possibility of individual tiles cracking. The build-up is a marine-rated cement screed primer with up to 50mm insulation, topped by a thin layer of 4-6mm diameter pumice pellets to level the surface, and a final 3-4mm top coat screed.



The Steiner Academy in Hereford is a refurbishment and extension project of an old Victorian school, a range of 18th Century barns and medieval farmhouse.



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Ecobuild

Ecobuild will run at ExCel, London from
5-7 March 2013. www.ecobuild.co.uk

This is a long, damp and dark winter, but at least this year's Ecobuild is offering a ray of sunshine to brighten up March. Hailing itself as the 'world's largest event for sustainable design', which last year drew over 57,000 visitors, this year's claims to be pulling together the 'largest gathering of architects in the UK'. This promises much – not least because for the first time it has an 'expert industry advisory board' to help push the event's environmental agendas. And the list of members reads like a roll call of the green and the good, with the likes of Paul King, chief executive of the UK Green Building Council, Denise Bennetts, founding director of Bennetts Associates, Ben Wielgus, KPMG sustainability advisor and John Connaughton, professor of sustainable construction at Reading University.

So what can we expect? The show will have a 12 stream, three day seminar programme with speakers covering design, property, policy and latest sustainable thinking – all of this fully CPD-accredited. Tailored for the profession, the 'Design Architecture and Sustainability' stream will kick

off on Day 1 with RIBA president Angela Brady and Louis Becker, partner at Danish firm Henning Larsen, on the foxy assertion that 'Sustainable design should be irresistible design'. Meanwhile, Tom Hodgkinson, editor of *The Idler* and publisher of the notorious *Crap Towns* series will be 'Encouraging sustainability through art' along with psychologist Oliver James. Kieran Long, the V&A's new senior curator of contemporary architecture, design and digital will be concerning himself with the rather more prosaic issue of 'How far wood can replace concrete and steel.' And for the IT crowd, Arup, Make Architects and Penoyre and Prasad

The Future Materials Gallery is being cooked up as a prep room of biomimicry, thermobimetals and 'blue smoke' – apparently the world's lightest solid

will ask 'Is BIM the saviour of sustainable design?' Professor Herbert Girardet, co-founder of the World Future Council will address 'Lessons from the past'.

And it seems the event's PR guys have gone into overdrive this year, coming up with new features and attractions. The Light Box pavilion is set to showcase the best energy efficient lighting products, while the Biodiversity pavilion will provide practical advice on creating rich, bio-diverse environments. Backed by Defra, its green infrastructure pavilion, Natural, Sustainable will have daily interactive demonstrations of technologies like straw bale construction, lime rendering, rammed earth and clay plaster. And the Future Materials gallery is being cooked up as a prep room of biomimicry, thermobimetals and 'blue smoke' – apparently the world's lightest solid. Aside from the seminars and side-shows there will be products and initiatives by up to 1,500 organisations involved in green infrastructure – more than enough to keep eco-conscious architects excited for the full three days. But personally? Well, my legs are crossed in anticipation of the cornucopia of delights that await me at the Green Deal Terrace. ●

PIP takes a look at a selection of products launching at this year's show



LED HANDRAIL SYSTEM BY AALCO

Ecobuild will see the launch of a new handrail system from Aalco. A recess on the underside of the rail houses a specially-developed ribbon that carries LEDs every 30mm, which produces more than 180 lumens over a length greater than 180mm. Very strong and durable, the LED ribbon is suitable for use indoors and out. The system provides close proximity lighting to stairs and walkways, helping to increase safety and security without the need to light an entire area. And the low energy consumption of LEDs cuts costs.

Stand N235
www.aalco.co.uk



FOLDING DOORS BY REYNAERS

Reynaers is launching two new products at this year's show. In response to the demand from architects for more aesthetic designs to maximise light in spaces, the CF77 Slim Line folding door is a finer variant of the CF77 sliding door – a flexible option to increase openings while maintaining high insulation. Meanwhile the CP130 Lift and Slide duorail sliding door is a new corner-closing design that needs no fixed corner element. Its low threshold detail means high-traffic interior spaces can be extended to the outside with a minimal step.

Stand N550
www.reynaers.co.uk



STOVENTEC BY STO

Inaugurated on the recently completed the £45m Plymouth Life Centre by Archial Group, where over 1000m² of the product was installed, StoVentec rainscreen cladding system will be formally launched by Sto. This stainless steel subconstruction carries coloured toughened glass panels that will not fade over time. On the Plymouth Life Centre the system was used with Sto's external wall insulation system, making the firm responsible for construction of the whole façade. The system also comes with built-in photovoltaic technology.

Stand N610
www.sto.co.uk



NRG+2 TOURNIKET BY BOON EDAM

Boon Edam's NRG+2 Tourniket revolving door goes one further than sliding or swing doors in saving heat energy. Equipped with a power generating unit that converts kinetic energy into heat as people pass through it, it effectively increases this disparity even further. Boon Edam will also showcase Ecolane, a concept security lane design made entirely from recycled materials, and will demonstrate its bespoke energy saving software, highlighting the savings that can be realised through the use of revolving doors in buildings.

Stand N816
www.boonedam.co.uk

focus on sustainability

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Made

Specific research director and Swansea University professor of engineering David Worsley (left), and Specific industry director, TATA Steel's Paul Jones.

WHAT: ENERGY-GENERATING COATINGS

WHERE: SPECIFIC PILOT PLANT, PORT TALBOT

Industry and university researchers are uniting to create buildings that make their own energy from the structure itself

A building that can act as its own power station? Whose every external surface has the ability to generate electricity from its very skin rather than through photovoltaics? Sounds slightly far-fetched, even in our sustainability-driven world, but it's clear this idea has a lot riding on it – at least in south Wales. Just along from construction giant TATA Steel's Port Talbot works and less than a month before the firm announced 600 job losses at the plant, business secretary Vince Cable and Wales first minister Carwyn Jones opened the Sustainable Product Engineering Centre for Innovative Functional Industrial Coatings' (Specific) first pilot production plant. Its job is to bring forward the high performance coatings produced by university-based research for adoption on a mass scale – all in the hope of kick-starting a new £1bn industry and generating 10,000 new construction jobs.

The pilot plant is the product of an initiative which, says Specific research director Professor David Worsley, aims to plug the gap between university research and industry and manufacturing. Central



and local government has sunk £20m of funding into the Specific project, matched with industry know-how and manpower from TATA, NSG Pilkington Glass and BASF. The job is to create a electrically conductive coating that can be economically applied to both steel and glass, developing huge possibilities for energy generating cladding.

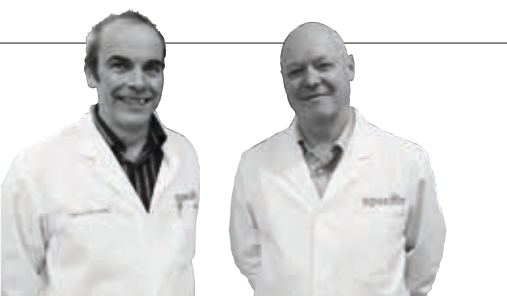
Paul Jones, industry director for Specific, has been seconded from TATA to bring commercial nous to academic innovation. 'A scientist will want to create the most efficient system, but my job is to optimise processes so they're fit for industrial scale roll out and suitable for the market,' he says. 'We're here to strike the balance between the amount of energy that can be created from the coating and the upscaling of the process for a production line'. The aim is to perfect a coating that, while half as effective as a standard PV panel, can cover the building facade and costs far less per square metre.

'TATA makes 100 million m² of steel composite cladding a year and NSG Pilkington 200-300 million m² of glass,

and just 10% of this could generate as much energy as a peak load nuclear power station,' says Worsley. 'The material bends, so architects will be able to form energy generating curved panels,' he adds. The potential, and its rewards, are enormous.

Developing the all-important conductive coating involves constant iteration between laboratory conditions, where the properties of the conductive material are ascertained, and the pilot plant, where application to metal and glass panels and drying techniques are being developed to see whether they can be translated into factory scale processes. Economies of industrial production are not generally allied with laboratory environments, as lab techniques often use processes and chemicals that are inconsistent with large-scale production. Materials used in manufacture have to be cheaply available, economic to make and non toxic.

Other factors also come into play. One team is working on battery technology, analysing the surfaces that will store the accumulated energy from cladding panels



PV COATINGS PILOT PLANT

TATA's interest in the development of thermodynamic and electroconductive coatings for steel started in 2008. The high quality and long product warranties of its steel sheets offered potential for manufacturing cladding that could have 'functionalised' surfaces. The photovoltaic conductive compounds mixed with dyes – the most efficient of which are brown tinted (pictured left) are being developed and tested in the laboratory. But they also have to make manufacturing and economic sense in the pilot production facility across the road from the lab, where the aspiration is for 20 tonne reel-to-reel coils of steel rather than batch processes. While the pilot line is a 'clean room' facility, it does not reach the levels of those seen at, for instance, silicon wafer manufacturing plants – and this distinction is important in production terms. Here, the aim is merely to minimise the coating's exposure to debris, which on the finished glass or metal sheet could potentially create a 'short circuit'.

for future use. Another is looking at how coatings can be formed of precision-engineered particles with a surface area 5000 times greater than the surface it sits on; a third at how these surfaces can be pulled up like stalagmites from the substrate to radically increase the range of sun angles they remain effective in. One specialist team is looking at the generation of thermoelectric energy through temperature differentials across two surfaces of a composite panel, technology that was first used on the space shuttle programme.

Perhaps all this blue sky thinking has driven Specific's plans to generate real-world applications on site – notably with cladding its own factory. Meanwhile this fusion of academia and industry continues to learn how to live together. 'This is innovation at the sharp end,' says Worsley, conceding that this open-ended research does not sit easily with the traditional results-based thinking of industrialists. 'But they're coming around to the thinking that if you can plan for it, then you're not dealing with a breakthrough technology.' ●



> LAB TESTING: COATING EFFICIENCY

Since the darkest, most heat absorbent surfaces are the best electrical generators, black would be the most efficient. But black is a problematic colour for a glazed panel, so organic dyes were introduced to the compounds, which, while reducing efficiency, increase marketability. Brown and purple are efficient, but NSG Pilkington wants to concentrate on blue prototypes as it currently sells far more blue than brown glass. Red and yellow dyes, with lowest conductivity, are also being looked at for their appeal to the commercial market. Coating degradation is analysed over time in the lab to assess longevity under long-term exposure to sunlight.

> SCREEN PRINTING

Four fundamental pieces of equipment in the pilot plant facilitate the potential full-scale application of the conductive material on a panel's surface. These allow them to be screen printed or coated, with a prototype industrial dryer and a unit for special high temperature treatment if necessary. Two production lines can fit in the space, one of which is currently producing coated steel and glass sheets of around 1m². This time next year it is hoped a 2m wide reel unit will be installed, increasing speed of production. Any developments will be subject to production efficiencies, economics and any designs' likelihood of market uptake.



> ROLLER COATING

The two main units are a flat bed screen printer printing patterns and contacts in the electroconductive medium – but with limited capacity for single sheets – and a roller coater. Both are suitable for coating glass and are off-the-shelf machines. Depending on the substrate, coating layers typically range from 5-100 microns, but layer consistency is key. Too thick and resistance can build up and cause electrical loss through heat generation; too thin and conductivity disappears. The team is looking for the 'sweet spot' where thickness and consistency optimise electrical conductivity. The production line is also geared up for future ink jet printing.

> HIGH TEMP TREATMENT

Once screen printed or coated, sheets pass through an oven on a conveyor. The speed at which the sheet is passed through it dictates the drying temperature, with slower movement producing a higher sheet temperature. Glass and metal heat up at different rates, which also affects conveyor speed. The surface treatment unit is a bespoke piece of equipment that uses high intensity light to generate a 500°C blade of heat, requiring 300kW of heat energy to be directed over a small area of the panel via high-voltage units (right). A factory can replicate these temperatures, but they are an order of magnitude above standard production line processes.



The UK **CONCRETE** Show

February 27 & 28, 2013 The NEC, Birmingham

The show that's ALL about concrete

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Yes, without a doubt. The theme of the 2013 show is "**Beautiful Concrete**" which comes together as a group of specialist exhibitors supported by an outstanding, specialist seminar programme and by our new, "**Exclusively CPD**", seminar theatre.



Beautiful Concrete

Astonishing photo engraved formliners from **RECKLI** (see photo left), fair faced formwork technology from **PERI**, coloured concrete technology from **LAFARGE** and **LANXESS**, polished concrete surfaces from **HTC**, all are at the heart of the show theme.

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“BEAUTIFUL CONCRETE” SHOW

will demonstrate the architectural possibilities

THE UK CONCRETE SHOW, Europe's largest specialist concrete event - now in its third year - has moved to the National Exhibition Centre (NEC) Birmingham for 2013. Of the two themes of the show, one should be of particular interest to the architectural community: "Beautiful Concrete" will highlight the creative potential of concrete in both design and finish. Some of the venues recently constructed for the Olympics in London, demonstrate the methods and effects possible such as fair-faced concrete and special effects using custom form liners, colour and texture. The second theme: "Advances in Cement Technology" will show how concrete will continue to reduce energy consumption and emissions and become an increasingly sustainable material.

Bigger than previous shows

Organised by Marwood Events, the show is the largest of its kind in Europe and in the top three worldwide with 200+ exhibitors expected. Housed in its bigger venue in the newest atrium section of the NEC with 3000m² of adjacent open-air displays, floor space of the show will increase from 6000m² to almost 12,000m².

Exciting seminar programme

The show will deliver a programme of over 40 topical seminars in four theatres including one dedicated exclusively to CPD presentations. Revolving around meeting the needs of trends in modern architecture, Professor Michael Stacey, Chair in Architecture and Director of Architecture at the University of Nottingham, will give a keynote presentation for architects entitled: 'Concrete Poetry - Tectonics, Ecology and Architecture'.



Some of the venues recently constructed for the Olympics in London, demonstrate the methods and effects possible such as fair-faced concrete and special effects using custom form liners, colour and texture.

Professor Stacey's address will be followed by other presentations examining all aspects of the design process when using concrete, including two seminars looking in detail at the construction of the iconic 'Shard', featuring Project Director, John Parker from engineers WSP. Other highlights of particular interest to the architectural community will include 'Sustainable Cements for the UK market' chaired by Dr Pal Chana and presented by Dr Bill Price, the National Commercial Technical Manager at Lafarge Cement UK. The UK cement market has changed significantly over the past decade, with an increasing emphasis on sustainability. Guidance on the choice of the optimum 'green' cement for different applications will be discussed and examples of high-profile projects using sustainable cement technology are to be presented.

An improved visitor experience

The move to the NEC means that the visitor experience will be greatly improved – new catering features include a central networking cafe in the heart of the show with free Wi-Fi access to the internet, a fine dining in-hall restaurant and a further self service restaurant plus the Mix-It coffee bar in other parts of the hall.

The show has also launched its own free smartphone app available to owners of iPhones and Android systems for download from their respective stores and there is also a browser only version available for Blackberry and Windows systems phones. This new technology will put the show "in the pocket" of both visitors and exhibitors giving a list of exhibitors searchable by product, exhibitor profiles, seminar listings, timing and details of speakers. Nearer the actual time of the show, the app will enable full networking facilities to allow visitors to request timed appointments with exhibitors at the show and an interactive floor plan that will show not only the users' location in the hall but also their route to their next appointment.

For in-depth detail on the UK Concrete Show 2013, download the free Smartphone app from the App Store or the Android Market (Search under "The UK Concrete Show") or get the online event planner from the show website where you can also register for your FREE entrance ticket and complimentary parking provided by the organisers:
www.concreteshow.co.uk

Stedelijk Museum

One of modernism's first white cube interiors sees the look turned inside out on its new extension

JAN-CARLOS KUCHARÉK

Cutting an imposing figure on Amsterdam's Museumplein with its huge, composite-clad bathtub-shaped extension, the Stedelijk Museum has, not for the first time, been redefined by the colour white. Way back in 1938, when the city was amassing a world class collection of Picassos, Braques, Chagalls and Kandinskys, the avant garde Willem Sandberg chose a wholly new way to curate the works that heralded the new thinking of the 20th century. Eschewing the internal polychromy of architect Willem Weissman's 1895 neo-renaissance edifice, Sandberg did the unthinkable and exploded white paint all over the building's internal walls – making the museum, with the recently opened MOMA in New York, one of the first of the 'white cubes', that have defined modern art galleries ever since.

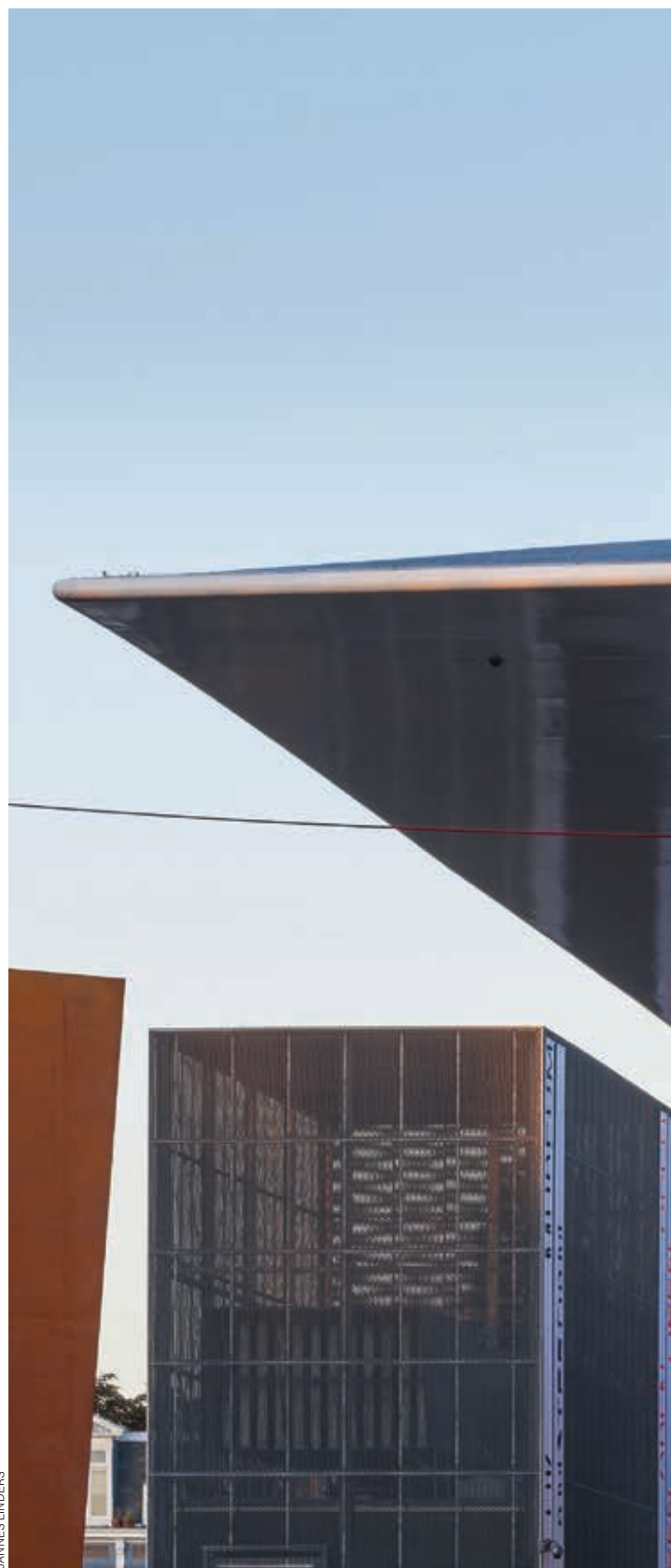
Interestingly, responsibility for the design of the just-completed extension fell on the shoulders of the architect son of Wim Crouwel, another Stedelijk luminary, whose graphic design and typography defined the museum from 1964. After 20 years of abortive competitions that saw off the two previous winners Robert Venturi and Alvaro Siza, the contentious extension to the Stedelijk Museum was finally built by Dutch practice Bentham Crouwel, with a radical contemporary white design that not only turns the museum inside out but also flips it round 180 degrees, creating a new main entrance from the Museum Square side rather than Paulus Potterstraat to the north.

Partner Mels Crouwel makes no bones about the fact that the dramatic bathtub

form of the € 75m extension, which doubles the size of the museum to 8000m², was wholly down to Sandberg's groundbreaking act of artistic vandalism – and in creating it, the architect had to resort to some pioneering thinking about the cladding to ensure the seamless aesthetics of its design proposal was achieved in the built reality. There was never any thought, even from the heritage lobby, that the wholesale renovation would take the original building back to its polychromatic state – its 1938 version was in everyone's mind. Crouwel took this as a strong signal that any new building could externalise the inner radicalism of the ornate brick façade. The extension, which only kisses the original building at two points, creates some galleries below ground and lifts the rest 8m into the air to connect with existing gallery spaces. This releases a ground floor lobby that takes up half the area it was intended to occupy, and which appears to allow the Museum Square to flow inside the building.

The steel structure, at over 100m long, runs the length of the original building's south facade, with its 65m free span, engineered by Arup, effectively a bridge structure that allows the whole building to transfer loads down on only four columns. Bentham Crouwel was keen to develop a seamless aesthetic to clad its bathtub design, looking at a number of materials. Crouwel initially investigated aircraft and boat fabrication, at one point visiting Future Systems' Lord's Cricket Ground Stand in London, but noted that close-up,

Below: View looking west at the 12m cantilevered overhang of the south-facing facade of the museum extension. Reflections are barely disturbed, as in a canal.



JANNES LINDERS

Right: The 65m span of the huge steel bridge structure sits on only four columns.
Far right: The finished facade, showing the elevation stepping to deal with solar orientation.



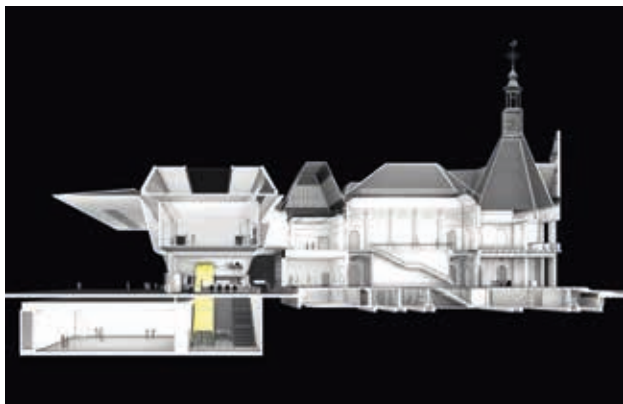
FACT FILE

Teijin Twaron Type 2200, 8050 dtex

- > Twaron has unique properties. It is five times stronger than steel, has large dimensional stability, no melting point, low flammability, is not conductive and is sustainable.
- > Type 2200 is a high modulus aramid fibre, which means the fibre has an optimum level of rigidity, the lowest possible elasticity at a specific force.
- > The quantity of Twaron used in the facade of the Stedelijk Museum is 4850kg – the same as approximately 6000km of fibre.
- > Twaron is normally used to fortify bridges and concrete pillars in seismic areas, yachts, car tyres, heat resistant products and bulletproof vests.

Teijin Tenax Carbon Fibre Type STS 40 24k

- > Tenax is a standard type of carbon fibre suitable for composite applications in such areas as the car and aircraft industries.
- > 24k means the fibre consists of 24,000 filaments – the number of threads per bundle in the fibre. The more threads, the stronger the material. 24k is extremely strong.
- > The quantity of Tenax used in the fibre for the Stedelijk Museum is 4050kg – approximately 2500km of fibre.



JANNES LINDERS

JANNES LINDERS

aluminium panels are riddled with surface inconsistencies. He was also aware that the only way it could construct the facade would be by forming it from a multitude of smaller panels, which would need joints to allow for thermal expansion. Since this opposed the seamless look the architect wanted, it approached Dutch engineer Solico, which has extensive experience in the use of strong, lightweight materials for the construction and defence industries. Solico recommended creating the facade from a composite formed of Teijin Twaron Aramid fibre and Tenax carbon fibres, which together display interesting properties. Whereas the fibres contract on exposure to heat, the resin matrix in which they are held expands. The net result is that the overall coefficient of thermal expansion is almost zero, even in the stated -25 to +35 temperature range, obviating the need for any expansion joints at all.

Manufacturer Holland Composites was contracted to produce a prototype that would meet Solico's design criteria of a super flat, super smooth finish. Rigidity was

needed to ensure the material didn't buckle or warp in windy weather, as on such a large high-gloss surface any distortion would be immediately visible. The 185 composite panels for the museum's facade were made of two layers of Twaron/ Tenax fibre bonded around 70mm of high performance PIR insulation. The size of individual panels was set by what could be legally transported by road the 70km from factory to site.

The huge tapering 12m roof soffit, clad in the same Twaron composite that cantilevers over the Museum Square, Crouwel explains, is more than just aesthetic. It was designed to cut out solar gain to the south facing main entrance lobby at the hottest times of the year, as well as to provide shelter from the rain for the public during the most inclement. To the east and west the facade was modified to take on board internal climate concerns – the section steps down to the west with low levels of glazing to cut out penetrating afternoon light while to the east it steps up, fully glazed and open to the views and cooler sunlight.

The white-clad bath tub form is in fact

Top left: The huge structure sits on a basement concrete box containing the largest of the gallery spaces.

Above left: The new museum physically impinges on the old at two circulation points.

Above right: The absence of expansion joints in the Twaron/ Tenax carbon fibre facade creates a seamless, slightly abstracted, aesthetic.

the inverse of Sandberg's original notion. Whereas he hid a modern form within the traditional, Bentham Crouwel has continued the traditional form within the modern. Internally, the new upper level galleries are indistinguishable from those Sandberg created, despite the radical external expression. Even the 13m long escalator that connects the upper and basement galleries is encased in a white 'sleeve' that bypasses the ground floor and reinforces the sense of homogeneity of old and new spaces, without needing to perceive the 'newness' itself.

This one move throws up questions that go to the core of its architecture, based on the historical and cultural suppositions that the design is seen from. If the building is supposed to perform to a 'traditional' modernist reading, it should define itself as functionally and formally distinct in every respect from the 19th century Weissman building. Yet Crouwel has no aesthetic difficulty with the internal blurring of the boundaries of old and new, or indeed with the assumed neutrality of the colour. 'I was



almost raised in this museum. There is no question that white remains the right colour in which to view contemporary art,' he says emphatically. His is an alternative view. In embodying Sandberg's original spirit the extension becomes a metaphor – an inversion and externalisation of the curator's modernist intent. Crouwel's building in its smoothness and seamlessness is but a 'lost wax casting' of the existing building's interior. Flipped, inverted, extrapolated – an Amsterdam whiteout. ●

Architect: Benthem Crouwel Architects
 > Lead architect: Mels Crouwel
 > Project architect: Joost Vos
 Client: City of Amsterdam
 Construction manager: DHV Bouw en Industrie
 Building contractor: Volker Wessels
 Engineer: Arup
 Technical engineer: Imtech
 Technical engineering adviser: Huisman en Van Muijen
 Acoustics advisor: Cauberg Huygen
 Raadgevende Ingenieurs
 Twaron® supplier: Teijin Aramid

CONSTRUCTING THE STEDELIJK'S FACADE

1 Delivering the huge composite panels to site involved convoys of trucks arriving at the site before 6.30am – a logistical feat that took over six weeks to achieve. The site had been completely isolated from the environment around it – sealed with plastic, heated and even with air extractors installed to ensure that it was virtually dust-free. These conditions were necessary to ensure that no dust or rain settled on the panels once they had been positioned and were ready to be bonded and sanded together, and finished with the final layer of high gloss paint.



2 Mounting the panels was a precision exercise. Each had to be laid absolutely flat so no distortions would be evident in the completed surface of the 100m long and 25m wide façade. The 185 panels required nearly 1800 mounting points fixed to the steel structure, necessitating a +/-3mm tolerance on the main structure. However, a greater level of accuracy was required to ensure that panels were not fixed distorted. A surveyor using laser measurement ascertained the accuracy of the position of each mounting point.

3 Holland Composites, which was fixing the panels, designed a set of six plastic caps that could fit over each mounting point on the steel structure. These could shift the position of the panel relative to the mounting point by up to 3mm each way. Once inaccuracies were noted, workers scaled the structure to adjust the caps. To protect panel surfaces during lifting, cherry pickers were fitted with rubber sucker vacuum clamps. Each panel was fixed to the structure with up to 15 hooks, which had to be placed over the plastic mounting points simultaneously. A remote device positioned panels exactly before they were lowered into place.



4 After mounting, adjacent panels needed to be bonded together to create one single surface. Panels were designed so that there was a 5cm gap between the Twaron reinforced outer skins of each. A strip of aramid reinforced laminate was then run along this gap and bonded directly to the PIR foam beneath. This effectively bridged the panels and made the cladding behave as a single unit. At this point the façade is virtually homogeneous.

5 To create the semblance of a single seamless surface, the whole façade had to be painted in one go. This involved a four-phase painting method. At one end of the façade paint sprayers were installed at three levels – one above the other – raising them off the ground on moveable aerial platforms. These 'platforms on wheels' were then carefully driven along in synch with each other, with their onboard sprayers coating the façade as they went, creating in their wake a smooth, seamless and glossy white surface.



Specified



1 ROOF SYSTEM EUROCLAD

Marks and Spencer's third Sustainable Learning Store (SLS) at Cheshire Oaks outside Chester features a Euroclad Elite 4.17 roof system. Such stores are part of the M&S's commitment to build a bank of knowledge in sustainable building practices. The roof system was chosen for its minimal environmental impact, with 11,000m² of multi-waveform standing seam roof, glass wool insulation, (which helps achieve the 0.17 U-value) and curved liner sheet. The reflective aluminium roof reflects excess heat while the lamb's wool roof insulation contains recycled post-consumer waste (bottle glass) along with recycled glass wool.

euroclad.com

2 CURTAIN WALLING WICONA

Architect 3DReid specified curtain walling from Wicona for Glasgow's Emirates Arena and Sir Chris Hoy Velodrome. The £116m development that houses the two venues, built for the 2014 Commonwealth Games, employs Wictec 50 curtain walling to accommodate large unsupported spans of glass of up to 4m long. The system has a 50mm profile with an extra-narrow face width. The system spans four storeys on the hub that links the two venues, and 77m long screens of grid curtain walling were constructed to enclose the arena.

wiconaco.uk

3 VIVIX PANELS FORMICA

Formica laminate has been put to unusual use in Spain, cladding the mixed-use Espai Ridaura at Santa Cristina d'Aro. Employed on the building's roof and for the dramatic 20m entrance canopy – which originates in the auditorium entrance hall, passes through the glass entrance and projects outwards – the Vivix exterior facade panels were selected by architect Capella Garcia Arquitectura because they are robust and lightweight, as well as being easy to install and cut to size. The panels come in a range of different colours and patterns and also carry the Carbon Trust's carbon reduction label.

formica.eu

4 BRICKWORK WIENERBERGER

Belfast's Stirling Prize shortlisted Metropolitan Arts Centre is one of the city's biggest brick construction projects in recent years. Wienerberger supplied the Mellowed Red Sovereign Stock, a waterstruck style of brick widely used across Ireland. A range of colours are available but architect Hackett Hall McKnight chose this one, which resembles traditional Belfast bricks, to evoke the building's relationship with its surrounding landscape. It has been used externally and for exposed internal finishes.

wienerberger.co.uk



5 VITREOUS ENAMELLED PANELS AJ WELLS

A J Wells has manufactured and installed a dramatic vitreous enamel artwork, *Wrapper*, by Jacqueline Poncelet at Edgware Road Tube station in London. Commissioned by Art on the Underground, it covers 1500m² of a new building and perimeter wall, making it the largest vitreous enamel artwork in Europe. Abstracting patterns and colour from the surrounding built and natural environment, the artwork of more than 700 decorated panels was inspired by the history of the area, its overlapping transport systems, waterways, architecture, communities, and London Underground's colourful Tube map.
ajwells.com

6 CASEMENT WINDOWS TECHNAL

Technal's aluminium casement windows have been selected for a new campus building near Toulouse in France. Around 400 windows, which run the full length of the facade, were specified to fill the College of Bessières building with natural light and create a visual extension of the surrounding woodland. Minimising use of air conditioning in summer and gaining warmth from the sun in winter, the systems feature slim sight lines to reduce reliance on artificial lighting. Windows on the main elevation are shaded from the sun with Douglas Fir *brise soleil*.
technal.co.uk

7 PAVAWALL SYSTEM NBT

Natural Building Technologies' Pavawall panel system has been employed on three low energy houses in the coastal town of St Andrews. The breathable system means the structure can self regulate moisture levels to minimise interstitial condensation. A continuous layer of NBT's high performance woodfibre boards overlays the closed panel timber frame structure, while OSB boards on the internal face of the panels supply racking strength and act as an internal airtight layer. U-values for the clad sections are 0.14 W/m²K and airtightness tests on the properties recorded 4.6m³/hr/m²@50Pa.
natural-building.co.uk/

8 ALUMINIUM FACADE CLADDING SCHUECO

An £8m design, prefabrication and installation contract, won by Schueco UK's network partner M Price, will use Schueco's USC 65 insulated unitised facade system on a 27-storey residential tower at Maple Quays, part of London's Canada Water development. The system combines economy and functionality with the striking aesthetics of continuous, consistently narrow, sight-lines. Over 1,000 unitised sections measuring 2.5m by 3m will be fabricated for the contract, and will be constructed at M Price's factory in Enfield.
schueco.co.uk

Costed

Davis Langdon director and building envelope specialist Stephen Mudie provides an overview of up to date cladding costs

While cladding systems could be categorised as having either mostly glass (curtain walling) or an increased ratio of solid compared to glass, for first principle cost planning purposes, the variables within each category are many, further compounded by project-specific idiosyncrasies, including the aspirational and legislative.

Cost planning cladding is therefore project-specific, simply because of the wide variety of possibilities and project-specific requirements. However for the vast majority of commercially led

projects, the ultimate budget is defined early in the design process, which creates a cost discipline within which the client design and consultant team must work. Far from being a burden, it is a challenge for designers to select the right cladding systems and use them creatively to satisfy project specific requirements, both visual and performance-led – ie Part L of the building regulations.

The cladding cost rate ranges published below are very much order of cost allowances, which attempt to accommodate the diversity of project

types, in terms of size, facade area, different wall types and sectors. For example, residential facades tend to have a much higher solid to glass ratio than say commercial office buildings, which clearly influences system decisions and thus cost.

The rates published include facade contractor design, procurement of raw materials, fabrication, delivery, installation and project management. They offer a realistic starting point for cost planning/design development. The rates do not include professional fees or main contractor costs. ●

SOLID CLADDING

The rain screen options listed here must be added to the substrate allowance below, to realise the total wall build up for cost planning purposes

Substrate allowance including insulation and membranes, eg SFS (structural framing system)	£120-150/m ²
Western red cedar/Siberian larch timber rain screen, including battens, etc	£125-£175/m ²
Pressure laminate board rain screen, eg Trespa, including all rails, brackets, etc	£150-£200/m ²
Powder coated aluminium rain screen, including all rails, brackets, etc	£200-£250/m ²
Natural anodised aluminium rain screen, including all rails, brackets, etc	£225-£275/m ²
Terracotta tile rain screen, including all rails, brackets, etc	£200-£250/m ²
Glazed ceramic tile rain screen, including all rails, brackets, etc	£250-£300/m ²
European dense limestone, assuming 40mm thick German Jura, regular Ashlar detailing, including all rails, brackets, etc	£300-£400/m ²
Portland stone, assuming 70mm thick base bed, regular Ashlar detailing, including all rails, brackets, etc	£500-£600/m ²
Bronze (brass alloy) rain screen panels, including all rails, brackets, etc	£300-£400/m ²

The following do not require a separate substrate, but do require internal stud walling and dry lining (Internal walls element of the cost plan)

Precast concrete panels in reconstituted stone finish (mix of aggregate, sand, cement finish), assuming adequate quantity and good level of repetition, including insulation to rear face of panels	£400-£600/m ²
Grey-back precast concrete panels with natural stone (German Jura) embedded during the production process, including insulation to rear face of panels	£500-£700/m ²
Precast concrete column and beam 'elements' in reconstituted stone finish, installed as single pieces to primary frame columns, including insulation to rear face	£750-£1,000/m

PREDOMINANTLY GLAZED CLADDING (CURTAIN WALLING)

The rain screen options listed opposite can be added to the base curtain wall rates where solid panels are required for 'extra over' cost planning purposes

Capped stick curtain wall, powder coated, double glazed, solar control glass, glass fronted spandrel panels	£350-£400/m ²
Upgrade capped stick curtain wall to flush glazed (SSG) structural silicone glazed	*E/O £50m ²
Captive glazed unitised curtain wall, powder coated, double glazed, solar control glass, glass fronted spandrel panels	£450-£650/m ²
Upgrade captive unitised curtain wall to flush glazed, structural, silicone glazed (SSG) direct bond	E/O £50/m ²
Add solid glass fronted panels within curtain wall for Part L purposes	E/O £100/m ²
Add 250mm projecting natural anodised extruded aluminium vertical shading on 1.5m module (east and west elevations)	E/O £100-£150/m ²
Add 250mm projecting natural anodised extruded aluminium horizontal shading, three per storey height on 1.5m module (south elevation)	E/O £150-£200/m ²
Unitised curtain wall externally ventilated double skin facade, including motorised blinds. Facade depth circa 250mm	£700-£850/m ²
Double glazed bespoke feature glazed wall with point or patch type fixings, assuming stainless steel framing	£900-£1100/m ²
Unitised curtain wall closed cavity double skin facade, including blinds and dry air to manage condensation risk. Facade depth circa 250mm	£700-£850/m ²

Cost additions not included within rates highlighted above

Visual mock-up and performance testing per wall type (static and dynamic in accordance with CWCT criteria)	£100K
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* Extra over

Your vision

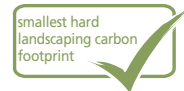


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Moisture in buildings

Making homes airtight to save energy could lead to catastrophic moisture build-up

STEPHEN COUSINS

In the first ever study to track the specific implications of passive indoor drying, researchers from the Glasgow School of Art's Mackintosh Environmental Architecture Research Unit (MEARU) monitored 30 homes – old and new properties – and found that a typical load of washing released around two litres of moisture into the air. And when clothes were dried in ill-ventilated rooms – the norm in most homes studied – the conditions allowed mould and spores to grow and dust mites to thrive, contributing to symptoms of asthma or eczema.

The results have serious implications for low carbon buildings, which depend on high levels of air tightness to maintain energy efficiency – open a window to purge extra moisture from washing and you compromise a home's airtight skin, but a vented tumble dryer increases energy use. The situation is aggravated by the building regulations, says MEARU, which give too loose a definition of 'drying space' provision, meaning in many homes no more than a washing line over a bath.

When first reported by BD, the story was met with bemusement by architects commenting on the magazine's online blog, but the MEARU research forms part of an increasing body of evidence on the worrying impact that moisture is having on energy efficient new build and sustainable refurbished properties. Poorly executed details for insulation, vapour barriers and other components are creating high levels of condensation; in Passivhaus-designed homes airflow vents are being left out by construction teams, drastically reducing ventilation rates; and installation errors on mechanical ventilation and heat recovery (MVHR) units, essential to moisture removal in airtight homes, are causing problems with high humidity and air quality.

When it comes to constructing sustainably, 'built tight, ventilate right' should be the mantra, but projects rarely take this holistic approach, explains Russell Smith, MD of domestic retrofit specialist Parity Projects: 'Moisture and ventilation is a massively important issue, which is not being dealt with properly in the UK. The way the industry is set up, individuals focus on a specific measure



Top: All that glitters... Passivhaus that was the study for the Leuven University study.

Above: Poor interfacing resulted in moisture penetration.

– windows, plumbing etc, but no one has an overarching view of how they should fit together or the impact of one on the other. This will have major implications for the Green Deal, as providers are not trained to assess properties holistically,' he says.

PASSIVHAUS PROBLEMS

Researchers at Belgium's University of Leuven have uncovered a plethora of moisture-related problems in the country's Passivhaus properties, one of which was so badly affected it had to be condemned, its occupants suffering from allergies, excessive tiredness, coughing and itching skin.

The University's research into the newly-built property revealed problems with the earth pipe, designed to draw warm air from under the house then blow it through the heat recovery unit and into the living room, kitchen, and bedrooms. The pipe wasn't watertight, allowing rain water to enter, and effectively becoming an air humidifier that pumped warm, bacteria-rich moisture into the house.

Among a catalogue of other issues, researchers measured cripplingly low ventilation rates, much lower than standards required in Belgium. This was caused partly by the MVHR system which was not designed to the proper dimensions, and by the contractor's failure to build flow-through openings in internal walls to enable air to move from the inlets to the extractor vents. Hugo Hens, professor at the University, explains: 'When doors were closed it was almost impossible for air to pass from the air inlets to the extractors, causing humidity to rise to unacceptable levels. It's a construction mistake we see again and again,' he says. 'The biggest issue is design teams, who must ensure properties are properly detailed, with the correct wall and window interfaces etc. This is often not done properly in Passivhaus and other energy efficient buildings.'

In the UK, where the market is less developed, MVHR systems are raising similar issues in low energy properties constructed under the Technology Strategy Board's Building Performance Evaluation (BPE) programme.

Air tight buildings often rely on MVHRs to

Below: Interstitial condensation in the PIR insulation of the Belgian Passivhaus.



maintain ventilation rates, but in various testbed projects their ineffective use has led to high humidity levels, says MEARU's Dr Tim Sharpe whose team is monitoring air quality and ventilation in new build sustainable houses in Inverness, Dunoon, Glasgow, Edinburgh and Lockerbie: 'We have concerns over MVHR performance in terms of the design intention, how systems are installed and maintained, and occupants' understanding of the technology,' he says.

A continuing evaluation of Glasgow Housing Association's 'Glasgow House' demonstration

Researchers have uncovered a plethora of moisture-related problems in Passivhaus properties, one of which was so badly affected it had to be condemned

home revealed very low airflow rates with air extracted from the kitchen and bathroom and delivered to the hall, but unable to move into adjacent rooms due to fire protection measures.

The MVHR's flexible ducting had collapsed in some places preventing air from circulating, and the filters had become blocked, but could not be easily changed due to their awkward location. Residents also complained that units were noisy and thought they consume too much energy, so turned them off.

Exceeding performance standards set out in Part L 1A 2006 of the Building Regulations requires a more stringent approach to detailing, focused on reducing heat losses that occur at the junctions between building elements and around openings.

RETROFITS

Although the government is trying to push standard enhanced construction details, the problem is much more complex when retrofitting the existing housing stock, the target of the government's Green Deal. As a result, many problems relating to moisture are only just coming to light, says Bertie Dixon, consulting engineer at Max Fordham. 'With

retrofits the biggest danger relates to internal insulation, which if incorrectly detailed can cause the internal surface of the existing wall under the insulation layer to become much cooler, leading to moisture build up, mould growth and even dry rot.'

If not robustly detailed and taped at the top and bottom the vapour barrier can leak and many occupants fail to understand the dangers of hammering in nails to hang pictures, he adds. English Heritage has also warned that insulating internal walls and reducing ventilation in historic buildings can be damaging if the wrong materials are used as properties need to 'breathe', while the wrong type of insulation can cause damp problems.

Issues in old properties are also compounded without a joined up approach to improving energy efficiency. Parity Projects recently carried out a comprehensive energy assessment of a 1930s-built semi-detached property and recommended 25 different modifications. But the specifier went ahead with only two of them, a boiler replacement and some draught proofing, so the entire house was taken over by condensation. The walls were black with mould and wallpaper peeled off.

If the same piecemeal approach is applied under the Green Deal and similar schemes, the country will be overrun with problem properties, says Parity's Russell Smith: 'The bottom line is that under the Green Deal there's not one central person responsible for considering the entire system – for example no part of the industry has considered the fact we should be installing extra ventilation measures at the same time as insulation,' he says.

CO-ORDINATED APPROACHES

In an effort to tackle the problem, Parity is working with the RIBA on creating the new architect's role of retrofit co-ordinator, which would see individuals trained to make informed decisions on how different retrofitted elements affect a home. 'It's what Green Deal providers should already be doing, but they don't understand the implications,' he says.

If problems caused by moisture reveal a tension between efforts to make buildings more airtight and the need to increase ventilation rates, then perhaps designing homes with an holistic energy efficiency strategy can help restore some form of balance between the two. In the meantime, organisations continue to research into the effects of moisture. These include the BRE, which is measuring humidity and interstitial condensation in buildings as part of the BPE project, with data expected later in 2013; and English Heritage, which is carrying out site and ongoing lab-based investigations into the thermal performance and hydrothermal behaviour of traditional buildings. ●

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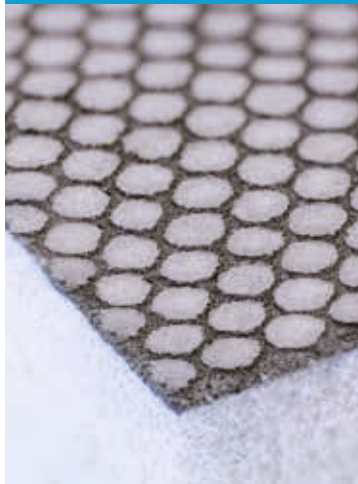
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Broadcasting House Phase 2

Main image: Matching and improving windows from phase 1 included concentrated work on the sill details.
Below: The delicate metal-framed windows of the 1931 Broadcasting House on Portland Place with the extension beyond.

ELEANOR YOUNG

The handsome windows on phase 2 of the BBC's Broadcasting House project in central London were the result of much discussion. But with 24 window types (not to mention 39 sorts of cladding), that's hardly surprising.

When architect Sheppard Robson inherited the project it kept the external envelope, which had planning, but used designs from MacCormac Jamieson Prichard and the visualisations to work up the details. Weekly meetings with Schneider Facades dealt with air tightness, waterproofing and visual aspects, with the hearty use of a fat red pen.

The challenge was to match window types in phase 1 – but also to improve their performance. Helpfully, Whitby Bird remained as facade consultant throughout. Water dripping down the face of the glass and staining the Portland stone below had proved a problem so Sheppard Robson had developed a sill detail to get over it, with clip in flashings. There were certain material changes – mostly visible stainless steel screws being replaced by black headed ones, but also, hidden away, a stainless steel bracket converting to galvanised steel.

The projecting ribbon windows have been turned into single, prefabricated units which fit in from slab to slab rather than relying on wet trades for drylining, airtightness and insulation.

The BBC attracts certain issues: security was a driving force for the whole of the envelope, including the rank of slim Boon Edam revolving doors which sit under the curving glass facade of the 'cyclorama'. In the home of British broadcasting acoustics might also be expected to play some part: live broadcasting studios alongside the facade are all structurally isolated from it, with an additional layer of windows. So it was meeting rooms alongside busy roads, or in one case suspended in a bridge, that raised acoustic attenuation requirements which were between 38dB and 50dB.

Perhaps the window that will get the most public attention is that on the ground floor of the now-pedestrianised street in front of the entrance. But people peering through the glass here are more likely to be staring through to the screens and reception of the BBC than examining the details. ●



SIMON KENNEDY

MAIK PINKERT
TECHNICAL DIRECTOR,
SCHNEIDER FASSADEN

'This project took a lot of technical resource,' explains Maik Pinkert, technical director, Schneider Fassaden. He is used to architects wanting their own bespoke profiles rather than those from a catalogue – Schneider has its own factories in Germany and Poland which can assemble anything from steel to timber windows. The challenges on Broadcasting House concerned the scale and variety of the units. The prefabricated windows had their own issues. 'They were very big, heavy units and the heavy glass pane meant there were structural issues,' says Pinkert.

Hurlingham Club swimming pool

Main image: Between wall and overhanging roof is the clerestory, bringing in light without compromising privacy.
Below: Developing roof and window together gave CSI the confidence to detail delicately.

Members of London's exclusive Hurlingham Club were inordinately fond of their old pool pavilion. Bright blue and punctuated with modest white doors it spelled summer. Standing inside the changing rooms, Andy Mytom of David Morley Architects could see another attraction: a view out under the roof towards the green landscape beyond.

So right from the start a clerestory window, combining views and privacy, was critical to the design. And on the base of the pavilion, new white doors designed by Morleys and manufactured by Key Joinery of Derby, lift the blue box. Above window level the project was put together by Commercial Systems International. As a subcontractor it also managed the interface and detail between the glass and structural roof. Slots were left in the roof for the glazing both for partitions and the clerestory.

Overlooking the pool are 20 fixed double glazed windows, with 53 Ideal-Combi aluminium composite windows at the back. The ventilation strategy, vital in wet changing rooms, was critical. Here 'beach hut' doors come into their own – and not just aesthetically. With vents and manual attenuation air is drawn through the space and out through the back windows which have Window Master WMX 802 actuators integrated in the timber section.

Members' comfort was always critical. Double glazing and background heating take the chill off for early morning bathers and reduce condensation build-up. ●



DAVID MORLEY ARCHITECTS.

MAARTEN KLEINHOUT

CONTRACTS MANAGER AND DESIGNER,
COMMERCIAL SYSTEMS INTERNATIONAL

Contracts manager and designer of Commercial Systems International, Maarten Kleinhout, has seen its cladding business move increasingly towards creating bespoke products for Grimshaw and other big name architects. 'There is always some prototyping and sampling and we're quite quick to get a new design and turn it into something physical,' he explains.

On Hurlingham, the glazing was a minor element but as a subcontractor for the roof as well CSI could dovetail how it all worked together. 'We knew how the wood and the glass would move both now and in the future and could detail for that,' he says. Using two separate packages would have meant each party had to protect its own works and would have resulted in a much clumsier detail, he believes. 'The beauty of the interface between glazing and radiating beams is down to the capacity to hone the elements in tandem,' says Kleinhout.

Warm-edged spacers were used throughout the scheme to reduce cold bridging and the chance of condensation. Of course, there were elements where CSI wasn't a critical part of the chain. The aluminium composite windows at the back 'anyone could have done', he says.



Finchley Memorial Hospital

Main image: Shading and privacy were critical on the upper floor windows. Below: A mock up allowed the end users to test the vent and window combination.

One of the problems with healthcare buildings is that windows are not allowed to open more than 100mm. 'Getting in enough air for natural ventilation is tricky with this restriction,' says Marc Levinson of Murphy Philipps Architects. The window restrictors are intended to reduce the problem of break ins at ground floor and suicide above. 'The thing is the guidelines from Health Technical Memorandum 55 suggest that the openings should be decided on a case by case basis, but people are very risk averse,' he says.

To bring in extra air more, smaller windows are often used. But that takes a lot of little bits: openers, frames, handles etc. On its Finchley Memorial Hospital in Barnet Levinson got round this with a louvred venting panel. Three Reynaers Aluminium opening windows (with restrictors) sit alongside the vent. The louvres make it secure and give plenty of 100mm gaps to draw in air. After a mock up for the hospital to test robustness the whole lot was pre-assembled by package subcontractor Deepdale.

On the first floor it was felt that, for patient comfort, bedrooms needed supplementary mechanical ventilation, so there are no vents. But without the building overhang that keeps the ground floor cool in the height of summer, shading was critical. Bespoke brises soleil were designed to make the most of the sun while avoiding overheating. Solid aluminium side panels keep the glare out of the eyes recumbent patients.

Levinson sees this window and venting arrangement as part of an evolution towards a different system. 'I suppose we are moving towards the separation of daylighting and ventilation,' Levinson says. 'Instead of glass divided up into three windows you could have a nice clear area.' ●



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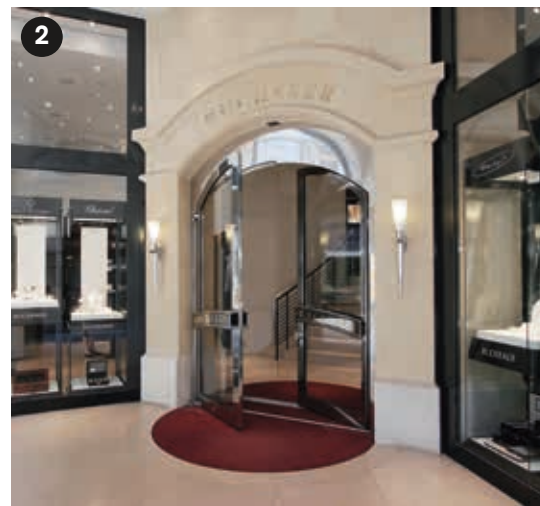
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Bearing the motto 'A view, not a window', Sky-Frame is a frameless, thermally insulated fixed glass and sliding window system that allows architects to use glass from floor to ceiling and wall to wall. The award-winning system, from R&G Metallbau of Switzerland, consists of 30mm thick panes of insulated glass mounted in a glass-fibre profile. This can create large windows and sliding doors up to 4m high, with sliding elements of up to 8m². On request, they can also be operated remotely by pushbutton with hardly a sound. With light incidence of 98 percent, Sky-Frame ensures spaces are flooded with light.

sky-frame.ch

2 UNDERFLOOR OPERATOR TORMAX

Creating a prestigious entrance to a jewellery shop in Basel, Switzerland, the advanced Tormax iMotion 1401 automatic operator is concealed below the floor. The mechanism invisibly ensures smooth opening and closing of new or existing swing doors. The latest technology and a high torque synchronous motor that has none of the parts that generally wear out give the system longevity, exceptional reliability and low energy operation. Sensors allow doors to be set for 'reduced opening' but automatically adapt when pedestrian traffic builds up from both directions.

tormax.co.uk

3 DOOR CONTROL SYSTEMS GEZE UK

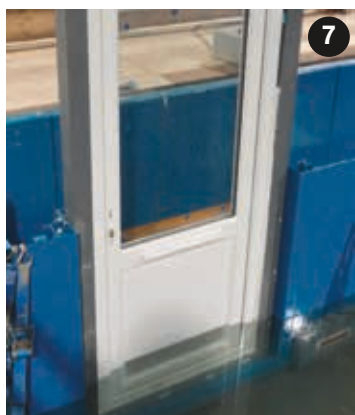
Geze UK, manufacturer of door and window control systems, came up with an ingenious solution for the entrance to Grade II listed 1 Finsbury Circus. The company specified its Slimdrive SCR to operate the circular automatic sliding glass doors which had been chosen to complement the building's ornate wooden lobby and geometric floor. Unable to dig into the listed steel floor it made a 15mm thick stainless steel ring which was machined onto the floor and surface-mounted all the fixtures.

geze.co.uk

4 NEO ROOFLIGHT ROOFLIGHT COMPANY

The owner of a new home, wanting a light and spacious feel, asked the Rooflight Company to replace the property's rooflights to allow more light into the upstairs rooms. Nine Neo S8 and three Neo S7 rooflights with a mixture of manual and motorised options were used, while the homeowner worked with the builder to ensure the roof was adapted to support the new specification. Designed to create a frameless appearance both internally and externally, Neo comes in 15 standard sizes and has a bespoke option.

therooflightcompany.co.uk



5 MODULAR SKYLIGHT VELUX

Velux has moved into the commercial skylight market, launching its Modular Skylight in close co-operation with architect Foster + Partners. The energy-efficient skylight was launched at the Fosters-designed 'Gherkin' at 30 St Mary Axe in London. The skylight is an off-the-shelf product and its modular design means it is delivered to site ready to install, complete with flashings, controls and blinds. But it is also flexible enough to be used for different building types, including schools, hospitals and offices. velux.co.uk

6 STEEL-FRAMED SCREENS WEST LEIGH

Great Western Studios, a hub for creative businesses in Westminster, London, has been fitted out with steel-framed screens on three floors and in a three-storey fully glazed atrium, by window specialist West Leigh. The main design drivers were to maximise light and create a strong industrial identity. Measuring up to 8m long and 2.4m tall, the screens were fabricated in 1m-wide sections and joined on site using matching steel mullions. A movement joint at the head accommodates potential thermal adjustments. west-leigh.co.uk

7 FLOOD DOOR AQUOBEX

Flood risk and resilience specialist Aquobex has launched ISIS Technology, an integrated safety and inundation system that will be incorporated into the design of all of the company's commercial and domestic door products. ISIS Technology is based on the company's newly patented inundation system. The doors are aesthetically pleasing and, to the untrained eye, give no indication of being a flood door. The company says the system ensures minimum damage to a property regardless of the height and duration of the flood. aquobex.com

8 LOW-TEMPERATURE DOOR DORMA

When Sweden's IceHotel needed a glass door and an automatic swing door operator that would function at -8°C, it turned to Dorma. Unlike traditional swing doors whose hydraulic fluid is affected by sub-zero temperatures, Dorma's ED 100 door closer is equipped with a multi stage gear, requiring only a small amount of high performance grease to continue to function in extreme cold. The door is equipped with Dorma wind-load control and its integrated initial drive control (IDC) ensures functional stability by detecting and compensating for any irregularities in its performance. dorma-uk.co.uk

RODECA HELPING LICA WIN A BREEAM OUTSTANDING RATING

Lancaster Institute for the Contemporary Arts (LICA) is covered almost entirely by Rodeca's polycarbonate panels. Recyclable translucent cladding helped LICA become the first higher education building to achieve a BREEAM Outstanding rating. In some areas the rainscreen cladding was trebled to form the whole external wall. The 500mm-wide panels have a tongue and groove coupling and are fixed with steel fasteners.

www.rodeca.co.uk

TRESPA STUDENT ACCOMMODATION MAKES A STATEMENT

Good design starts with inspiration, vision and provocative thinking. It comes to life with great materials, finishes and systems. Trespa Meteor brings compelling aesthetic and nearly limitless design possibilities with various colours, rhythms and depths to next-generation architectural claddings. The panels can be used alone or with other materials to create facades or highlights. Where concept meets solution, you'll find Trespa Meteor.

www.trespa.com

DURA ESSEX'S ECO-FRIENDLY BUSINESS PARK

Two eco-friendly Essex companies have teamed up to build the sustainable business park of the future. Clacton-based Dura Composites is supplying Dura Cladding for Lanswood Ltd's Lanswoodpark project near Colchester. The 87% recycled wood plastic composite cladding is a main feature of the two-storey office, which is designed to be as environmentally-sound and sustainable as possible.

www.duracomposites.com

BENCHMARK TOP MARKS AT BARNSELY'S ALC

The clean lines and subtle textures offered by Benchmark Cement Fibre Facade Systems have been used at the new Holy Trinity Advanced Learning Centre (ALC) in Barnsley, matching contemporary design with low maintenance performance. AHMM specified over 1100m² of the engineered systems, which were developed in partnership with Marley Eternit, for the sports building and performance hall at the ALC.

www.kingspanbenchmark.com

CAREA FINISHING TOUCH TO SUSTAINABLE DEVELOPMENT

Architect Stock Wolstencroft specified 14mm low pressure Acantha cladding for a mixed-use development in east London, to help meet its sustainability targets and give a stunning exterior finish. The Carea cladding, manufactured from a cutting edge exclusive composite, was installed by OCL Facades. Offering a high degree of insulation, the Acantha panels will boost the building's thermal efficiency.

www.carea.uk.com

ANCON THERMALLY EFFICIENT WALL TIE FOR 150MM CAVITIES

Ancon is the first UK wall tie manufacturer to offer a Type 2 stainless steel wire tie for insulated cavities up to 150mm wide. The Staifix RT2 275mm wall tie was designed to meet the growing demand for wider insulated wall cavities in multi-storey buildings, as thermal performance requirements increase. It is suitable for buildings up to 15m high as standard, and taller structures subject to calculation.

www.ancon.co.uk

STOAKES SYSTEMS TRANSLUCENT INSULATION

This is the William Penn Leisure Centre, designed by Atkins. The dramatic daylight diffusing cladding is Kalwall, insulated with integral Lumira aerogel (previously Nanogel) within the panels to give a U-value of 0.28W/m²K. This is equivalent to a solid wall and is probably the best insulating performance of any translucent system. Highly insulating Kalwall is also specified for refurbishment of old cladding, failed curtain-walling and skylighting.

www.stoakes.co.uk

STENI NATURE PANELS

Some 600m² of Steni's sparkling white Nature panels have been used as a rainscreen system at the operationally zero-carbon myplace youth centre in the London borough of Havering. The panels, which are made of a fibreglass-reinforced polymer composite with a surface of aggregated natural stones were chosen for the £4m project due to their durability, speed of installation and ability to be easily replaced.

www.steni.co.uk

MUMFORD & WOOD ON THE MENU AT STYLISH COLBERT

Replacement windows by award-winning Mumford & Wood, specialist manufacturer of timber windows, doors and garden rooms, have been specified in the refurbishment of Colbert in Sloane Square on the Cadogan Estate. High performance hardwood box sash windows from the Conservation™ range were used, which carry BSI Energy Ratings 'A – C', Kitemark and Energy Saving Trust accreditations. www.mumfordwood.com

BOOTH MULTI-PURPOSE STEEL DOOR RANGE LAUNCHED

Booth Industries has launched a new range of multi-purpose steel doors to the architectural market. The 'Premium' door series provides fire and blast resistance, security provision and sound attenuation. Phase one of the 'Transforming the Tate' project, on the south bank of the River Thames in London, recently saw 22 of Booth's Premium doors installed. www.booth-industries.co.uk

FGC SLIDING DOORS OFFER FRAMELESS VIEWS

A sliding door that dispenses with vertical mullions admits maximum light and gives totally uninterrupted views outside. The Clearline range, from Frameless Glass Curtains Ltd (FGC), has a PVC bubble gasket between the panes, which is compressed when the closing mechanism is activated and becomes all but invisible, giving them high levels of visibility, security, sound-proofing and weather-tightness. www.framelessglazing.co.uk

CRITTALL RIGHT FORMULA FOR SCIENCE MUSEUM

Crittall was recently appointed to replace windows on the Science Museum, London. The job included applying Enduroshield transparent coating to the glass for the very large top hung fixed light Corporate 2000 profiles. Double glazed, the centre pane of the glazing achieves the required U value of 1.2w/m²K for compliance with Part L of the Building Regulations, with Low E glass on the inside to control heat gain. www.crittall-windows.co.uk

ATB ANTI VANDAL HORIZONTAL SLIDER

ATB Secure, part of ATB Systems, has added the Taurus Max Horizontal Slider to its range of enhanced security windows. The aluminium slider window, complete with anti-vandal mesh, is ideal for applications where space can be tight and other window openings would cause an obstruction, and where high security is essential. The glass protection mesh is integrated into the extrusion of the window profile, giving a robust anti-vandal barrier. www.atbsecuritywindows.co.uk

FAKRO BEST U-VALUE YET

Fakro GB has launched a roof window with exceptional insulation properties. With a U-value of 0.58 W/m²K, the Fakro FTT U8 Thermo quadruple-glazed roof window is the most energy-efficient available. Its airtight construction uses flexible thermoplastic elastomer seals and warm spacers between panes to reduce the risk of thermal bridging. www.fakro.co.uk

GEZE TOP MARKS FOR INTEGRATED APPROACH

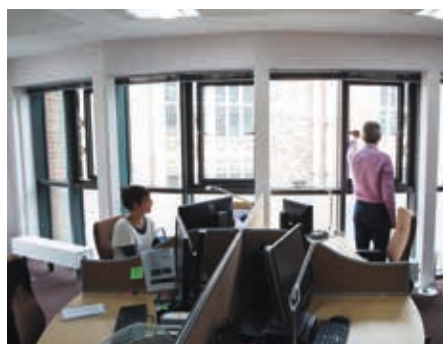
Geze UK is opening doors for wheelchair-bound students at the specialist Treloar School and College in Hampshire. The firm's Slimdrive SF door operators have been integrated with a special access control system, which means that proximity tags fitted in the wheelchairs pre-trigger the radar on each automatic door, opening it as the user approaches. Folding doors maximise the opening width of each entrance. www.geze.co.uk

COMAR 7P.i FOLDING SLIDING DOOR SYSTEM

Comar Architectural Aluminium Systems has launched the thermally broken Comar 7P.i folding sliding door (FSD). Comar 7P.i provides a versatile moveable wall that admits space and light even in winter, when the glazed facade also insulates the building through its thermal break technology. By merging design features with feature-laden operational gearing from the 7P.i system, a wide range of configurations can be designed. www.comar-alu.co.uk

MAPEI PROMOTING DIVERSITY AND SUSTAINABILITY

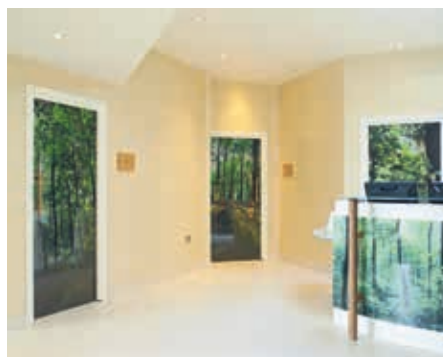
Sealant and adhesive manufacturer Mapei will stress its global and local commitment to the environment at Ecobuild. It will display its 15 manufacturing lines, from ceramic and soft flooring installation products, to the recently launched EW1, and protective and decorative coatings. Waterproofing, concrete and industrial/decorative flooring will also feature, plus its new corporate branding.
Stand N1020
www.mapei.co.uk

SECURISTYLE PARALLEL PLUS FOR EXETER UNIVERSITY

Securistyle's Parallel Plus hinge system has been used at the Mood Disorder Research Centre at Exeter University. The hinge was incorporated into aluminium windows using Smarts aluminium profile, allowing effective ventilation without affecting the building's external aesthetics. Manufactured from high grade 304 stainless steel, the hinge provides a balanced airflow around the entire window opening.
www.securistyle.co.uk

ANCON LOW ENERGY FIXING INNOVATION

2012 Queen's Award winner Ancon will showcase its latest structural fixings at Ecobuild. These include low thermal conductivity cavity wall ties like the Ancon TeploTie, and Staifix RT2 275mm, the first high thermal performance Type 2 stainless steel wall tie to enable 150mm wide insulated cavities in multi-storey low energy construction.
Stand N1110
www.ancon.co.uk

LEADERFLUSH WOODLAND WONDER IN OCKENDEN MANOR SPA

Leaderflush Shapland doors are helping to create a peaceful, luxurious environment at Ockenden Manor Spa in Sussex. Architect John Cooper Associates chose the doorsets to meet the multiple environmental, aesthetic and hygiene requirements of the project. 'The quality of the products is excellent and the service we received throughout was fantastic,' Cooper commented.
www.leaderflushshapland.co.uk

SMART SUSTAINABLE SYSTEMS, SUSTAINABLE FUTURE

Commercial systems specialist Smart Architectural Aluminium will use Ecobuild to unveil its drive to become a carbon neutral business including plans to be energy self-sufficient. The firm will also showcase new systems, with the stand sporting a 4m by 6m run of MC600 Smart Wall curtain walling, complete with a new Smart Wall commercial door which is being launched at the show.
Stand N210
www.getsmartonline.co.uk

LINDAB HIGH PERFORMANCE, SUSTAINABLE ROOFING

Lindab's Seamline is a high performance and sustainable standing seam roofing system that offers a low carbon footprint, minimal thermal movement and corrosion resistance. It is virtually maintenance free and long lasting and at the end of its serviceable life, can be fully recycled. Seamline can be fixed down to a pitch of only 5.7 degrees, sometimes lower, and can be laid up to 15m in one continuous length.
www.lindab.co.uk

GEBERIT NEW GENERATION FLUSHPLATES

Geberit will be exhibiting a new addition to its Sigma10 range of flushplates at Ecobuild. The design incorporates the latest dual flush technology, controlled via infra-red, and has been styled for the next generation. The firm will also show its modernised existing Sigma 10 series and Sigma50 flushplates, and enhancements to other key product lines.
Stand S349
www.geberit.co.uk

NORA AWARD WINNING SUSTAINABLE RUBBER FLOORING

Noraplan sentica rubber flooring from nora systems has won the prestigious gold Nightingale design award from the US healthcare industry. Available in 38 colours and with strong environmental credentials, noraplan sentica won the 'Resilient floor covering' category. Judges praised its quality, functionality, wear resistance, design, sustainability properties and an excellent cost to performance ratio.
www.nora.com/uk

CROWN PAINTS HISTORIC SHADES WITH FLAME PROTECTION



Crown Trade's Timonox Flame Retardant Coatings can be specified for some of the shades in its Historic Colours collection. Timonox works by limiting the oxygen around the flames through the release of non-combustible gases, and provides a barrier to flammable paint layers or substrates beneath. The combination achieves an authentic look for period properties while also giving them fire protection.

www.crowntrade.co.uk

LAUFEN PALOMBA COLLECTION GOES BACK TO NATURE



Laufen, the Swiss manufacturer of luxurious bathrooms, has again teamed up with Roberto and Ludovica Palomba to add several new statement pieces into its Palomba collection. The 2012 Collection features soft lines that look as if they had been fashioned by water. It includes a bath, eight basins and co-ordinating accessories, with pieces designed to be mixed and matched to achieve a truly individual look.

www.laufen.co.uk

RADA RADA HELPS REFURBISH WORLD-LEADING CANCER CENTRE



Commercial showering and washroom control specialist Rada has supplied its healthcare approved products for refurbished cancer centre The Christie, in Manchester, UK. Rada Sense and Rada ACU concealed digital mixing valves and showers, basins and spouts have been installed. Rada's Buildcert TMV3-approved Rada Sense concealed digital mixing valve range helpfully offers non-touch controls.

www.radacontrols.com

BAGNO DESIGN WATCH TV WHILE YOU SHAVE



The Bagnovision mirror TV range from Bagno Design incorporates a 19in high density television in the bathroom mirror. Complete with Bluetooth technology and AV Media, the TV also has a waterproof remote, passive speakers and an FM/AM radio. Mist free mirror pads can be fitted as an optional extra.

www.bagnodesigns.co.uk

NORBORD CABERDEK PICKED FOR MAJOR ABERDEEN DEVELOPMENT



Norbord's flagship particleboard flooring product, Caberdek, is being installed throughout a major new residential scheme in Aberdeen. Cala Homes has specified the Caberdek for all suspended floors on the Hilton Campus. Made in 18mm and 22mm thicknesses, the premium flooring panel combines Norbord's moisture-resistant P5 particleboard with a tough, non-slip protective film.

www.norbord.co.uk

MARSHALL TUFFLEX QUICK AND EASY TRUNKING INSTALLATIONS



Marshall-Tufflex has a solution for any trunking project, with the largest range and some of the easiest systems to fit. To simplify specification it has produced 'We've Got it Covered', a mini-brochure outlining its most popular PVC-U multi-compartment perimeter trunking options, detailing size, ideal installations, technical data and images. It includes the all-curved Odyssey, Twin Plus, Twin165 and Sterling profiles.

www.marshall-tufflex.com/

GEBERIT NEW COLOUR, SAME INNOVATIVE CONVERSION OPTIONS



Geberit's Monolith module is now available in a new Umbra colourway. For washbasins, WCs and bidets, the module allows conversion from freestanding to wall-hung sanitaryware can be carried out easily as a retro-fit project, rather than having to redesign the entire bathroom. With fixtures and fittings concealed behind the elegant, slimline umbra glass surface, the Monolith creates a streamlined, clutter-free look in any space.

www.geberit.co.uk

PLANET PARTITIONING PLANET LANDS IN ABERDEEN UNI LIBRARY



Planet Partitioning, the UK's largest independent partitioning specialist, has installed its Advanced Frameless Glazing in the new library at the University of Aberdeen. Single and double-glazed frameless partitioning with the award-winning Solar joint was used throughout the project; translucent dry-joints are virtually invisible, allowing the creation of seamless walls of glass for a stunning and contemporary visual effect.

www.planetpartitioning.co.uk

Sign Up

BRIAN GREATHEAD DIRECTOR AT MANALO & WHITE ARCHITECTS, GIVES US THREE OF HIS SPECIFICATION FAVOURITES



WISA SPRUCE PLYWOOD

We often work with inexpensive products as finishing materials. WISA Spruce Plywood is sustainably sourced, relatively light and readily available. The knots are regular in appearance because of the rotary cut nature of the ply laminates. This makes it look alive without a distracting amount of variation between panels when used to clad a wall – when we needed to fit plywood for racking strength to the interior of Seabank Cottage in Norfolk we left the WISA Spruce exposed. We experimented with stain finishes and found that an Osmo Natural Oil Woodstain in white enhanced the figuration when wiped off as it bites more into light summer than dark winter growth, accentuating the grain while lightening the colour. It also reduces 'gingering' of the softwood over time.
Manufacturer: UPM-Kymmene (UK) Ltd



TINTED MIRROR

This differs from a conventional 6mm silvered mirror only in that the glass is through coloured, yet it has amazing transformative properties. It comes in green, blue, grey, peach and bronze. Used in small quantities reflections seem subtly tinted, but it really comes to life when used in large areas. Golden peach panels en-masse suffuse the space – warming and enriching the light in the room, and multiplying the effect if the mirror reflects itself. The dark grey finish is serious and sober, lending depth to the space without obviously being a mirrored surface. We are working on the new Focal Point Gallery in Southend where the exterior face of the office and project space is 3m high bronze mirror panels, colouring the otherwise grey plaza when the morning sun bounces off it.
Supplier: Glass Designs



LINOLEUM

Lino is cheap, wears well and is defiantly old fashioned. Generally architects play safe and specify plain colours but this misses its inherent beauty. The combination of natural materials and large scale industrial processing give the sheets a distinctive grain without repeats. Disparate colour flecks can look like vomit on a tiny swatch but when seen at a larger scale they blend to form a strong backdrop that can tie together a varied interior scheme – we have used Artoleum Piano and Mineral ranges to great effect. We are keen to develop the use of lino and are working with Forbo on a gallery scheme for Artworks MK in Milton Keynes with the intention of using variants of Marmoleum on the floor, on furniture and even in pinboard form on the walls.
Manufacturer: Forbo

...Sign Off

JAN-CARLOS KUCHAREK ENJOYS THREE OF THIS ISSUE'S OUT-TAKES



OVAH AND OUT

Is there anywhere in London that you can't see Rafael Viñoly's new Fenchurch St tower from? True to its Walkie Talkie nickname, it's broadcasting itself visually to every protected view cone in the city. Last week I saw it from the top of Primrose Hill where it sat bulkily against the sunrise like a stone tablet of truly biblical proportions – with the emphasis on the 'Thou shalt not...' Consoling, the behemoth will be powered by a 300kW stationary fuel cell from energy systems provider Logan Energy. Using electrochemical reaction rather than combustion, the electricity created is virtually free of pollutant emissions, and can achieve up to 90% efficiency when set up as part of a CHP configuration. So while the building stamps across the London skyline in the architectural equivalent of hobnail boots, at least its carbon footprint will be as a ballet pump en pointe.



ON THE BOX

Someone should give Eddie Stobart a knighthood – or the Stirling Prize. If the UK's haulage provider of choice knew how versatile his containers would be, he could well have had the construction market cornered. Never mind pop-up shops in Shoreditch and Trinity Buoy Wharfs in east London's docks, now those corrugated boxes have surfaced for family brewer Hall and Woodhouse's new £2.4m Portishead boutique hotel. Architect Mackenzie Wheeler thought recycled shipping containers were perfect for a hotel facing over the Bristol Channel, referencing the site's past and giving it a 'wow-factor.' H&W is on a winning streak – its Bath hotel was recently named by the Mail on Sunday as 'one of the six places you should see when visiting Bath'. One hopes this observation doesn't leave John Woods the Elder and Younger turning in their own subterranean little boxes...



STONE ME

Kids' play equipment supplier Timberplay has produced 'Seating Stones', Brobdingnagian pebbles made of glass fibre concrete. They are very hardwearing but quite light – a slightly disconcerting concept, but bear with. Available in three stoney colours, the press release states that they can be used both outdoors and indoors, although quite where you might put an internal boulder they don't say – I mean, you can hardly sit the TV on one. The release goes on to state that the 1.6m-2.4m diameter pebbles are 'great seating solutions that have high play value while being a good sensory addition to any space.' No doubt; if 'stone cold' and 'hard as rock' are the sensory experiences you're after. Still, the last word on comfort will probably come from the homeless, who in search of a good night's sleep, will be rolling around on these like a baby on a blanket.

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DAYLIGHT!



THROUGH CRITTALL METAL WINDOWS

Picture shows original artwork for Crittall poster and advertising material circa 1930

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