vanglobe

specialising in compounding & micronising

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Rotomould 2008 Round Up

The Vanglobe sponsored Rotomould 2008 annual ARMA conference was both an interesting and enjoyable event according to those who attended. Including presentations from Gareth Morgan of SAI Global, Leisa Donlan and our very own Gary King, the conference was an opportunity for moulders and suppliers alike to increase their knowledge of the issues affecting the market at present along with providing the chance to drop the "healthy" rivalry for a few days!

Vanglobe used Rotomould 2008 as the platform to promote Rotathene as the environmentally conscious choice for rotational moulding powder since our introduction of Heavy Metal Free pigments in 2007. Gary King's presentation, Delivering A Better Outcome explained this in more detail and was very well received (see over for more about the presentation). Heavy Metal Free pigments is a relatively new feature of Vanglobe Tank Grade colours but it has generated a lot of interest and desire to find out more about how customers can promote the "green" image in their products. Vanglobe are more than happy to help any Rotathene customer with promotional literature and temporary signage promoting Heavy Metal Free, please contact your customer service officer for more information.

Rotomould 2008

Create the Future or Duplicate the Past

However, it was Vanglobe's Dinner with the Dolphins that was arguably the highlight of the conference. Held at the world famous Sea World, delegates enjoyed a range of hot canapés and drinks, as well as some much needed networking time, before sitting down to enjoy a spectacular dolphin show. As a welcome to the event, Merv Bullard from Rotoform Plastics was lucky enough to find something other than chewing gum under his chair! On this occasion, it was a Sea World Helicopters ticket giving him the amazing opportunity of seeing the Gold Coast from the air. Gary accompanied Merv on the flight on Monday who, as a first time attendee to the conference, thoroughly enjoyed the experience.

Back to the main event and, sat just feet away from the pool, all attending marvelled at the displays by the engaging marine mammals. Two members of the audience were fortunate enough to be given the chance to enter the pool and say hello to the dolphins first hand. Cue some very jealous Vanglobe team members!!

Rotathene® Type Test Accredited

Following a lot of hard work by our Technical Team, Rotathene® 11UV, 6338, 6439 and Black 22 have been granted Type Test Certification to AS/NZS 4766:2006 from SAI Global.

Type Test Certification is offered by SAI Global for materials that are not covered by the StandardsMark Scheme (the "5 ticks" we all know and love!) but that will benefit from independent verification as part of a supply chain to certified end products.

There are requirements for raw materials to show compliance under AS/NZS 4766 and Type Test enables us at Vanglobe to demonstrate to you that Rotathene® complies. There are also requirements for any materials that come into contact with drinking water to show compliance to the potable water requirements under the AS/NZS 4020 Standard and plastics materials for food contact under the AS 2070 Standard.

The Type Test verification process is a system 1 certification where the independent test reports of the sample material coming from accredited and/or recognised laboratories are assessed for compliance to the specific standard and its applicable sections.

Compliance of the manufactured tanks to the Standard is not only a product risk management strategy, but also provides long term strategy for managing the quality of the products and the health of rotational moulding in Australasia.

With Rotathene® receiving this certification, we are hopeful that the majority of our customers will now find it much easier and quicker to achieve AS/NZS 4766 accreditation on their tanks.

Type Tested
AS/NZS 4766:2006
Lic: PST 20130
SAI Global

Visit www.standardsmark.com for more information and to see if your other suppliers hold the Type Test mark!

Foaming Agents

New Rotathene® ExPE Series launched

Foam structures are used in rotomoulding to produce a range of effects including increased part rigidity, insulation, floatation, weight reduction and cavity fill. Two main processes are used to create a foam layer in a moulded product: chemical blowing agent added during moulding and polyurethane foam filling.

Polyurethane foaming is a post moulding process that fills a hollow moulded part to increase strength, insulation or buoyancy. The foam is created using a two-component liquid system that is added using a special mixing head. The 2 liquids then react inside the part and the mixture rises to fill the cavity. One of the frequently reported side effects of this process is that of distortion caused by the generation of high foaming pressures. Extensive jigging of the part may be required to minimise this effect.

While polyurethane foaming is a relatively quick and simple process, it has a major downfall in that there is little to no adhesion between the polyethylene parts and foam. This has the affect of reducing the long term strength and insulating properties created by foam filling. Add to this the fact that this process can be messy, associated with Health, Safety & Environment issues and difficulty in recycling parts and polyurethane foam filling becomes a less attractive option.

When processed correctly, the use of a chemical blowing agent in rotational moulding effectively forms a connected foam layer within the moulded part that can offer excellent strength and recyclability.

Because it is performed during the moulding process, it can also reduce the need for jigging and additional operations.

The selection of a chemical blowing agent must take in to account a range of factors, including decomposition temperature, rate and volume of gas release, ease of dispersion, toxicity and, of course, cost. Typically, of prime concern to the moulder is the decomposition or activation temperature, as well as the expansion rate of the formulation being used. Additionally, cell structure and uniformity will play a major role in the final part properties.

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Resin	Foam Density g/cm3 (~% expansion)
Rotathene® ExPE2	0.390 (250%)
Rotathene® ExPE4	0.315 (300%)
Rotathene® ExPE6	0.240 (400%)
Rotathene® ExPE8	0.150 (650%)

Please note: the values above are an average of measurements taken on representative mouldings produced – they are not to be taken as specifications and may vary depending upon moulding conditions.

Vanglobe's new range of foaming resin, Rotathene® ExPE, is ideally suited to the higher temperatures used in rotomoulding and the production of thicker parts. They are compatible with the full range of Rotathene colours and are available in 2 stocked grades (ExPE4 & 8), depending on the foam density required.

The Rotathene® ExPE series of resins are specifically formulated for the rotational moulding market to provide an impressively lightweight, yet firm moulding with an impressively uniform, tight cell structure of expanded polyethylene foam - see image on previous page

When moulded inline with usual foaming practices, an outstanding level of adhesion between the skin layer and the ExPE foam may be achieved providing for an inherently stable part that will strongly resist delamination and provide for improved long term part performance.

Rotathene® ExPE foams are intended for use in weight reduction programs for existing, as well as new to market products where structural strength and low mass are important performance criteria. Equally, Maritime Safety and Thermal Insulation products will find improved application utilising this technology product.

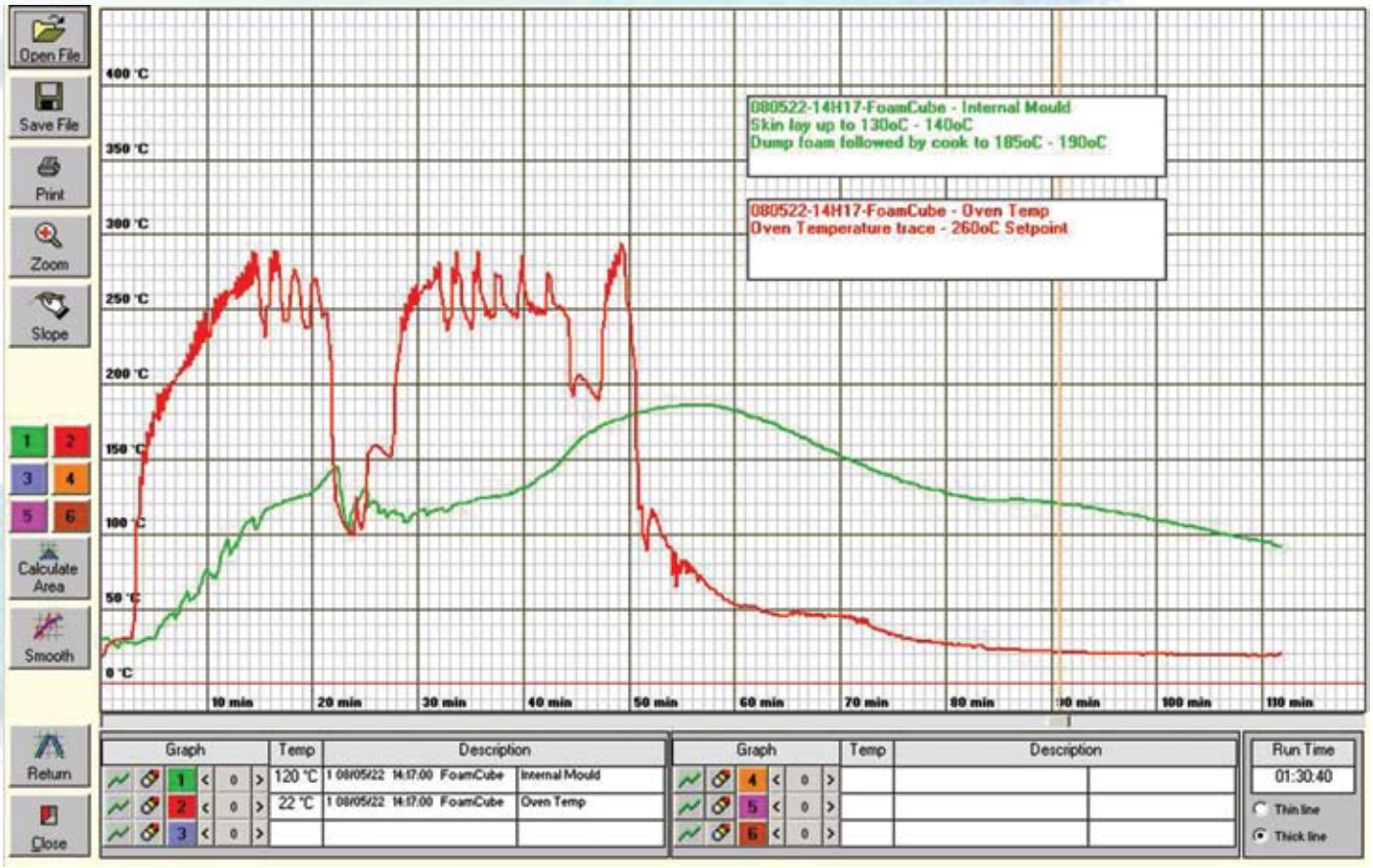
Supplied in a powder format, Rotathene® ExPE resins are intended to be used in a multi shot process. Ideally, as with all process control challenges, the use of an internal temperature measurement system such as TempLogger™ will allow the greatest degree of product consistency.

Application

The application of a two (or more) shot foaming process involves the laydown of an LLDPE outer skin, followed by the dosing of the Rotathene® ExPE foaming agent via means of a built on "Drop Box" or any alternative manual method.

Ideally, the laydown of a skin layer should be allowed to progress to a point where almost all of the free powder has adhered to the mould – typically 120-140oC Internal Air Temperature (IAT) as shown in the TempLogger™ trace below. At this point, a predetermined dose of Rotathene® ExPE is introduced and allowed to laydown on the inside surface of the outer skin until fully cured.

Possessing an activation temperature of approx 180oC, it is recommended that the ExPE system is allowed to reach an IAT of approximately 185-190oC to achieve full expansion. It has been found through moulding trials conducted at the Vanglobe R&D centre that allowing the system to reach higher temperatures does not yield additional expansion.



Note – if a Skin-Foam-Skin format is required, an additional shot of LLDPE resin is to be introduced at a point where the free ExPE resin has been laid down, but not expanded (~120-140oC), and then allowed to progress to full cure.(~185oC)

OH&S Consideration

While the foaming agent used in the Rotathene® ExPE series of resins has been shown to yield an excellent result in terms of consistency of foam structure, it has also been found that ammonia gas is liberated as a by-product of expansion that needs to be managed by the use of appropriate Personal Protective Equipment and ventilation.

Flame Retardant

Vanglobe launch Rotathene® FR

Few people would argue about the benefits of containing products such as explosives or scientific equipment in an LLDPE housing that would either not catch alight in the presence of fire, or would self extinguish when the fire (or container) is removed. Likewise, firefighting equipment needs to be able to withstand potentially volatile conditions in the process of performing its duties. However, traditional polyethylene will readily burn in the presence of an ignition source, sufficient energy and oxygen which makes in unsuitable for the examples above along with other circumstances where this situation needs to be avoided, either due to the environment in which a moulded product is to be used, or what is to be contained within that moulded product.

In these cases, as well as many others like them, the use effective flame retardant (FR) additives may mean the difference between rotationally moulded products being used for the application in place of traditional materials such as metal or fibreglass.

Over the past several months, Vanglobe R&D in partnership with our Masterbatch division, Blythe Masterbatch, has been working on a number of additive formulations with an aim to achieving an effective product in terms of flame retardant properties, whilst maintaining processing, aesthetic and impact properties of the final moulded product. Recent laboratory and field tests have shown that we have indeed achieved this goal with the introduction of **Rotathene® FR.**

Rotathene® FR is a hexene co-polymer Linear Low Density Polyethylene (LLDPE) resin specifically designed for rotational moulding applications that require a high level of flame retardance and, most importantly, conforms to UL94-V0 requirements.

Rotathene® FR utilises a base resin which has high level ESCR and chemical resistance, along with excellent toughness and stiffness. It is available in a standard opaque off-white, but may be tinted to develop a range of colours - specific colour requirements will need be discussed with your local Vanglobe representative.

Additionally, this formulation includes the use of a UV8 base resin with a supplementary UVA additive for added UV Protection.
In terms of flame retardance, this formulation has been independently assessed to not just meet, but to exceed the requirements of UL94–V0 materials. Samples tested to this standard essentially self extinguished either immediately, or within one second of the removal of the test flame. The standard allows for up to 10 seconds for this process to take place.

As an added level of supply security, Rotathene® FR is manufactured from locally available materials and therefore can be manufactured to order.

While it may be suggested that exceeding a performance requirement is just like having too much of a good thing, we believe that offering a premium "benchmark" product should be what you as a moulder should demand from your supplier.

Delivering A Better Outcome

A summary of Gary King's Rotomould 2008 presentation

Heavy Metals

With more and more consumers demanding environmentally friendly products, Vanglobe took the decision to remove all traces of Heavy Metals from its Tank Grade colours back in 2007. It is only now, with all the articles appearing in the news lately, that this choice has become a real differentiator in the rotomoulding market. The published articles, most recently about lead in rainwater tanks, are making the links between heavy metals and health issues ranging from cancer, kidney disease and learning disabilities. As manufacturers and suppliers, you can make a difference by choosing a heavy metal free powder, such as Rotathene, for your products. By making this choice, you are reducing the risk of air and water pollution throughout the rotomoulding process, from pigment manufacture to masterbatching and micronising and, of course, loose powder in the moulding operation itself. Heavy metals don't just affect us either; products containing them can not be recycled at the end of their life. If there are traces of heavy metals, you can't burn for heat recovery, re-process or even bury the used product!

Material Selection

At Vanglobe, we search the world for the most suitable resins to meet market demands. At present, our range includes various grades of butene, hexene and octene based rotomoulding powder as well as speciality products such as flexi resin, flame retardant, paint primer and foaming agents to name a handful. Along with our extensive product range, Vanglobe also offers a second-to-none Technical Service from our R&D Lab in Melbourne, where our technical team perform tasks including checking product data sheets, new product identification, additive R&D (in conjunction with Blythe, our masterbatch division) and optimisation of your process from inside your plant.

Quality

For your piece of mind, we wanted to point out that there isn't a tank out there that has failed due to material fault when moulded from Rotathene.