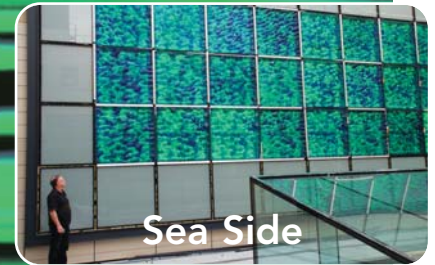


roadcast

Winter 2010



Bagging Benefit

Motor sport, aviation and marine specialists all voted reusable silicone vacuum bags an instant hit on Bentley's stand at the recent Composites Engineering Show.

War Worlds

To describe Games Workshop as a company that manufactures tabletop wargames is a bit like describing Disney as a cartoonist – it's technically correct, but a bit short of the mark. The company is a classic example of everything that is good about entrepreneurial niche manufacturing – something that Britain still excels at.

Bentley Chemicals has been working closely with Games Workshop for a number of years and more recently the relationship has developed into a very effective strategic alliance, focused on continuous process improvement. This has impacted the materials Games Workshop use, their production processes, and the training of staff in new techniques.

The company has been in the business of "the best model soldiers in the world" for over 30 years. This embraces collecting, modelling, painting and tabletop gaming with entire armies. It appeals to all ages and once



Young and old enjoying the facilities at Games Workshop's HQ

immersed in the culture, the participant is exposed to another dimension of strategy, books, videos and tournaments.

The staggering array of different armies and their respective war worlds are manufactured by either injection moulding, centrifugal metal casting or by resin casting. Bentley Chemicals has

been supplying resins and silicones to the company for a number of years and a recent steady growth in the production of models made from resin has emphasised the need for ever more efficient methods of production, in line with Games Workshop's philosophy of continuous improvement.

Over the last two years in particular, the technical team from Bentley has worked with the company to help them seamlessly evolve their production. This has covered a wide spectrum of input - the introduction of new moulding silicones; a change from block moulds to skin moulds in some areas; new mould release techniques and the development of tailored moulding processes.

"We have worked very closely with Bentley and it's been a joint learning curve," commented Terry



A model before painting

Whetton from Games Workshop, "they are helping us to introduce some significant changes which are making a very positive contribution towards our improvement processes. It's been very welcome and has required a completely open and honest relationship in order for it to work." The alliance has required Bentley to take a strategic view of the relationship. In the short-term, helping them to improve their production efficiencies actually reduced the volumes of raw materials that Bentley were supplying. But it was the future growth potential



Showcasing just some of the history at the HQ

Head Start

that was always the key driver. "Relationships are the building blocks of our business," commented Rob Price from Bentley's technical team, "our motivation is to help our clients become even more successful, and we still like a tough technical challenge to overcome – it brings out the best in us!"

Anyone who has ever visited the Nottingham headquarters of Games Workshop will have had exposure to the fantasy world experience. Not only can you bring your own army and hire themed sets to play out your strategies in a large war room, but you can also visit the museum of miniatures and even enjoy refreshments in a suitably atmospheric leisure area.

The site has about 600 staff with approximately 150 people involved in the production of the miniatures, including the major brands of Warhammer and Warhammer 40,000. Sales are made through Games Workshop Centres, independent retailers and also direct - 70% of sales come from outside the UK.

Today, there are literally millions of gamers around the world – all from a very humble start with three "game fanatics" selling handmade wooden games from home in London. And yes, as befits the best war fantasy, the strategy is one of total world domination – to have Games Workshop in each of the world's major economies.

Carmen Bowers is a self-employed teacher whose use of the creative arts, in particular sculpture, has seen her directly help people who normally have difficulty engaging with

apply her ideas later at the front line of education.

As she developed her creative arts lessons, Carmen began encouraging her students to sculpt heads out of clay - the response

idea into a Category C prison where the students quickly responded with enthusiasm. One of the inmate's creations was so good that it subsequently won a prestigious arts prize. As the idea was



Clay head taking shape

traditional forms of education. She has worked with excluded youngsters, people with disabilities and even Category C prisoners.

She has recently introduced a creative and unique "educational tool" that is already being used in schools close to her base in Devon, and she is now planning for a wider take-up of her highly effective idea. Her early interest in sculpture had led Carmen to share a workshop with an experienced craftsman doing restoration work for the National Trust, and over a period of time, through tuition and observation, she acquired the skills of cement sculpture. This grounding was to help her

was encouraging. She quickly realised that what she needed to make the process much easier was a reusable armature for the students to use as a formative base for their sculpted heads.

She took her initial armature



The armature base

progressed, Bentley Chemicals became involved supplying materials such as plaster, foams and RTV silicone, to help Carmen improve the end quality of the armature.

Carmen soon sold it into 15 local schools as a reusable resource, complete with a training DVD. So far her youngest convert to the tool has been 5 and the oldest 84! At the moment she is still working as a self-employed teacher 4 days a week, but she is keeping one eye on the growing interest in her idea as it continues to help those that are often excluded on our fringes.

Liverpool Likeness



The original fragment

The Conservation Technologies department of National Museums Liverpool has a well established track record of providing high quality replicas for a large number of organisations. This year, Bentley has begun providing the department with a range of moulding and casting products. Everything from bones and stones, to Anglo-Saxon artefacts are the order of the day for the

department, and one recent project which used Bentley's materials was typical – producing a reconstruction of a five-foot high Viking cross. The story began when fragments from several Viking crosses were discovered at a church in Neston, on the Wirral - St Mary's and St Helen's. As local interest and enthusiasm grew, the Grosvenor Museum in Chester became involved and called in the

Conservation Technologies department from Liverpool to produce a full-sized reconstruction of a Viking cross for a forthcoming exhibition.

The next contributor to the project was Professor Roger White from Birmingham University, an expert in Viking archaeology and artefacts, who set about determining what the missing pieces of the cross would look like, based on the existing design elements, and also on the designs of other known Viking crosses.

Working from a new complete drawing of the cross, laser scans of the fragment from Neston and an existing cross-head from the same period, technicians from Liverpool produced a 3D digital reconstruction of a complete cross, which was turned into a master pattern by computer controlled machining. Technicians then used urethane rubber and Plasti Paste to mould and

fabricate the reconstruction. Although it was scheduled to make its first appearance at a Viking exhibition at the Grosvenor Museum in Chester, its eventual destination was to be back "home" outside the church at Neston. This meant that the construction had to be both robust and very durable.



Working on the casting

When the casting was eventually completed, it was painted in bright colours true to its Viking heritage and ready for its debut. Once back in its original setting in the Wirral, the bright appearance of the cross will naturally weather and age over time. Until its rebirth is perhaps no more than just a faded memory?

Froth Foam

FROTH-PAK™ is a two component polyurethane spray foam kit which produces foam of exceptional quality, both quickly and easily. It is available either as a portable kit, or as a machine spray system for high volume usage.

It is ideal for a wide variety of applications including film special effects and scenery, marine applications, insulation, void filling, structural support, roofing and sound proofing. It is quick setting, moisture resistant and has high thermal

resistance. It bonds to most surfaces, can be cut and sanded in minutes and little operator training is necessary.

The portable version is an improvement over earlier similar foam spray kits, and features two pressurised tanks connected to an advanced spray gun. It requires no external power source.

The high volume systems come in a range of capacities and are ideal for bulk delivery of foam. Foams are available in various densities to suit



Froth-Pak Kit

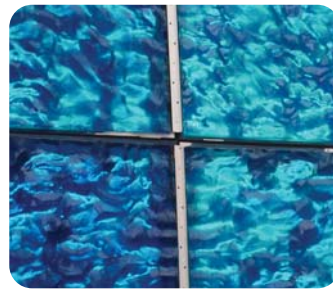
clients' needs and the machines apply a variety of products. The most common is the spray-applied class 1 fire rated G1945 system which delivers around 10 cubic

metres of foam. The machines also apply Polyurea and Hybrid coatings which are ideal for tank linings and floors and are used widely in set construction.

Sea Side

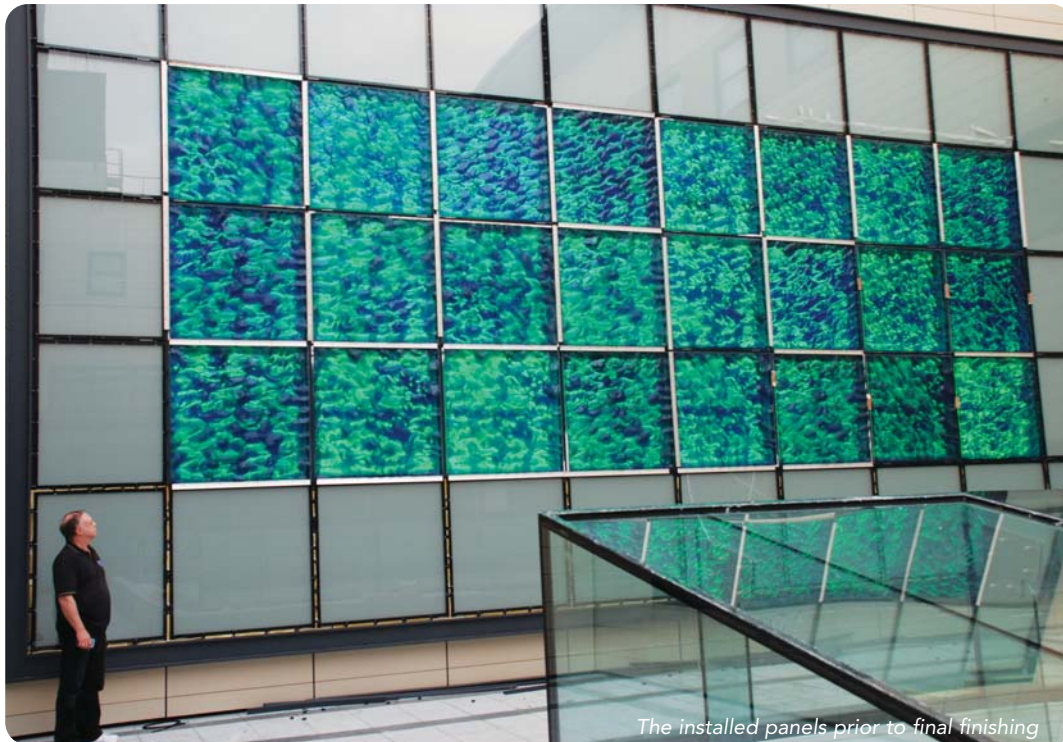
If you've ever walked along a sandy beach at low tide and noticed the rippled pattern that the sea leaves on the sand beneath, you will recognise the inspiration behind a new and unusual work of art that now forms part of a new hospital in Ireland.

The rippled impression was then recast in clay and a silicone mould taken from the clay. But it was the task of creating the clear panels that was the formidable challenge because of the size and weight of each panel, and so Rob Price from Bentley's technical team put Raphael in touch



The ripple effect

was attempted to achieve the first cast. The layered approach wasn't altogether successful so it was agreed that the only option was to



The installed panels prior to final finishing

Raphael Daden describes himself as a light-based artist and he was inspired by the sandy ripples to create a series of panels that would capture the natural wavy pattern but at the same time, project the dynamic blue translucency of the sea. "I wanted to create a calming effect that would work both during the day with natural light, but also at night with sequenced lights."

The end result is a work of art 10 metres by 4 metres made up of 24 panels, each 1.2 metres square and weighing in at 75 kilos. But the whole project began with Raphael on his hands and knees on a beach in Northern Ireland, taking plaster casts of the seabed.

with Longmore Castings in Worcester to help him produce the final piece.

"We've been in the business of specialised creative casting for over 25 years," commented Neil Longmore, "but this project was certainly a challenge and involved the largest castings we had ever attempted." The main hurdle was to ensure that the 24 panels were all very accurately sized and any shrinkage was kept to an absolute minimum so that they could be assembled with very fine tolerances.

The female moulds were created first out of Rhodorsil RTV 4420 silicone rubber, and then a layered pour of Smooth Cast 327

go for one long, continuous pour and then to leave each panel overnight to cure. After a time of trial, error and adjustment, and some additional technical input from Bentley, the process proved successful and the 24 panels were all successfully finished.

The hospital is delighted with the end result and Raphael has now moved onto a project working with neon, but has added Smooth Cast to his portfolio of light-based materials for the future.

www.raphaeldaden.co.uk



Interest in Curetime's Academy goes from strength to strength. The learning modules are proving a real hit with both students and seasoned professionals - "It's what learning should be like" was a comment from one user!

Curetime has been "raising its profile" in universities and colleges in the UK, making students aware of its free learning modules and special discounts. The campaign has been targeted at any course that uses specialised moulding – everything from fashion and make-up, to furniture design.

Students at universities and colleges that register with Curetime can get a 10% discount on all purchases. To find out more email:

contact@curetime.co.uk



F i l m F o c u s

W hittling away at a small piece of wood and discovering that you have a previously unrealised ability to sculpt is an unusual start to any life career - particularly when you are already in your late twenties. But that is precisely what happened to award winning special effects and make-up artist, Davy Jones.

It was on the set of Brookside where he was working in the design department dressing and

followed by a squirrel and then another bird. Having failed A Level Art, it was quite a surprise to discover I could do it!"

Davy soon progressed to making sculptures in clay and set about reproducing models of Yoda, Batman, ET and Terminator - often late into the evening when everyone else had gone home on the set. At that time Lin Davie, who was later to become Davy's wife, was head of the department and she began

being the son of a Liverpool lorry driver, he thought it best to keep his new-found skills a firm secret, just in case his father became "a bit worried about him!" But it was the combination of modelling and make-up that became the foundational platform that allowed him to begin turning his hobby into a job.

The first small breakthrough for Davy's creative talents came from a particularly heart-rending scene in Brookside when, despite his name, Lucky the dog (an established member of the cast) was run over. Davy set about putting together a slightly battered and lifeless Lucky using bits of dismantled toys, and his first on-screen special effect was created. From his first success with Lucky, the next challenge was also a sensitive one - to create a premature baby. Davy used gelatine to give the model a successful life-like appearance and it wasn't long before there was a steady trickle of requests coming in as the word spread around his home patch of Liverpool.

Davy's career at Channel 4 began to grow and he progressed onto working on the soap Hollyoaks. As is often the case with specialist niche skills, most of the acquired knowledge was gained from personal, sharp-end experience. Creativity was usually the only answer to overcoming problems and achieving the desired effects, often against tight deadlines.

Much of the work centred on the gritty and gory end of the spectrum, particularly



Davy's handiwork on Mike from Bentley

working on series like Waterfront Beat and Cops, but after two years of special effects experience with Channel 4 he had decided to go freelance. Colleagues that he had worked with began to independently carve out their own careers in film production and direction, and these relational connections opened up more doors of opportunity working on series like Dr Who and A&E.

"In the early days we were mainly working with latex and various foams to create many of the effects such as corpses or various body parts. The main problem then was that the rubber would leach oil and this



Another bad day at the office?



One of Davy's creations

moving sets and scenery that he made his discovery. "We had a bit of a quiet moment between changes and I just started to carve away on a small piece of wood," commented Davy, "I managed to shape a small bird which was soon

to encourage Davy with his hobby. She even challenged him to a model making competition and the prize was a dinner for two!

Lin also began to teach Davy the basic skills of theatrical make-up, but



The school in Liverpool

made the special effects paint run or smear. We were looking for materials that were more substantial and reliable to work with, and it wasn't until we got new products like platinum cure silicones that we really overcame this." Another of Davy's milestones was getting the opportunity to create Wesley Snipes's memorable tattoos in *Blade 2*. A catalogue of film experience then began to build up, working on productions like *Band of Brothers*, *Pirates of the Caribbean* and *Narnia*.

Increasingly Davy began to use new products from Bentley as they arrived on the market. "Mike Dargan from Bentley has always been really helpful introducing us to a variety of products and their benefits. Ecoflex, Dragon Skin and Shell Shock have not only helped us to broaden out what we could achieve, but they have also made the processes easier."

As well as mainstream film productions, work also continued on major TV series such as *Casualty* and programmes like *Bodies*. As Davy travelled around the country on TV productions he increasingly set up his own on-site workshop to create the effects and he found that there was a steady stream of people interested in his work and

techniques. This stirred an idea to open up his own training school and 2010 has seen him realise this next progressive step in his career.

In conjunction with his wife Lin, the training school is now running courses on special effects prosthetics as well as courses on theatrical make-up. "Being able to work with people who are passionate about the same things as me and help to transfer skills and knowledge is what it is all about. It gives Lin and me a real buzz to know that we are sowing into the future of our industry."

Davy has recently been working on a new series called *Munroe's*, all about a neurosurgeon. As you might expect, he's been adding glorious colour and life-like detail to the intricate brain operations! 2011 already has a children's drama series about werewolves waiting just around the corner and no doubt, plenty more demand for gore, guts and glory!

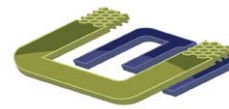
SFX News

Current films that are in production and are using Bentley materials include *Sherlock Holmes 2*, *War Horse*, *Johnny English 2*, the latest *X Men* saga, and finally (finally!) the last *Harry Potter*.

BAGGING BENEFIT



Bentley's busy stand at the show



The COMPOSITES ENGINEERING SHOW
The UK Design & Manufacturing Showcase
29-30 September 2010, NEC, Birmingham, UK

Bentley's new tailor-made vacuum bagging process featuring reusable silicone bags was an instant hit at The Composites Engineering Show at the NEC.

Demonstrations of how to create the new spray-on or brush-on bags drew a constant stream of interested companies to Bentley's stand, all eager to see the new system being demonstrated.

Over 150 companies, including a major motor racing team, airline and yacht builder are now set to capitalise on the major benefits that the new bags bring to the vacuum moulding of composite materials.

The silicone bags are very quick and easy to make and can be used over and over

again dramatically saving labour time, material costs and improving the quality of the moulding.

Pressurising a composite laminate removes trapped air between layers, compacts and strengthens the fibre layers, reduces humidity and optimises the fibre-to-resin ratio in the composite part. Composite mouldings produced by the process have a very high strength to weight ratio.

Traditionally vacuum bags made out of polypro are expensive, can only be used once and are quite time-consuming and fiddly to apply. They also quite commonly leave marks on the surface of the moulding where the bag has not completely vacuumed flat.



Handy Hints

NEW PRODUCTS

Crystal Clear

Crystal Clear (CC) is a UV-stable water-clear urethane resin. It is a product that is becoming one of our most popular casting materials for art forms and industrial use. Using CC is an art form in itself. If casting with CC into a mould, we have found that a platinum cure silicone is the most successful.

It is essential to pre-warm both CC and the mould. Warm CC to a temperature of 25°C and the mould slightly warmer at approximately 30°C. Make sure that both the Part A & B components of CC are thoroughly pre-mixed before you decant them, and then finally blend together.

Choosing the right grade of CC is essential. If you are casting a shape with sharp corners, such as a cube, a slower curing CC will be ideal to avoid shrinkage away from corners. Layer pouring is a technique which can also help.

Using CC to embed objects is another common requirement. Pre-coating and curing a small volume of CC around the object to be embedded is advisable. This will produce a much clearer effect and reduce the possibility of silvering when it is finally embedded in the greater CC mass.

Alja-Safe Acrobat: is a fibre-reinforced "non-sag" version of the original Alja-Safe life casting alginate. Acrobat is thicker and holds to vertical surfaces allowing the user better control for making moulds of the face, torso, etc. Acrobat is skin-safe and reproduces perfect detail from all body surfaces.

Acrystal Aqua: is a solvent-free composite which can be permanently immersed in water. Ideal for high-performance decorative castings such as fountains, aquarium rocks, bathroom furniture, film and theatre sets, it is non-toxic, low odour and durable.

Different Directions

Bentley continues to pour its expertise into a wide variety of new and diversifying businesses - often these are small start-up enterprises. Just two of these recent stories share a common theme - model boats and trains.

Ray Price is an enthusiast of radio controlled boats. He was always keen to add more features to available designs and so tried his hand at fabricating anything from radar domes to dinghies. Using just about anything he could lay his hands on to act as formers and moulds it was a bit hit-and-miss, but he was in regular contact



with the leading manufacturer of model hulls, Fleetscale, and as an existing client of Bentley's, they encouraged him to get in touch with the technical team. "The level of support I received from Bentley was incredible," commented Ray, "they were fantastic and whenever I had a problem of any sort they were always there to help out." As Ray developed his small portfolio of fittings using

Bentley's rubbers and silicones, he could see that there was a definite opportunity to make a commercial go of it and today, poised on the edge of commercial venture, Ray is planning to make 2011 his launch pad.

Ted Bamford is hardly a newcomer to business - he started Llanion Signs 50 years ago, but it is only recently that he has decided to diversify, once again, assisted by Bentley! The original business makes a variety of different signs - house signs, commercial signage, coats-of-arms and even badges for specialist motorbikes. His new enterprise, Penfron Lineside Models, was born out of an enthusiasm for model

railways, and as the name suggests, it embraces a wide variety of trackside extras, from houses to stations and even people. "Bentley began helping us about 3 years ago with Llanion, but the assistance we have received from Rob Price and the team in diversifying has been excellent - nothing is too much trouble." Now Ted is looking forward to hopefully seeing three generations become involved when his granddaughter follows his son into the business.



Photo: Courtesy of Mark Brennand, Newbridge Press



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