

magazine

**DEC
2015**

**Tenjam “Firm” Furniture
Success by Design**

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Stress Crack
Resistance – Part 2**

**A simple trick to get
your cooling a little
more consistent.**

**Persico Teams up with
Ferragamo On Art
Installation in Florence**



Image Courtesy of:





ARMO CHAIR MESSAGE

Rotomoulding & The Internet Of Things

Imagine a world where your products tell you if they aren't working properly, contact a provider to schedule their own services or repairs or "learn" what their owners prefer and provide it automatically. This is already a reality for fridges doing the shopping, etc.

I first saw a conference presentation on "the internet of things" in 2014 that identified some of the potential for rotational moulding in using emerging technologies to manufacture smart products and then mining the data they provide to continue to develop relationships with end users and the products we make. At that time the presenter predicted that by 2017 an estimated 90M people will live in smart homes and by 2020 there would be more than 50B connected devices. Since then it has emerged that "the internet of things" or IoT is clearly the near future for business and traditional manufacturers needs to be working now to find out what potential there is for them.

But what could be the benefits to your business? Perhaps to know absolutely where every one of your rotomoulded road barriers is located at any time? A rotomoulded planter that informs his owner about the humidity in the soil? Kayaks that monitor travelled distances and speed?

"The next eighteen months will see a tectonic consumer shift towards connected devices, from automobiles to homes to wearables. It's about creating a world where a product is not a product – it's a service."

Other than choosing a color or putting a decal on it, a stand-alone product can't be personalized but a smart product can learn your behavior and preferences, it can be constantly upgraded so that it gets better and better (rather than obsolete) and it won't be considered simply an asset in decline. To meet the expectations of today's customer moulders must move beyond products and into services or from a product experience to a subscription experience.

It's important to remember that the way to succeed in IoT is the same as it ever was, building strong & recurring relationships with your customers. The interconnectivity of the internet is a huge opportunity to help you do just that but with how quickly technology changes, it is vital you have access to technology specialists in your business. Ultimately IoT is about enabling companies to meet the demands of today's changing consumer, whether it's the end user, your direct client or both. The potential to separate your company from your competitors by accessing IoT is immediate and urgent.

■ Oliver Wandres

This issue is supported by



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ROTOMOULD 2016 THE ARMO CONFERENCE



JUNE 19-21

Gold Coast, Australia

www.armo2016.com



ARMO
AFFILIATION OF ROTATIONAL MOULDING ORGANISATIONS

SPOON, I EAT EARTH: PERSICO TEAMS UP WITH FERRAGAMO ON ART INSTALLATION IN FLORENCE

Sixty-three rotomoulded regenerated plastic spoons, each one-and-a-half metres high, embellishing the façade of a stately Florentine hotel.

These are some of the striking elements of a new art installation, “Spoon, I Eat Earth”, by the Italian architect and designer Simone D’Auria. The work is currently on display at the Gallery Hotel Art in Vicolo dell’Oro, a short distance from the famous Ponte Vecchio (Old Bridge) in the centre of Florence.

Inspired by the theme of Milan’s Expo 2015 “Feeding the Planet, Energy for Life”, the project focuses on the “Spoon”, a symbol of nourishment and one of the oldest utensils used by humans. The installation was commissioned by Ferragamo Group’s Lungarno Collection, a luxury hotel management company and owner of the Gallery Hotel Art.

To bring his vision to life, Mr. D’Auria, who is also the art director of the Lungarno Collection, turned to the well-known rotomoulding expert Persico Industrial of Nembro, Italy. Persico not only became a sponsor, but also provided the key tools to realize the large plastic spoons. Over the years, Persico has collaborated with numerous artists to give shape to works of art using innovative materials and technologies.

For the “Spoon, I Eat Earth” project, Persico first scanned a sample of the spoon provided by Mr. D’Auria and generated data files. After certain details of the spoon were modified on request of the artist, a polyurethane model was made.

Before



After



Files Spoon



Mould Spoon



Then Persico prepared a CNC-milled aluminium mould for the production of the spoons. Finally, the actual 1.5-metre spoons were rotomoulded with Persico’s moulds using regenerated polyethylene plastic. The 63 huge spoons positioned on the front of the hotel in a target motif – red ones encircled by white – are a sight to behold.

The 1.5-metre spoon is named “Bruno” in honour of the artist Bruno Munari and his artwork, a source of inspiration for Mr. D’Auria. What’s more, the recycled plastic Bruno Spoon is available separately as a delightful art object: a spoon to stimulate the desire to “eat life” – to nourish one’s life not only through food but also by doing or inventing something new. Additionally, the spoon highlights the relationship of the individual with the Earth and the concept of hunger in the broad sense – hunger for life, knowledge, liberty and experience.



Become an art object



TENJAM
“FIRM”
FURNITURE
Success
BY DESIGN



Touting its product line as allowing customers to “unleash creativity and boost the visual identify of branded environments,” Tenjam (Atlanta, Georgia, USA) has recently converted a number of its traditional products from coated urethane foam to rotomolded polyethylene via launch of its “Firm” furniture line.

While Tenjam’s traditional “Flex” products have been greeted enthusiastically by customers, the tendency of its coated urethane foam construction to absorb moisture when exposed to outdoor environments limited its market reach. After considering alternate manufacturing processes to expand market opportunities, Tenjam determined that rotational molding was the clear choice, due to design flexibility, physical properties unique to the rotational molding process, and the ability of rotomolded polyethylene to withstand environmental attack in outdoor applications.

To-date, the conversion-to-rotomolding process has been terrifically successful and relatively seamless for Tenjam, whose colorful, versatile and visually stimulating products are marketed to schools, offices, recreational and professional spaces throughout North America. Tenjam’s alluring geometric designs lend themselves effectively to the rotational molding process, and the rotomolded “Firm” products have

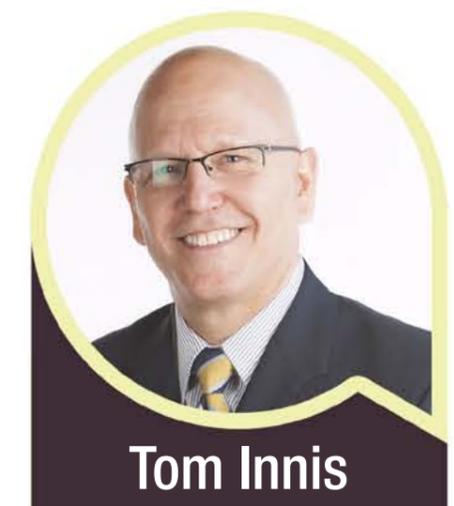
been readily adopted by supporters of its traditional “Flex” product line.

Tenjam’s successful conversion to roto was catalyzed by effective collaboration throughout the rotational molding supply chain, as well as the distinctly-rotomold speed-to-market advantages. Working in tandem with tool-maker, Avantech (Brainerd, MN USA) and rotational molder, Plasticraft (Darien, WI USA), Tenjam effectively optimized design-for-process characteristics, while adding unique options such as internally mounted light kits for the “Bright LED” versions of the “Firm” product line, and value-added features including flame-retardance and a wide variety of product size and color choices.

Following the wildly successful launch of the “Circ,” “Cube” and “Circle” products, Tenjam has expanded its “Firm” product reach in launching the innovative “Drift” stool and “Swerve” and “Dash” benches, which strike a perfect balance of form and function via the unique design characteristics and virtual indestructibility of rotationally molded products. And with recent promotion of its “Firm” product line at the EDSpaces exposition (New Orleans, Louisiana USA) and other sector-specific trade shows and exhibitions, Tenjam is reaching a broader audience and rapidly expanding its market reach.

When innovative product design converges with the right manufacturing process and a collaborative supply chain mindset, new market opportunities are uncovered. In the case of Tenjam’s “Firm” product line, rotational molding has proven to be the perfect vehicle in driving Tenjam to new avenues of success.

For more information on Tenjam, visit www.tenjam.com



Tom Innis

Tom Innis is President with Avantech and has been involved in the rotational molding industry for the better part of the past two decades. A graduate of the University of Wisconsin-Madison and La Universidad Ibero-Americana in Mexico City, Tom leverages his knowledge of international business, multi-lingual skills, leadership and sales and marketing experience to help drive Avantech and the global rotomolding industry forward.

TECHNICAL TALK

WHAT DATA SHEETS TELL YOU – AND WHAT THEY DON'T

ESCR – ENVIRONMENTAL STRESS CRACK RESISTANCE | PART 2

In the previous article of this series, I introduced Environmental Stress Crack Resistance (ESCR) as the only property on a typical rotograde PE Data Sheet that will provide any insights into the long-term strength of a material.

I also noted that there can be significant differences in ESCR between PE grades that are, on the face of it, similar in other respects. The key determinant of good ESCR performance is the presence, within the semi-crystalline material structure of PE, of tie molecules. These special entities “do what they say on the tin”, they tie adjacent crystalline areas together, in a network structure. The better the network, the more resistant is the material to stress cracking. See Fig 1.

The prevalence of tie molecules is not something that is normally measured and defined by PE suppliers, so you need to look for clues and hints. The first thing to look for is the type of comonomer that has been used to polymerise the

PE; grades are often described using an abbreviated version of the comonomer type: “butene”, “hexene” or “octene”. What’s a comonomer? Linear PE – the type used in rotomoulding - is polymerised from ethylene monomer in a reactor. PE created from pure ethylene has very high crystallinity (80% plus) and is known as high density polyethylene (HDPE). It is very rigid, but also extremely brittle. Toughness in PE is induced by selectively reducing its crystallinity and this is achieved by introducing branches in the molecular chains of PE. These branches interfere with the process whereby PE molecules fold up into crystalline form.

The most commonly used co-monomers for linear PE are butene-1, hexene-1 and octene-1. These molecules are short-chain hydrocarbons that can easily be incorporated into the structure of a PE chain, but part of the co-monomer

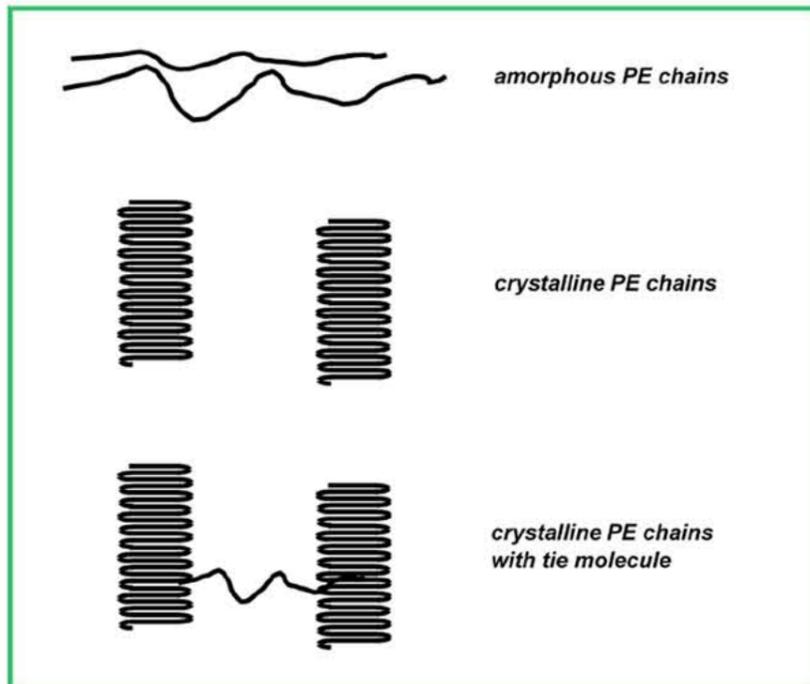


Fig 1: PE Chain Arrangements

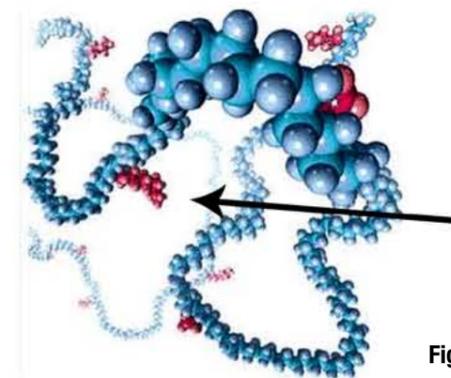


Fig 2: Co-monomer Branches in a PE Chain

molecule sticks out from the chain and prevents it from forming a fully crystalline structure. See Fig 2.

It is generally accepted that PE molecules built with hexene-1 and octene-1 comonomers have a micro-structure that lends itself better to the creation of tie molecules between crystalline regions than would PE molecules built with butene-1. Certainly, PE manufacturers who make these “higher alpha-olefin” versions of PE claim better ESCR.

Comonomer type is likely to make a significant difference to ESCR in “tank” grades, ie grades with a relatively LOW melt flow index – less than 3.5 – 4 g/10min. For “general purpose” grades (melt flow index 5 g/10min and above), the type of comonomer appears to make very little difference to ESCR performance.

In my experience, choice of comonomer type will only make a significant difference to a PE grade’s ESCR in certain molecular weight range. What this boils down to is this:

All this polymer chemistry talk reinforces the main point I want to make; if ESCR is important for a particular application, it’s wise to test, rather than depending on guesswork. Unfortunately our existing tests are subject to considerable variability and data interpretation, but I’ll save that for the next article!



Dr. Nick Henwood

Dr. Nick Henwood has over 20 years of experience in rotomoulding and is an acknowledged expert in roto materials. He currently provides consultancy and research services to the global rotomoulding industry through his UK-based company, Rotomotive Limited. You can contact him at:

nick@rotomotive.net

A SIMPLE TRICK TO GET YOUR COOLING A LITTLE MORE CONSISTENT.

TRICK #1

was helping you calibrate your oven. That is simply making sure your oven was at the temperature it was claiming to be at. The next obvious thing to calibrate is the cooling on your machine. This is a far more elusive variable to bring under control...that's because the temperature of the cooling medium is not something we control – we simply take air in from outside the cooling bay and blast the mould with it. This air can come from inside the factory or from outside the factory. Often these two places will provide different temperatures of air to the mould. So what is best? The answer is simple: the one that you can make most consistent.

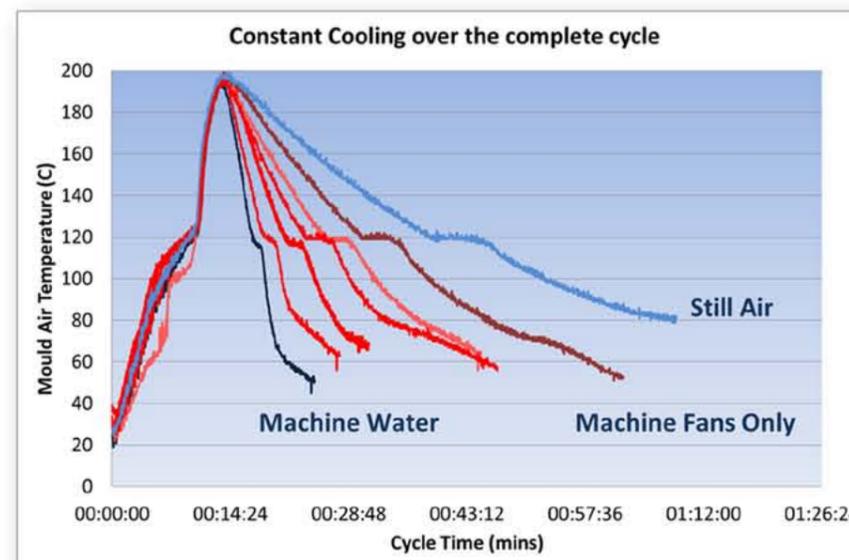
So TRICK #2 don't look for the coolest or the warmest or the driest, but just the most consistent air conditions. Consistency brings about control and provides you with confidence to make those other process decisions. If you find that the air from inside and outside varies considerably then it might be worth thinking about installing some simple air ducting that brings air in from both the outside and inside and mixes it pre-cooler. This mixing can be done with a temperature controlled butterfly valve and provide a step improvement in your cooling consistency. Measure the temperatures first though and check if this is needed.

Once you have a better controlled temperature of air to the cooling bay then what next? I would recommend you look at the force of your fans that are used to cool the mould. For best product quality we are looking for fans that will provide an even cooling all over, so don't use small diameter fans on large moulds that might spot cool part of the mould. Look for generous fans with a high volume of air and plenty of them to provide good even coverage. If you don't have a cooling bay then you should take care to minimise drafts that could cause a variance in the cooling rate (large bay doors opened and then closed, etc).

Different cooling media: air, water spray or water mist/fog will help to cool your parts faster but with any system the faster you drive it the greater possibility of crashing. My advice would be to make small incremental steps if you are thinking of using water. Again consistency trumps speed every time.

Many quality issues, such as warpage, shrinkage, difficulty in de-moulding and incorrect cure, to mention a few, can often be attributed to changes in process temperatures so do try to bring them under control. Here is a graph showing how it is possible to change your cooling times just by changing the cooling medium and controlling it, proof that quality issues can be minimised!

Why not start by measuring the air temperature that you use to cool your parts using a simple logger or a display that you can read above the cooling bay. Take note of this on a daily basis and you might just find that certain temperatures correlate with certain quality issues that you may have.



To summarise:

1. Cool your parts with air that has the most consistent temperature;
2. Install temperature controlled butterfly valves to mix inside and outside cooling air (if needed);
3. Monitor the temperature of the cooling air and correlate it with quality issues;
4. Use large cooling fans with high volume of flow and evenly distributed around the mould;
5. Remember consistency trumps speed every time (for good quality that is)

Hope this helps bring your machines a little more under your control!



Gareth McDowell

Gareth McDowell established 493K Limited to develop, and manufacture, data acquisition and control systems. These systems will improve quality and process efficiency, for the heating and cooling stages of rotational moulding. Advancing a body of research and development work, which started over ten years ago, he is currently marketing K-KONTROL and K-PAQ, a diagnostic mould temperature and pressure measurement system for 493K.

gareth.mcdowell@493k.com

ARM AWARDS ROTATIONAL MOLDING INDUSTRY EXCELLENCE IN ALBERTA, CONNECTICUT, NEW YORK, OHIO, QUERETARO, AND WISCONSIN



More than 245 members of the rotomolding industry attended ARM's 39th Annual Meeting in Denver .

George Winter from Muehlstein (Norwalk, CT) and Horacio Lobo from Versaplas (Queretaro, Mexico) were inducted into the Rotational Molding Hall of Fame.

George Winter was recognized as a tireless supporter of the rotomolding industry and ARM. He has made a significant contribution to the industry in terms of educating others and volunteering his time.

Horacio Lobo was recognized as a passionate promoter and defender of the rotational molding process. He serves as Director of the rotomolding division of ANIPAC and has single-handedly organized rotomolding meetings and seminars in Mexico. He helped to build one of the largest rotational molders in the world and is currently the Managing Director of Versaplas, a custom rotomolder.

The Charles D. Frederick Distinguished Service Award was presented to Ron Joannou Jr. from Formed Plastics (Carle Place, NY). The Charles D. Frederick Distinguished Service Award is presented to volunteers who go above and beyond the call of duty in ARM activities and committee work.

The winner of the 2015 ARM Product of the Year was Dutchland Plastics (Oostburg, WI) for their product, the Ice Breaker, which was also the winner of the Conversion Product Award. The Ice Breaker is an ice merchandiser that offers 24/7 self service, credit card functionality and remote access for inventory control.

The award for the Innovative and State-of-the Art product was presented to Dutchland Plastics for their product, the Sway Lounge Seat & Base. The lounge seat moves front to back, side to side and everywhere in between with a smooth 360 degree swivel.

The award for Large Product was presented to Norweco (Norwalk, OH) for their product, the Hydro-Kinetic Bio-Film Reactor. The hydro-kinetic bio-film reactor is a rotationally molded, durable, UV stabilized tank that incorporates Norweco's patented internal and external ribbed walls to insure uncompromising structural integrity and long-term performance.

The award for Recycled Product was presented to Formed Plastics for their product, the Portable Pole Sign. The Portable Pole Sign is made from recycled material compounded black and is used for traffic, safety and parking.

ARM presented two Safety Awards at the meeting. Formed Plastics and Flexahopper Plastics (Lethbridge, Alberta) both received the 2015 ARM Safety Award.

ARM congratulates all of the 2015 Award Winners for their achievements.



Australia will not only play host to the Rotomould 2016 ARMO Conference in 2016 but also for the first time, Rototour Australia & New Zealand. Organisation is well on its way with 8 factories already confirmed, with a minimum of 10 to be visited.

The program will start in Melbourne, the food and culture centre of Australia, to discover some of the distinct flavours that this city has to offer blended in with a very different range of factories. From here the tour heads to Queensland, home of beautiful weather and amazing beaches, starting in the capital Brisbane before heading down to the Gold Coast to attend the ARMO event of the year. As always Rototour is a great blend of tourist opportunities, networking and factory visits.

For those that wish to also see some of New Zealand, you can choose to take this add on and fly to Auckland after the conference to see how the kiwis do it, before flying home.

From the moment you attend the Welcome Dinner until the end of the Conference, or Auckland, the tour includes all of your meals and most drinks, all transfers and flights, accommodation in quality hotels and your conference registration. The cost for the Premium Tour which also includes New Zealand is AUD\$9000.00 + taxes and for the Experience Australia portion it is AUD\$7500.00 + taxes prices are available on request for partners and twin share options.

Included in the tour is Rotomould 2016: The ARMO Conference, which will be held on the Gold Coast from the 19th to the 21st June. The Rotomould conferences are industry renowned for their high level of value, excellent presentations and social events that are very much out of the box and 2016 will be exceptional as we display everything that the industry has to offer down under. Information on the conference can be found at www.aro2016.com

This is the perfect time to make the most of your trip to Australia and see some of the world famous sights we have on offer either pre or post Rototour. Places like the iconic Sydney Harbour Bridge and Sydney Opera House or the Great Barrier Reef in Far North Queensland. ARMA have put together suggestions on what to see or do during your time here and we are more than happy to assist.

The Rototour 2016 Registration Brochure will soon be available so please contact Michelle on mlorenzo@rotationalmoulding.com to register your interest and you can keep up to date by visiting www.rototour.com



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 **ARMO 2018**
AFFILIATION OF ROTATIONAL MOULDING ORGANISATIONS

ARM-CE are very pleased and excited to announce that they will be hosting the next European ARMO Conference.



While the planning is only in the initial stages, we would like to ask you to **SAVE THE DATE** in your calendars now.

ARMO 2018
Hamburg, Germany
16th to 18th of September 2018

With the excellent accessibility for international visitors, due to the closeness to Hamburg Airport, the world famous attractions of Hamburg City we believe the infrastructure for a global rotomoulding event is perfectly set.

We will keep you updated as the event progresses. If you would have any suggestions or comments on what to improve from previous ARMO meetings, we would be pleased to hear from you at info@rotational-moulding.de



SOUTHERN AFRICAN MARKET IN PERSPECTIVE

As presented at this year's ARMO Conference in Nottingham the Southern African Rotational Moulding Industry is hanging in there....2015 has not been the best of years but the future is the key to growth! So much so that the "Our Tomorrow Today" has been chosen as the theme for Rotation 2016 which will be taking place in the Magaliesburg, Gauteng.

On the back of "load shedding" (a system derived to restrict the usage of electricity due to severe shortages by way of force) the next big issue we are faced with is water shortages due to drought, the El Nino phenomenon is not doing anybody any favours or is it?

With great power comes great responsibility similarly with huge problems comes huge opportunity!

For those that embrace the challenges there should be no excuses..... this is no doubt prevalent across the entire world since it is easy to complain but extremely difficult to do something about it.

2016 will set the foundation for the way forward and what better way to make it happen than getting back to basics.

ARMSA will be presenting a Technical Seminar prior to the Conference with special guest Doctors – Dr Gareth McDowell and Dr Nick Henwood. This hands-on Training is sure to be a winner and will no doubt equip those that are ready to embrace the challenges.

Rotation 2016 will be taking place at Askari Lodge just outside Johannesburg on the 10th and 11th of March which is a Big 5 resort with plenty of character and surprises.

Another twist is the inclusion of the Cape Town Cycle Tour in the lead up to the Conference, the world renowned Bill Spenceley has already committed to this event and is ready to embrace the hills and winds of Cape Town on this special day.

I would like to openly invite all interested to join us for Rotation 2016 since it is sure to be an unbelievable experience and a great foundation for "Our Tomorrow Today"!

Wayne Wiid
ARMSA Chairman

www.armsa.co.za www.askarilodge.co.za www.cycletour.co.za



WHAT'S HAPPENING AT BPF



The British Plastics Federation, through its BPF Rotational Moulding Group, aims to support the Rotational Moulding Industry, helping it to fulfil its potential.

As part of the BPF Rotational Moulding Group's efforts to strengthen the Rotational Moulding Industry, the Group is pleased to announce that it has commissioned Dr Nick Henwood of Rotomotive and Mr Martin Spencer of Uniqueroto to create a publication highlighting key health and safety considerations for the rotational moulding industry.

The aim of the document is to provide a list of what to assess and what to look for when a rotational moulder is carrying out risk assessment. The document would highlight issues to be considered rather than prescribe solutions.

The document will consist of an introduction section that will provide an overview of the Rotational Moulding process and a 'Generic Risk Assessment' section covering all the main issues that are common to all rotational moulding machines.

The document will also include a series of individual machine guidelines for the most popular types of machines and will include a 'Specific Risk Assessment' section which will analyse particular issues associated these machines.

The BPF believes good Health and Safety practice should be available to everybody not just to its members; thus non-member of the BPF would be able to purchase the document from the BPF website when it is published in March 2016.

This is not the first time the BPF Rotational Moulding Group have worked in this area having previously published "Code Of Practice For Safety In The Use Of Rotational Moulding Machines" in 1982. A further update was published by the Group in 2002 and later updated with the help of the Health and Safety Executive (the UK Government body responsible for the encouragement, regulation and enforcement of workplace health, safety and welfare).

The BPF is also working in collaboration with the IT-RO, the Italian Rotational Moulders Association, and ARM- CE, The German Rotational Moulding Organisation, in an attempt to start working on a CEN standard or even an ISO if it is felt suitable.

The BPF would like to invite all interested parties (machines producers, moulders, material suppliers, trade associations etc) who would like to contribute to this project to contact Dr Sara Cammarano, BPF Industrial Issues Executive for the Rotational Moulding Group by email scammarano@bpf.co.uk or by calling +44 (0) 207 457 5013.



It's GOA Again !



StAR's 2016 Annual Rotomoulding Conference

will be held from Feb 1 to 3 at the Holiday Inn beach resort in South Goa. It will be the fourth time at the destination ever popular with conference attendees. "Rotoscope Growth Opportunities in Resurgent India" the conference theme is reflective of the economic sentiment in India under the new business friendly government.

Dru Laws from Seljan in USA is back after 2012 in Delhi and will be presenting seminars on "Best practices in rotomoulding" and "Introduction to Lean Manufacturing". Oliver Wandres, current ARMO Chairman, of MAUS in Germany will be offering a seminar on "choosing the right moulds & features". A fantastic programme of technical & business presentations by speakers both domestic and international offers topics like: Antimicrobial

plastics, Chemical Tanks, Roto-lining, Custom rotomoulding in India, Moulds handling & maintenance, Internal cooling, Painting of PE products, Mould release permanent coatings, Longer life outdoor products, High quality PE foaming, Rotomoulding industry in Poland and many more!

Suppliers & Moulders interests will be enhanced by the well planned Trade Show in octanorm stalls for active shown-n-tell and interaction between the two. The Trade Show will be open during all breaks & scheduled times during all the three conference days, in a close by separate section of the conference area and ballroom. Well known suppliers from India and rest of the world will be participating.

No StAR conference is complete without an excellent social activities programme with entertainment &

dinners enabling global networking amongst the attendees. The Suppliers Networking Dinner on the first evening will be under the starry colourful Goan ambience with musical entertainment. The Gala Dinner on the second evening will be an exciting & colourful beach event by the Arabian Sea. Enthralling entertainment will liven up the evening. Cocktails and special cuisine will add to a unique experience... and that is what StAR events in Goa have become famous & popular for.

HOPE TO SEE YOU ALL THERE on February 2016 !

For more information visit www.starasia.org

2016

UPCOMING EVENTS

- FEB**
1-3  **STAR ANNUAL ROTOMOULDING CONFERENCE**
City/Country: Goa, India
Further Information: www.starasia.org
- FEB**
9-10  **NORDIC ARM CONFERENCE**
Borås, Sweden
Further Information: <http://nordicarm.org/news-events/>
- MAR**
9-10  **ROTATION 2016**
City/County: South Africa
Further Information: www.armsa.co.za
- JUN**
2-3  **ROTOPOL CONFERENCE 2016**
City/Country: Cottonina Resort, Świeradów Zdrój
Further Information: www.rotopolevent.pl
- JUN**
12-21  **ROTOTOUR 2016 AUSTRALIA**
City/Country: Gold Coast, Australia
Further Information: www.rototour.com
- JUN**
19-21  **ROTOMOULD 2016 GOLD COAST: THE ARMO CONFERENCE**
City/Country: Gold Coast, Australia
Further Information: www.armo2016.com

AFFILIATES

