

Broadcast

Summer 2010



Bag Breakthrough



Cutlery Classics



Wonder Wall



Scottish Scorpion

Film Focus

In this Broadcast we are launching a regular feature on the world of film special effects. We're looking back at milestone products that have impacted techniques and practice, as well as profiling one of the industry's leading practitioners.

Bag Breakthrough

Major Benefits

Vacuum bagging is a technique that creates mechanical pressure onto a laminate during its cure cycle. It's a process that has been used for quite

are expensive, the bags 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

effectiveness of the method, adding another tier of major benefits.

Faster, Cheaper, Greener

The silicone bag process is much faster, cheaper and greener.

Labour costs can be reduced dramatically, by up to 90%, the silicone is easy to use and apply and the bags are more resistant to heat and chemical attack from resins. The process is non-hazardous and has no odour, and the bags can be used over and over

EZ-Spray vacuum bagging silicones. As the names suggest, bags can be produced either by using a brush-on process, or using a spray application system.

Brush-On

With the brush-on method, the silicone is first vacuumed and then applied direct by hand onto the surface of a composite profile sitting inside the mould tool. Brushes and flat spreaders can be used to apply the silicone quickly and uniformly. The silicone has a thirty minute pot life and once the completed layer has become tacky, a second application is made. Three layers are required to form the skin of the bag.

Creating a routed channel all the way around the edge of the moulding tool and making sure that the silicone also fills this channel will give the finished bag a much better seal onto the laminated surface when it comes to vacuuming the bag. Vacuum ports can be built onto the edges of the moulding tool using plastic piping as necessary, and wooden anchors can be added into the bag between the second and third layers to assist in handling the completed bag.

Once cured, after about 3.5 hours, the silicone bag can be peeled off and rolled up ready for production. The composite profile or former is then removed from the mould and the surface of the mould tool polished up in preparation.

Once the laminating has been done directly onto



Applying EZ-Brush silicone by hand

some time, especially by fabricators in the automotive, marine and aerospace industries when composite laminating - either carbon fibre or GRP laminates.

Pressurising a composite laminate serves several functions. First, it removes trapped air between layers; secondly, it compacts and strengthens the fibre layers; thirdly, it reduces humidity and finally, it 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 have been made out of polyprop. The materials

bag has not completely vacuumed flat. But now the introduction of new re-usable silicone vacuum bags is dramatically increasing both the efficiency and

again with a comparatively long shelf-life.

Two new products from Smooth-On are at the forefront of the re-usable revolution, EZ-Brush and



Silicone bag being removed



Routed channel to hold bag in place

the mould tool, the silicone bag is re-introduced and a vacuum is applied and the

The silicone has a cure time of approximately 20 minutes and can be very accurately applied with the gun. Any reinforcement is applied to the layer while it is still tacky and before the silicone thickness is finally built up to between 3 and 6 millimetres with the gun.

Once cured and removed, the bag is stored ready for use on the laminated layer as in the brush-on method.



Applying EZ-Spray silicone

moulding left until fully cured. The bag not only resists any chemical attack from epoxy, polyester and urethane resins, but it is also very flexible, tear-resistant and durable and can be re-used many times.

Spray-On

With the spray-on method the EZ-Spray Junior spray system is used to apply the silicone direct from cartridges.

The perimeter of the bag can be strengthened by applying a mesh fabric around the outer edges of the mould area and also around the areas where the vacuum ports are to be introduced.

Paris Composites Show

Returning from the world's largest composite show in Paris, Mike Dargan from Bentley was surprised by the level of interest shown, "The response on the stand where we were demonstrating the new process was overwhelming. We were inundated with questions. Some had concerns about silicone transferring onto the surface of the mould and contaminating it but that's an old chestnut, this silicone simply doesn't do that, it doesn't transfer. People were very keen to understand how they could adopt the process and we were able to help."

Bentley are already advising and assisting a

number of clients on how to capitalise on using silicone vacuum bags. A major boat builder is now exploring the benefits and a very well-known name in motor racing has already seen a three day moulding process reduced to less than one hour!

Chris Warren, Sales Director at Bentley added, "The market opportunity for silicone vacuum bags is very large – Paris taught us that. We are uniquely positioned, not only with the products, but also with the expertise on how to get the best out of the process."

Anyone wanting to find out more on vacuum bagging using re-usable silicone bags should ring Bentley direct on:
01562 515121



Silicone bag being positioned over composite moulding

Monster Moment



The fire-breathing Swampy

If you've been to one of the Top Gear Live shows over the last couple of years the chances are you may have encountered Swampy. No, it's not another nickname for one of the trio of presenters; Swampy is a very large fire-breathing monster that was the star of the grand finale.

The show's dynamic set, complete with the automated Swampy, is the work of Stage One - a company at the forefront of staging complex technical effects. The set incorporated a replica oil tanker, which split open to reveal the eight-metre high, automated, fire-breathing monster.

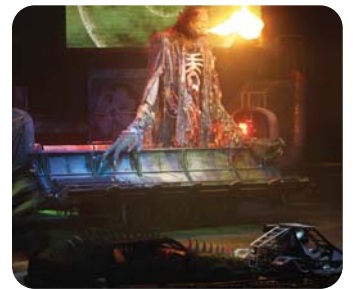
Swampy was constructed with a steel frame, a moulded head and four-metre long arms with oversized sculptured hands, and a substantial part of his construction incorporated materials from Bentley Creative Chemicals. Mike Dargan from Bentley's technical team was on-hand to advise with the use of Dragon Skin silicone, Psycho Paint and special flexible foam.

About 50 kilos of Dragon Skin was painted into a mould, allowed to cure and then backed up with FlexFoam X before being sprayed with Psycho Paint. The final construction was scenically dressed in camouflage netting and Swampy emerged from his resting place to spit six-metre long flames and fire pyrotechnics from his heart.

"Pulling all the elements of Swampy together proved extremely challenging, not

least because space inside the oil tanker was extremely tight; there was only 10mm to spare around Swampy," commented Stage One Project Manager, Ted Featonby.

The oil tanker was constructed from aluminium and fibre-reinforced polymer, then scenically treated to achieve an aged, rusty look. Sited on a flat bed trailer, it was a fully self-contained unit and with Swampy inside, weighed in at a mighty four tonnes.



Top Gear set

Pictures courtesy of Adrian Ray

Ashes to Ashes

If you happened to catch the very last episode of the recent TV series Ashes to Ashes, you may remember that there was a dream sequence which featured two larger-than-life mannequins representing the two leading characters.

The 8-foot high creations were the work of Codsteaks, specialists in 3D design and model-making for film and television. The company was tasked with designing and making two "It's A Knockout" style creations for the sequence.

References of the two



The two finished mannequins from Ashes to Ashes (Picture: Adrian Ray)

actors were sent to the team and they then set about the design of the mannequins. They had to be robust and at the same time, as lightweight as possible, so that they

could be easily manoeuvred.

From preliminary sketches, a foam core was assembled for each model and then covered in a

layer of clay which was then sculpted. A two-part plaster mould was made and FlexFoam X, coloured with a So Strong flesh pigment, was poured into the plaster mould and rotationally cast. According to Codsteaks the FlexFoam "worked a treat".

The hollow casting was then paint sprayed with acrylics to finish the features. All that remained then was to create the over-sized costumes to complete the mannequins, ready for their screen debut.

Cutlery Classics

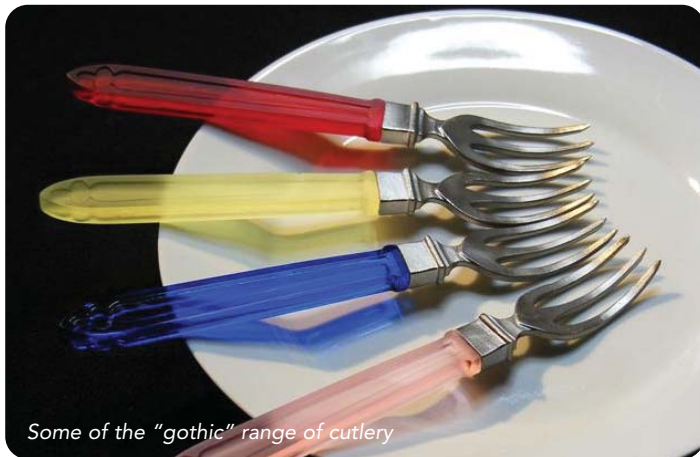
Scottish Scorpion

Steve McCarron's background is from the world of architecture and stone sculpture, so his passion for creating highly original and unusual cutlery seems, at first sight, to be far removed from his roots.

He described working and sculpting in stone as one of the hardest disciplines. The material is pretty unforgiving if you make a mistake, and much of the time can be spent outdoors exposed to the elements all year round. Working in bronze became an attractive alternative – the material can be re-shaped and re-worked far more

possibility but lacked manufacturing flexibility. I was looking for a resin that could be pigmented to give attractive colours like sapphire and emerald, and at the same time would be thermo-stable for dishwasher environments."

After a short internet excursion and search, Steve was more than a little surprised to find that the solution was almost around the corner from his workshop - at Bentley Chemicals in Kidderminster. Crystal Clear resin gave him all the qualities that he was looking for. Optical clarity, range of colours, easily vacuumed, UV stable, heat



Some of the "gothic" range of cutlery

easily and it's nearly all in a workshop environment!

Steve has been designing and originating all forms of art work and sculpture from his workshop in Worcestershire for over 25 years and if you look at the inspiration behind some of his unusual cutlery, you can see that many of the design elements are taken from classic Gothic architecture.

"I had always liked materials like jade, ivory and Bakelite that had been used widely in the 20s to create attractive handles" commented Steve, "When considering a suitable resin, I knew that acrylics were a

resistant - all these made it a sure-fire winner.

"Bentley were extremely supportive with all their technical help" added Steve. Interestingly all the additional expertise that Steve required to help him in his quest to perfect his cutlery range was supplied by four companies – all of them are almost within a stone's throw of his Worcestershire workshop.

The future is looking strong for Steve's cutlery. It's recently caught the eye of Michel Roux Jr who insisted that it was featured in a magazine that he was editing...Success on a plate?



Dr Dave Williams applying silicone to "capture" the fossil (Courtesy of The Courier, Dundee)

Just over a year ago we carried a story about a company called GeoEd and their work making high quality fossil replicas. The company had considerable experience of working on unusual commissions - everything from moulding dinosaur tracks, through to capturing a 120 square metre rockface for the British Geological Survey.

At that time they were engaged in a project in limestone caverns deep under Dudley, using RTV 3540 from Bentley, moulding sections that had previously been made famous by the "Dudley Bug" - a unique trilobite fossil which was discovered there and proudly features in the Borough's Coat of Arms.

This year GeoEd have been drawn north of the border to capture evidence of a giant scorpion which once roamed Fife. The six-legged hibbertopterus is two metres long and a metre wide and lived millions of years before dinosaurs at a time when Scotland was closer to the equator. The beastie is related to modern-day scorpions and

horseshoe crabs.

The sandstone fossil, which included footprints and a trail from its long tail as it crawled over damp sand, has caused excitement among geologists and is also the largest known walking trackway of any invertebrate animal.

Dr Dave Williams of GeoEd was commissioned by Geoheritage Fife to make a cast of the fossil and once again has been using silicone from Bentley. The fossil is under threat from erosion and its exact location is being kept a closely guarded secret to also protect it from the risk of vandalism.

Richard Batchelor, chairman of Geoheritage Fife, said "The trackway is in a precarious situation, having been exposed to weathering over the years, and that the rock it is in is in danger of falling. Removing it and housing it in a museum would be prohibitively costly but moulding it in silicone rubber and making copies for educational and research purposes means that we can still see and research this huge creature's tracks in years to come."

Milestone Products

In the late 1970s Bentley Chemicals took its first steps into the world of film and video special effects, creating a large glass of champagne for a Pink Floyd pop video. Over the last thirty years, a series of "product milestones" have marked step-changes in what could be achieved.

The introduction of FastCast resins heralded in a range of products that were greener and much friendlier to use. The introduction of



Animatronic gorilla head

products and technical expertise became an increasingly attractive proposition for the major film studios.

Hugo Cabret, and another Pirates of the Caribbean.

SFX Profile

One practitioner who has been involved in special effects and film set construction for many years is Kenny Wilson. He first began using products from Bentley in the early 90s although his career in film work goes back to the late 70s.

Before becoming involved in films, Kenny had served his apprenticeship working in ornate architectural work using fibrous plasters. A friend advised him that Shepperton Studios were looking for people, and before he knew it he was in.

The studios were thriving with productions of films like Flash Gordon, Star Wars and Raiders of the Lost Ark - there was plenty of work for skilled architectural plasterers.

Kenny became more involved in specialised moulding and casting, away from set construction, using polyurethanes, silicones and foams. With

the arrival of films like Dark Crystal and Greystoke, the work took on another dimension.

Film makers were increasingly using not only more elaborate and complex film sets, but also special effects automated creations that were becoming far more sophisticated and life-like, both in their appearance and in their performance capabilities.

New ground was being broken and the term animatronics soon became a part of the regular vocabulary. Before long it was a fully-fledged specialism of its own. The sophisticated moving structures required a totally new approach to make-up and special effects prosthetics.

Kenny's growing experience in animatronics saw him move to work full time for the Jim Henson Company in 1988 and by the early 90s he was buying materials from Bentley Chemicals. "In the early days some of the materials we were using could be a little bit temperamental.



The Ice Palace from Die Another Day. (Copyright: "Die Another Day" © 2002 Danjaq, LLC and United Artists Corporation. All rights reserved.)

Skinsil completely changed the way lifecasting was done and urethane "breakaway" glass made possible the spectacular ice palace scene in Die Another Day.

One Stop Shop

In the early days, much of the volume business in films was supplying gypsum for use in the construction of stage sets. It's still important today but the growing availability of a diverse and new range of products from Smooth-On meant that the company could supply polyurethanes, foams, liquid plastics and rubbers as well.

The fact that the Company could offer a one-stop-shop solution for a wide range of

Big Breakthroughs

One of the other factors that helped raise Bentley's profile was the increasing sophistication of animatronics and in particular their size. One particular creation that Kenny Wilson - who features in our SFX Profile - was involved with was a sea monster that needed nearly 7 tonnes of material. Bentley was the only company positioned with the right product and the technical know-how.

Today the Company is continuing to work closely with all the major studios on the very latest productions. As we go to print, productions include Captain America, The Invention of



Set from Alien v Predator

Wonder Wall

But things were always improving and we found that Bentley's range of Smooth-On products was very good – it was cutting edge stuff."

Films ranged from the Muppets through to Babe, and the work embraced TV productions too with programmes such as Storyteller, as well as major commercials. The arrival of new skin-safe silicones helped to improve lifecasting techniques and Kenny was able to put these to good use on



Lifecasting with Skinsil

productions such as Sweeney Todd and Lord of the Rings.

In 2004 Kenny went freelance and more films followed. From Alien v Predator and Stardust, through to Prince of Persia and Clash of the Titans, the demand for his skills kept him very busy. Today, Kenny is working on the set of a Paris railway station being constructed for the film The Invention of Hugo Cabret. He reflected that the whole industry had changed dramatically over the years, but no matter what side you were working on, from construction though to make-up and special effects, it was still a dynamic and exciting business to be in.

It's surprising where materials supplied by Bentley sometimes surface! Built almost 2000 years ago to house a Roman army garrison, Chester's Roman Fort is one of the most impressive visitor attractions in the North East. Part of Hadrian's Wall, it's the best-preserved Roman cavalry fort in Britain.

English Heritage has recently added an orientation model to this impressive site so that visitors can get an instant understanding of its layout and features. The model has also been designed to function as a tactile "access tool" for visitors who cannot easily get around the site.

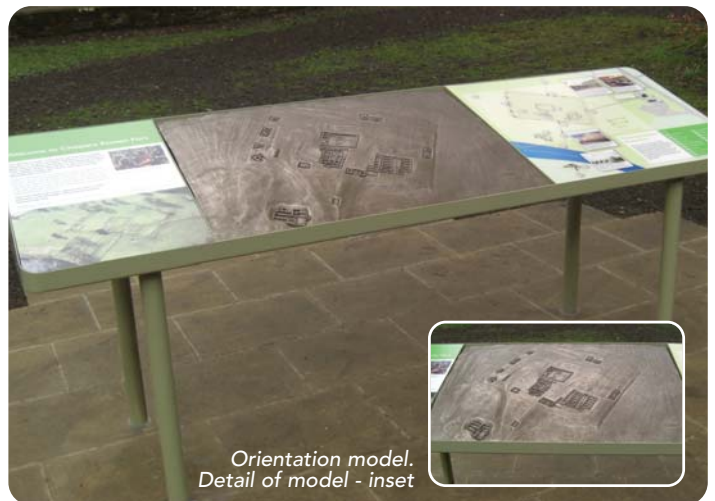
Two local companies were involved in the project – Bivouac, who created the

design and Workhaus Projects, who constructed the model using Bentley's materials.

Workhaus first created a complete 3D model of the entire site out of clay. This was sealed and then Mold Max 25 silicone rubber was used to create the mould. The casting was then made out of polyester resin with a

bronze filler. "We got extremely good advice from Bentley," commented Workhaus project manager Barry Clamp, "they came to see us to help in the process and it was beyond the call of duty."

The finished model, complete with its welcome panel, map and index key was installed at the site in March this year.



Orientation model. Detail of model - inset

Food Fashion

Michele Claire is building a thriving business based on an unusual and creative approach to making a wide range of edible items – everything from cake decorations through to diamonds, photographs and even balloons – yes, edible balloons!

During a prolonged illness Michele got bored and decided that she wanted to do something constructive with her time. Her interest was in cake decorations and so, tasked with making a wedding cake, she began experimenting with real flowers, taking

them apart and then coating the petals with food grade silicone from Bentley to create moulds. From these petal moulds she then made sugar-based castings to assemble her edible and highly realistic flowers.



Some of the edible decorations and jewellery

The process worked and soon she was creating a range of decorative flowers out of gum, chocolate and even nougat. The company Lemonella was born.

Michele's imagination kicked into overtime and it wasn't long before she was experimenting with creating edible jewellery - edible diamonds were next on the menu of success, and somewhere along the way Heston Blumenthal spotted her creative and unusual flair and commissioned an edible mirror!

"I suppose it's where chemistry meets confectionery," commented Michele, "the only limit is imagination. We've already looked at edible balloons and edible packaging; the sky's the limit really."

Michele's plans are to keep the business bespoke and tailor-made with unusual commissions driving her creativity.



Handy Hints

NEW PRODUCTS

Dragon Skin FX PRO

FX PRO is a prosthetic grade platinum silicone with a fast cure of 40 minutes. It has a great slush stage so it can be rolled into moulds, but it also can be thickened so that you can brush it easily into an open face mould.

It can also be used as a moulding material where delicate parts need to be replicated. Its 2 Shore A softness means that it can be easily stretched open to release small and breakable castings and it will then spring back to its original shape.

When using it to make a block mould that requires a cut to release the casting or component, its translucency makes it ideal, enabling accurate and precise cutting.

It is also suitable for pigmentation, and in its cured form, it has great resistance to polyester resins.

Hint: Add 80% Slacker (by volume) to Dragon Skin FX PRO to create a beautiful silicone gel that can be encapsulated in cap plastic or in silicone. This super-soft gel creates a great flesh-like feel but with the added bounce and stability of a platinum silicone.

Dragon Skin Fx Pro : This is a 2 Shore A, low viscosity platinum silicone that makes super-soft appliances without the need to add a deadener. Silicone cures to a soft tack-free finish and does not exude oil. It also has a gel stage so it's easy to slush into moulds. Pot life is 10-12 minutes, full cure 40 minutes.

EZ-Brush Silicone 20: A vacuum bagging silicone - this 20 Shore A brush-on platinum silicone rubber is perfect for creating re-useable vacuum bags. It has a 30 minute pot life and a cure time of 3.5 hours.

Curetime Check

Since its launch early in the year, Curetime, the learning resource for specialised moulding and casting, has seen a steady rise in people accessing its information.

The modules contained in the Curetime Academy are spread across moulding, casting and special effects and the team are continually working on new subject areas and adding new modules each month. The modules are grouped under three generic headings but the choice under each heading is left

down to the user and a pick-and-mix selection approach remains the policy.

"It's still early days as we



develop and increase the content," commented Rob Price from the team, "but it's really encouraging to hear about people who

have found the modules very helpful and have already been able to use the high-value information they contain to diversify their business and increase their skills."

The Curetime Shop contains all the major materials needed for the modules, and they are at a discounted price. And don't forget, there's an additional discount for university and college students. More information via contact@curetime.co.uk

Slo-Jo: A platinum silicone retarder - adding from 1-2% increases the cure time of your rubber giving you a longer working time. Exceeding 4% may change physical properties of rubber.

Solaris: An optically clear platinum silicone for encapsulating electronic components. It is highly UV and corrosion resistant, and has a wide serviceable temperature range.

EpoxAmite: Laminating epoxy "one push" dispensing pumps are calibrated to deliver the correct amount of Part A and Part B hardener with a single push - no need to weigh or measure by volume.



Tel +44 (0)1562 515121
Fax + 44 (0)1562 515847
info@bentleychemicals.co.uk
bentleychemicals.co.uk



Frederick Road, Hoo Farm Industrial Estate,
Kidderminster, Worcestershire DY11 7RA, England.

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