ROTO MOULDER magazine

ISSUE 05

JUNE 2016

ARMO
AFFILIATION OF ROTATIONAL MOULDING ORGANISATIONS

CONFERENCE ISSUE

Where Does All The Heat Go?

New Materials -New Applications for Rotomoulding

The Ogo -Rotomoulding could be the future of Mobility

The Benefits of Rotomoulding

ESCR -Environmental Stress Crack Resistance Part 3

Issue sponsored by matrix polymers

CHAIRMAN'S REPORT

Are You Spreading The Word About Rotomoulding?

One of the privileges of being a mould manufacturer is that I have the opportunity to see the wide range of beautiful, functional and incredible products that are being developed by our industry around the world. In the development stages many of these projects are highly confidential and so we aren't able to share them for some time after they are in the market but it is encouraging that so many unique products are still possible and new markets for rotomoulding are opening up.

Outside of our own client base I know there are already many rotational moulders working to develop relationships with the design industry to help lift the level of their products out of basic, commodity markets and into a more sustainable model for their businesses into the future, hopefully with larger margins for them.

Last September, ARMO began a project to support the global industry by preparing marketing material showcasing the wide range of products we already manufacture with rotomoulding and the capabilities of the rotomoulders around the world. We count on the support of moulders as well as suppliers to help us to collect a wide range of picture material. Soon you will be asked by your local association, so we can hopefully put together a representative collection of rotomoulded products around the world.

Set to be published in multiple languages and to be available for moulders and the supply chain to market the industry to architects, industrial designers product developers and inventors, this is a major project that we are confident will make a difference in the market but it's only part of what's needed.

In some areas of the world the affiliates of ARMO host design competitions, some manufacturers invite students and others to their factories to showcase the process and of course many moulders advertise their products directly to the market however there is still very little knowledge of the process, either in the design community or in the wider community.

It's an area where we all need to contribute to getting the message out about what we can do. Next time you review your marketing, website or advertising remember to focus on the positives of our process and include a little education by partnering with local universities and schools to have the students come to your plant for a visit. These are just a few of the ways we can all work together to spread the word about rotational moulding and its benefits.

Oliver Wandres

Cover image supplied by

matrix polymers

matrix polymers

NEW MATERIALS – NEW APPLICATIONS FOR ROTOMOULDING

New materials mean that new and innovative products can be produced and this clearly helps rotomoulders grow and become more profitable. The development of new applications is essential for the industry's future health and prosperity.

At the forthcoming ARMO Conference on the Gold Coast in Australia (June 19-21) Matrix Polymers will be showcasing some of their latest polymer developments and giving real-life practical examples of applications these materials can be used for.

This presentation will be made during the first morning of the Conference and will be given by two 'gurus' of the industry, with vast experience of materials for the rotomoulding process, Bloys Rijkmans (Vice President – Technical) and Aldo Quaratino (Technical Director).

Matrix is one of the largest suppliers of rotomoulding powders in Australia and New Zealand with compounding and grinding plants in Brisbane, Adelaide and Palmerston North (NZ) and also in Malaysia. The company is looking to increase its presence further with the expansion of its range of polymers that will be available locally and they hope that this broader product offering will give moulders more choices and will help them to innovate and produce more rotomoulded products.

New materials that will be highlighted in the Gold Coast meeting include a Flame Retardant Polypropylene grade, which is being used in new rotomoulding applications in Europe and a low odour Cross-Link Polyethylene, which is making this very high performance material much more widely accepted amongst the rotomoulding community.
Other materials that will be discussed include the company's hexene tank grade 6329U, which provides security of

supply in case of shortages or supply disruptions of locally made Polyethylene in Australia; a newly developed butene grade which is also made exclusively for Matrix in the Asia-Pacific region; extremely high impact flexible materials for use in making marine buoys, posts and traffic markers; and grades approved for use in diesel and chemical tanks.

Matrix Polymers was a Gold Sponsor and major contributor at the last ARMO Conference that was held in September 2015 in Nottingham in the UK. The company is one of the biggest suppliers to the process in Europe and many products made from Matrix's materials were exhibited at the mouldings exhibition that was held during the Conference.

On display was a 'Bristol Made Cabinet' produced by Rototek in the UK and made from Matrix formulated compound 0.939 density, 6 mfi Polyethylene powders. The product was designed for use in hospitals, so there was a major emphasis on making sure that all surface areas were readily accessible and easy to clean. The mouldings needed to be pin-hole free and have tight dimensional tolerances and minimal warpage.

Stealing the show was a rotomoulded 'e-Raaja' electrically powered 'tuk-tuk' rickshaw, produced by OK Play in India. The whole product is made from Matrix's 6329U hexene 0,939 density, 3.2 mfi, a grade which is also being widely used in Australia and New Zealand for making water tanks of up to at least 30,000 litres in size.

The 'e-Raaja' rickshaw is battery operated and has ICAT approval in India. The material for these rickshaws has to be stiff, easily mouldable and very tough.

Simmonsigns showcased their Simbol illuminated traffic bollard at the show. This product has been successfully providing essential road information to drivers for the past 20 years. The bollard is designed to have multiple impacts and as well as not breaking it needs to reform its shape after being squashed flat! The product is made from a Matrix very low density Metallocene Polyethylene with a density of just 0.880 and an mfi of 30.

Matrix's stand at the conference centred around a rotomoulded bar which was made by Euro3Plast in Italy. This product is entirely pin-hole free and is therefore easy to clean and maintain. The material used is one of Matrix's specially formulated 'Evolve' grades, which are designed to mould out quicker and dissolve bubbles in the moulding to produce a pin-hole free surface.

Going forwards Matrix Polymers is determined to expand the industry through the continued development of new materials and applications. The company has already developed one of the industries widest selections of materials available – from Polyamides, Polypropylenes, Cross-Link Polyethylenes, Super-Linears, foams, conductive polymers and of course a very extensive range of Polyethylene based grades. The company strategy and philosophy was laid out in the opening presentation at the Nottingham Conference by Managing Director Martin Coles which was titled – "The Future of Rotomoulding is Polyethylene – Or Is It?". This video presentation can be viewed on YouTube at https://www.youtube.com/watch?v=mGf2RyH63bI.

The company's belief is that the Rotomoulding industry in Australia in particular must diversify away from its overdependence on water storage tanks. Matrix encourages any moulders who share this belief to contact the company to discuss new opportunities.

matrix®
polymers

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

ESCR – ENVIRONMENTAL STRESS CRACK RESISTANCE | PART 3

Having introduced the various concepts around ESCR in previous articles, this part of my series will describe the mechanics of the most commonly accepted test, ASTM D-1693 – "Environmental Stress-Cracking of Ethylene Plastics". Like most ASTM standards, in my experience anyway, this contains a very clear and readable account of how to set up the test.

The basis of the test is that small coupons of material are subjected to physical stress by introducing a defect (a shallow cut, or nick) on one surface and bending it into a defined geometry. The coupons are then immersed in a warm surfactant (aka detergent) solution that will accelerate failure. The coupons are observed over the period of the test (which can last up to 1,000 hr) and the proportion failing are observed.

The photographs below show the main items of equipment involved.

Fig 1: Overall Equipment Setup

Fig 1 shows the overall setup; a heated water bath containing a number of transparent test tubes. Inside each tube is a strip that holds a row of bent specimens in place and the tubes are filled with a solution of the surfactant nonylphenoxy poly(ethyl-eneoxy) ethanol (tradename: Igepal).

Fig 2: Components & Tools used for Test
(l-r: nicking jig, bending and transfer tool, test tube, holding strip)

Fig 3: Specimens – Unfailed

Fig 3: Specimens – Failed

Fig 2 shows some of the individual components and tools required.

Fig 3 shows a tube of 10 specimens; it will be observed that, thus far in the test, all of the specimens are still intact and none of them have failed.

Fig 4 shows a tube where all the specimens have failed; they have cracked at the point of maximum stress in the bent sample, at the crown of the bend.

It is quite common, at some points in the test, to observe that some specimens in a tube have failed and that some have not. The tubes are examined at specified time intervals from the start of testing and the number of coupons that have failed at that time is recorded.

The ESCR for a material is usually expressed as the time (expressed in hr) that is calculated for 50% of the samples to have failed.

Typically, sample coupons are tested in two different solutions of surfactant: 100% and 10%. It is important to note that a 10% solution is a significantly *more* aggressive environment than the 100% solution. Although this is counter-intuitive, it means that samples will survive for much longer time periods in a 100% solution than in a 10% solution. If a material supplier is only offering you test data at 100% solution, my advice is to insist that he provides you with 10% test data as well!

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

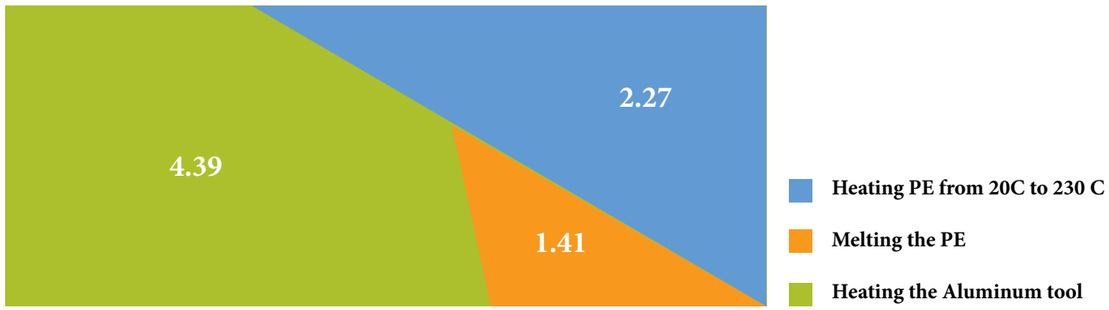
Where Does All The Heat Go?

Rotomoulding is an energy hungry process using in the region of 5kWh/kg to convert material.

So where does all this energy end up and why is there so little ending up in our rotomoulded products? (this is actually a trick question as there is actually no energy left in our products)

When the sums are worked out the total energy required to convert raw material is 8.1MJ per 1m¬2 of 5mm thick LDPE part when moulded in an 8mm thick aluminium tool. The pie chart below illustrates where the energy is used.

Minimum Energy Required (MJ) to Rotomould 1m2 of a 5mm Thick Part in an 8mm thick Aluminium Tool: 8MJ



Not surprisingly most of the energy is needed to heat the tool but there is not much we can do about that: we need the heat to go through the mould! Remarkably the energy needed to melt the PE is 60% of the amount that is needed just to heat it up to a serviceable temperature. Although there will be certain advanced processing techniques that will lower this minimum energy requirement to rotomould (such as inner mould pressurisation) when compared to how much energy is poured into the system from the burners these savings are not the most significant to be had.

Let's look at these losses:

1. During cooling all the heat energy is lost to the environment …could this not be recovered and used to pre-heat powder?
2. The oven walls store a certain amount of heat and then begin to lose it through the insulation…check that there is enough insulation used. Minimise leaks and seal up any gaps around the doors.
3. The steel arms can weigh up to 500kg. When heated up to 200C and then cooled down to 50C they will transport 37MJ of energy out of your machine...why not insulate the arms?
4. Open oven doors lose heat…so turn off your re-circulation fans.
5. Your burner is the source of all your losses…turn it off when not in use.

Increase the product output:

1. Fit more moulds on the arm.
2. Shorten cycle times with improved airflow.
3. Use internal mist cooling.

"I cannot think of a more sobering thought than all the energy we use going up the chimney…"

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

The Ogo

Rotomoulding Could Be The future of Mobility

The Ogo is a new take on personal transportation for those confined to a wheelchair. The New Zealand product has been developed as an intuitive hands free control system, for freedom of movement and maximum independence. The Ogo idea started when Designer, Kevin Halsall, began working on the prototype when his best friend, Marcus Thomson was left paraplegic after a skiing accident. The unique feature of the Ogo is the active moving seat control system, which makes it very intuitive to use - completely hands free! It was developed from a Segway and can travel at about 20 km per hour. The user is able to move by simply leaning in the direction they want to travel. TheOgo Also assists in general health by using your core muscles to move, turn and stay in balance - something that has Occupational Therapists very excited. To add extra safety and security, theOgo comes complete with a thumb controlled joystick. By activating a switch, it locks the left and right movement of the seat and transfers the steering control to the joystick for a more conventional feel.

The product isn't only about mobility. By changing to the all-terrain wheels, theOgo becomes an off road monster that can go just about anywhere. Able to tackle soft sand, gravel, rough terrain and inclines, theOgo is smaller, lighter and faster than most other powered mobility devices. It was a finalist in the National Innovators Awards in New Zealand and is in the process of being commercialised. Halsall has designed several other rotation ally Mouldem products and sees the process as an integral part of theOgo. Kevin's goal is to start manufacturing theOgo and then create new electronic products for people with disabilities.

ROTOPLAS RETURNS

THE WORLD'S LARGEST ROTOMOLDING MEETING

CHICAGO

SEPTEMBER 26-28, 2017

www.rotomolding.org/events

Association of Rotational Molders

ARM will celebrate the history and future of rotomolding and our association this year in New Orleans for our 40th Anniversary. We will bring the spirit of New Orleans into our meeting, invite luminaries from the world of rotomolding to join us, and continue to welcome new members and provide everyone with excellent education and take-home value. The parties and surprises we have planned for our 40th Anniversary celebration are not to be missed.

Join us September 24-27 luxurious New Orleans Marriott for an unforgettable French Quarter experience. Nearby attractions include the National WWII Museum, the Audubon Aquarium of the Americas and the bustling French Market. The ARM Room rate is $179/night and is available by calling 504-581-1000.

A few of the education topics at the Annual Meeting include:

- 40 Years of ARM: What We've Learned
- The Next Forty Years of Rotomolding
- Case Study: Completed EU Projects: Non-Destructive Leakage Testing and Automated Hot Plate Welding of Automotive Parts
- Case Study: An Ice Machine Converted to Rotomolding and Winner of Product of the Year
- Alternative Materials Available For Rotomolding Now
- What Rotomolders Can Learn from Other Processes
- Top Reasons for Part Failure: Avoid the Quality Traps of Rotomolding
- Machine & Mold Safety
- Secondary/Finishing Safety
- New PowderKing Velocity Series Pulverizing System

Our Keynote Speaker Dennis Snow is a world-class presenter on the customer experience and he will change the way you think about your business. His customer service abilities were honed over 20 years with the Walt Disney World Company. There he developed his passion for service excellence and the experience he brings to the worldwide speaking and consulting he does today. He worked at the Disney Institute and Disney University. As a full-time speaker, some of his clients include American Express, Johns Hopkins Medicine, ExxonMobil, and Nationwide Insurance.

Don't miss this amazing event. Visit www.rotomolding.org/events for more information.

Be sure to visit the ARM Blog, where we have recently featured articles from ARM President Conchita Miranda, Gareth McDowell, and Tom Caouette on Stern Companies' proactive safety initiatives. New blog posts also include how one rotomolder and one professor have been teaching design students about rotomolding for 20 years; and a remembrance of Lothar Zillian. All of this and much more at https://blog.rotomolding.org/

Association Francophone du Rotomoulage

THE BENEFITS OF ROTOMOULDING

We adopted rotomoulding technology in the 80's, to implement a new concept in the manufacturing of insulated containers. Rotomoulded polyethylene rapidly demonstrated its qualities: rotomoulded insulated containers are solid, ergonomic, and offer a high insulation value.

We developped two product ranges : ROLL (cabinets with front opening) and BAC (chests with top opening) and is designed for the transport of products under temperature control. Different refrigeration systems are offered, such as eutectic, cryogenic and thermo-chemical systems, allowing the required temperature to be maintained, whether it is chilled or frozen, for a period of 24 hours and more.

Our technology enables our rotomolded products to double its lifetime compare to similar containers.

Double walls monobloc moulding guarantees the best protection of the insulation material. The isothermal value hardly deteriorates over time while the container lifetime gets much longer.

Our 100% plastic design meets all industrial and customers' requirements with performance exceeding ATP regulations.

On the top for major logistics operations, Olivo offer a semi-automated cryogenic refrigeration process called Siber System®.
The Dry Ice is produced at the warehouse from liquid CO2 stored in a refrigerated bulk tank.
The Dry Ice need is calibrated and injected directly into the Siber System® tank positioned in the top part of the ROLL.

This cryogenic process includes the Dry Ice injection station, adjusting automatically the injected amount of Dry Ice according to specific operational conditions.

Our family-owned business has an annual capacity of 50,000 containers and the customer list includes such well-known names as Boots, Aldi, Tesco Lotus, Colruyt, Netto, Carrefour, Casino, Palmer and Harvey, Waitrose, Ocado, and many other leading operations in the distribution of temperature sensitive products –frozen, chilled or fresh food, bakery products, pharmaceutical products, frozen pet foods and so on.

COOLPAC (based in Melbourne) is the distributor of OLIVO containers in Australia. Contact : enquiries@CoolPac.com

ARM/ARMA Joint Executive Meeting 2017
Maui, Hawaii 26-28 March

ARM & ARMA are bringing the rotational molding industry together in Hawaii for a World's First Joint Executive Meeting in March 2017. Aimed at Senior Managers, Business Owners and decision makers in the rotomoulding sector, this will be a professional development and networking opportunity unique in the world and one you can't miss.

The program is currently being collated and will focus on international networks and business management specific to the rotational molding sector.

If you consider yourself a leader in rotational molding, put the dates in y our diary now and we will see you in Hawaii 26 – 28 March 2017.

www.hawaii2017.com

CHINA & HAWAII 2017 ROTOTOUR 19 – 28 March

Each year, we try to provide a totally different experience on Rototour, and in 2017 we will be heading to China. Rototour first visited China in 2005 with over 120 people but there has been so much change and advancement within the industry that it is time to do it again and see what changes the last decade has brought.

There will be a range of factories included on the tour in three main centres of China. Beijing, Shanghai & Guangzhou. You can expect to see custom moulding projects and joint ventures from around the world including kayaks, military cases, water tanks, chemical tanks, huge rotolining project, machinery and mould manufacturers.

At the end of the China portion we will fly over to Hawaii to attend the ARM/ARMA Joint Executive Meeting and finish the busy tour time off in a more relaxed atmosphere.

Information on the tour will updated regularly on
www.rototour.com

ROTOMOULDING IS ...CAMPAIGN

At the conference on the Gold Coast ARMA will be launching their new "Rotomoulding Is" campaign, designed to highlight the breadth of products possible with the rotational moulding process. Featuring products from around the world and showcasing different surfaces, colours, technical complexity and materials the campaign includes a series of posters for reception areas & boardrooms, an accompanying brochure and an online video for members websites. Throughout the next year different hero images will be added, allowing members to choose the image they prefer and order the campaign materials either in hard copy from ARMA or electronically to arrange printing directly with their supplier in the number they require. We have included an example of some of the amazing images here. If you would like to know more about the campaign contact ARMA info@rotationalmoulding.com

ARMSA ROTATION, STUDENT DESIGN & PRODUCT OF THE YEAR COMPETITION







ROTATION 2016 took place earlier this year and was a resounding success thanks to the ever increasing international flavour. "The papers were of the highest quality and take away better than ever before!"
-Anonymous

The ever popular Student Design Competition did not take place in conjunction with the Conference this year but has instead been shifted to co-inside with a separate event in September 2016 where the Product of the Year Competition will also be held. This new event on the calendar is sure to bring some surprises and promises to add more value to ARMSA members.

With ARMSA's new slot on the International Calendar moving to March it has created a new opportunity with the timing of the Cape Town Cycle Tour. The event is one of the "must do events" for any passionate cyclist. But be warned it is not one of those events you only do once! The event is the world's largest individually timed cycle race with 35 000 entries completing 109km around the Cape Peninsula on roads that are closed to vehicles giving the enthusiastic cyclists exclusive use to the roads around Cape Town.

With this in mind I would like to extend an invitation to all interested parties to join us for the 2017 Cape Town Cycle Tour and the 2017 ARMSA Conference. We will keep you updated on the developments around Rotation 2017 but the Cape Town Cycle Tour date has been set for Sunday the 12th of March 2017 so the Conference will be taking place within a couple of days of the race. For more information visit www.cycletour.co.za and www.armsa.co.za

Wayne Wiid
ARMSA Chairman

Health and Safety in the Rotational Moulding Industry Seminar

The British Plastics Federation seminar for 2016 took place on 19th May at the County Cricket Ground in Northampton in the heart of England. The focus of this year's event was on Health and Safety in Rotational Moulding.

This event, which was the largest rotational moulding event in the UK for 2016, brought together rotational moulders from over 40 companies from across the UK to discuss this essential issue.
Presentations at this event included sessions from the Health and Safety Executive, Matrix Polymers, Persico and Polivinil amongst others and covered topics including powders, smart technology and the HSE campaign for 2016.

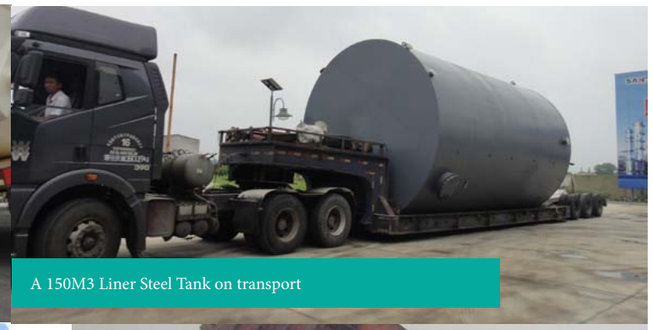
The event also gave companies the opportunity to display their products in table tops in the conference room. This opportunity was taken up by a variety of rotational moulding companies ranging from material suppliers and additive suppliers to insurance providers.

At the event the British Plastics Federation provided an update on its SIMPL strategy and an exploration of the Health and Safety Executive policy for the industry in the UK with a particular focus on the HSE 'Help Great Britain Work Better' campaign. Martin Spencer, the BPF representative on the ARMO Board presented the BPF report on the analysis of the most common causes of accidents in Rotational Moulding. Further sessions at the event included presentations on risk assessments, smart technology and the strategy for polymer powders control.

The BPF holds an annual rotational moulding conference which brings together the entire UK industry. To find out more about the BPF, its seminar and its rotational Moulding group contact Group Executive Dr Sara Cammarano at scammarano@bpf.co.uk

HOW ROTOLINING DEVELOPS IN CHINA

A 50,000L Plastic Tank on transport,
D 3.3m X H 6.39m, Wall thickness 30mm, PE Shot weight 2200 kg



A 150M3 Liner Steel Tank on transport

D 4.2m X H 11.5m, Steel wall thckness 10mm, Steel sheet weighs 14,150 kg, PE shot weight 2,665kg

Liner steel reactor D 10m x H 6m being rotomolded on site
Steel wall thickness 14-16mm, sheet steel weighs 42,670 kg, PE liner thickness 18mm, Shot weight 5,800kg

Rectangular liner steel tank undertaking rotational molding on site of a dockyard, preparing to fit as an array of tanks like this into a ship.

Rotolining can be considered a rotational moulding hybrid as the technique is so developed in China. It is becoming a significant segment, though it is not big at all as compared to the rest of rotational molding industry in the Country. Most of the rotolining companies are located in the Yangtze River Delta Region which is so well knit with rivers and cannels that they serve good transport for the chemical and ship building industries there.

SOLE PE TANK

These Liner Tank companies usually develop themselves first in making huge PE tanks, of 50,000 liters with wall thickness 30mm, shot weight of PE over 2 Metric Tons.

PE LINER STEEL TANK GOOD FOR TRANSPORT

Owing to demand on corrosion resistance storage and transport as well as strength requirements these companies then develop rotational molding of liner on steel tanks, with the technique and skill so specifically developed in China. Sizes of the tanks are usually in the region of 200M3 which is just not too large for road transport. Because most of the rotolining factories are so located around the Yangtze River Delta that has a well knit cannel network, water transport is also used to deliver the liner steel tanks and reactors to the chemical factories nearby.

ROTOLINER TANKS OVERSIZE FOR TRANSPORT JUST ROTOMOULDED ON SITE

However, demand on even bigger liner tanks and reactors is there. They are too big for normal transport means. Therefore the companies employ portable rotomachine which can be moved to the customer's site to make PE liner tanks of any size and shape to meet the customer's needs. Chemical plants could demand a disk-shape reactor of 10m diameter, or a dockyard should need rectangular liner storage tanks to fit without wasting space on broad of a ship.

There will be a presentation on how in China rotolining tanks are fabricated, in particular, how the PE liner is built onto the internal wall of a steel tank.

JAIPUR a historical destination offering medieval FORTS & PALACES

StAR's next annual conference is in Jaipur also known as the PINK CITY. Jaipur ranks high on the India tourism map for its forts & palaces, arts & culture, and gems & jewelry. Blending the glory of a bygone era of the warrior Maharajas with medieval architecture and vestiges of royal splendor. Woven into the sands of time are myriad tales of valour and romance of Kings & Warriors of yore.

Historical landscape has many protected UNESCO World Heritage sites:

AMER FORT – was capital of the princely state of Jaipur, is the most famous fort of Rajasthan. Built in 1592 by Raja Man Singh has influences of Hindu & Muslim architecture. Get to this mountain top fort by elephant ride.

HAWA MAHAL – means "Palace of Winds" is located in the heart of the city. This five storey palace in red & pink sandstone was built in 1799 by Maharaja Sawai Pratap Singh. Pyramid in shape has 953 Jharokhas or windows, allowing royal women a view of daily life without appearing in public. This monument is also an archeological museum.

JANTAR MANTAR – this magnificent solar observatory was built in the 1720s during the time of Maharaja Jai Singh II. This astronomical observatory combines science and art housing world's largest sundial.

CITY PALACE – located in the heart of the Pink City this palace was built in 1730 by Sawai Jai Singh II. The architectural style is a fusion of Rajput, Mughal and European palaces. Also known as "Chandra Mahal" today is a museum.

Complementing the monuments is a unique shopping experience. Rich ethnicity and sparkling colors light up the bazaars. Precious gemstones, silver jewelry, bangles, clothes, textiles and pottery are specialties. Sightseeing & Shopping will be on offer at the conference - good reason to bring along your spouse / family.

- *Jaipur is part of the popular Golden Triangle itinerary along with Agra and Delhi.*
  More information:
  http://tourism.rajasthan.gov.in/jaipur#jaipur-city-palace
- *Palace on Wheels a weeklong luxury train journey to relive the life of the Maharajahs of yore begins from Delhi, touches historical Rajasthan cities on its way to Jaipur.*
  More information: www.palaceonwheelsindia.com

StAR 2017 Annual Rotomoulding Conference will be held from Jan 29 to 31 in Jaipur.
It will offer its fare of educational seminars,tradeshow, conference presentations, along with suppliers cocktail reception and gala dinner with invigorating entertainment

Contact – sbzamanp@gmail.com

UPCOMING EVENTS

2016

JUN 2-3
ROTOPOL CONFERENCE 2016
City/Country: Swieradow Zdroj, Poland
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

JUL 13
ARM TORONTO REGIONAL MEETING
City/Country: Holiday Inn Yorkdale, Toronto, ON
Register now at: www.rotomolding.org/events

JUL
STAR SEMINAR & MUMBAI REGIONAL MEET WITH INSTITUTE OF CHEMICAL TECHNOLOGY
City/County: Mumbai
Further Information: http://starasia.org/

SEP 22
ARMSA STUDENT DESIGN AWARDS AND PRODUCT OF THE YEAR EVENT
City/County: Marriott, New Orleans, LA
Further Information: http://www.armsa.co.za/

SEP 24-27
ARM ANNUAL MEETING
City/County: Marriott, New Orleans, LA
Register now at: www.rotomolding.org/events

NOV 7-8
ARM-CE ANNUAL MEETING
Bad Segeberg & Trappenkamp
Further Information:
www.rotational-moulding.de/

2017

JAN 29-31
STAR 2017 ROTOMOULDING CONFERENCE
City/Country: Jaipur
Further Information: http://starasia.org/

JAN /FEB
NORDIC ARM ACADEMY, TRAINING FOR OPERATORS AND FOREMEN
City/Country: Borås Sweden
Further Information: http://nordicarm.org/

MAR 8-9
ARMSA ROTATION 2017 CONFERENCE
City/Country: South Africa
Further Information: www.armsa.co.za/

MAR 19-28
ROTOTOUR 2017 CHINA
City/Country: China & Hawaii
Further Information: www.rototour.com

MAR 26-28
ARM/ARMA JOINT EXECUTIVE MEETING 2017
City/Country: Maui, Hawaii
Further Information: www.hawaii2017.com

JUN 25-27
ROTOMOULD 2017
City/Country: Melbourne, Australia
Further Information:
www.rotomouldconference.com

SEP 26-28
ROTOPLAS 2017 SEPTEMBER 26-28, 2017
City/Country: Donald Stephens Convention Center, Chicago/Rosemont, IL
Further Information:
www.rotomolding.org/events

Smartwave 4200 boat, produced by David Hickmott & Advantage Plastics, Rangiora South Island NZ from Matrix Rotathene.

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ROTO MOULDER

JUNE 2016 ISSUE 05

AFFILIATES

Association Francophone du Rotomoulage

anipac MÉXICO

RPC-CPPIA
中国塑协滚塑专业委员会

Association of Rotational Moulding (Central Europe) e.V.

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