

ROTO TALK

Quarterly Newsletter of Society of Asian Rotomoulders

Editorial Comment

The colour and diversity of life in every Region of India is quite fascinating. Conditions for rotomoulding also vary from region to region. The recent Kochi Regional Meet on July 11 provided perfect opportunity of enjoying the unique beauty of the region alongside the serious business of addressing its rotomoulding issues. The trip to the Athirappilly Waterfalls near Kochi set the mood for a very productive day of Seminar & Presentations at the Meet which followed. The idea of having a fuller date with a region at StAR Regional Meets has now caught on for Ahmedabad, venue of the next Meet on Oct 15.

Dear Reader

The successful Regional Meets held this year in Pune & Kochi, with Ahmedabad to follow are proving to be a good lead up to StAR's Annual Conference to be held in Goa from Feb 1 to 3 next year. Feedback at the Meets has been a pointer to their usefulness for attendees; they have high expectations of learning & networking from the Goa conference. Goa which has always proved popular with both domestic and foreign attendees of our conferences will be host city of a StAR annual conference for the 4th time. The conference venue is a beautiful beach resort in South Goa.

It has been heartening to see good response to StAR's " Call for Presentations " for the conference. To add to it with a full scale Trade show with option for octonorm stalls and table top booths in the plans attendees can look forward to another typically satisfying Goa conference experience.

This also is a busy time at StAR as the biggest ever StAR group to participate in an international rotomoulding conference prepares to leave for ARMO2015 conference in Nottingham, UK. Multifaceted participation as sponsors, exhibitors and delegates from StAR is a true reflection that the rotomoulding industry of the country is in sync with the overall economic outlook....on the upswing.

S B Zaman
StAR Executive Director

R P Shukla
StAR President

KOCHI REGIONAL MEET



Meet Attendees

Encouraged by the interest taken and the intensity of participation by local moulders in the Regional Meet of the previous year, StAR held a Regional Meet in Kochi on July 11, 2015.

The notable difference this time for the full day programme of pre lunch Seminar and post lunch Presentations was the new found optimism in the industry. This arose from the substantially improved business sentiment in the Indian economy.

The positive atmosphere was not the only difference for the Meet; a new development which promises to be a precedent for Regional Meets to follow was the activities to promote camaraderie among the participants. These were held on the day previous to the Meet and as part of Cocktails / Dinner / Networking of the Meet. The new group spirit generated a lot of enthusiasm in the proceedings of the Regional Meet itself.

10th July Athirappilly Waterfall trip

Seven Meet participants joined Raphy John of Evolve Polymers who



By the waterfall

played gracious host and organized the trip to Athirappilly Waterfalls about 40 km away from Kochi .

The concept of multiple point viewing of the waterfall, a different dimension every time, by itself was so much fun. It involved all kinds of up & down walks to get close to the water & the sumptuous typical Kerala food for lunch with beer gave the taste of the place. An exotic snack with tea at the end of the trip was also quite an experience.

It is hoped people will now get attracted to this aspect of Meets. Swetang Dave & Ravi Kadiwar champions of the next regional Meet in Ahmedabad have taken the cue because of which the outstation attendance numbers should rise.

The birthday party of Ashish Baheti in which Sarika & he chose a close by resort as dinner venue added to the fun & enjoyment, spirit of togetherness and the momentum of the Meet. 10 Meet participants were present.



VENUE : Holiday Inn Beach Resort, South Goa

- Feb 1 - Seminars**
Evening Suppliers reception
- Feb 2 – Conference Presentations**
Evening Gala Dinner & Entertainment
- Feb 3 – Conference Presentations**
Afternoon Vaedictory Tea session

SPECIAL CONFERENCE HOTEL ROOM

RATE : Rs 8000 for single / double occupancy

Contact for more information : sbzamanp@gmail.com
www.starasia.org



Sea side view of Holiday Inn Beach resort, South Goa



Table Top Trade Show



Ashish Baheti

ANTI MICORBIAL MASTERBATCHES

**"Where theres a will, there is a way"
and
"Where there is moisture, there is bacteria"**

There is no uncertainty in the certainty of the above 2 statements.

Rotomoulded products find use in water rich environments more than any other processes. Growth of bacteria, algae, fungus etc pose a health hazard and are detrimental to aesthetics.

There is a vacant space in the minds of hygiene and wellness driven consumers that is waiting to be occupied by products that can address this microbial menace.

I write this today in the context of the years of work done by us at Alok in this field. From the early days of organic traditional antimicrobials like Triclosan to the fabled silver ion based technologies there have been 3 critical impediments to the use of antimicrobial additives in plastics.

- **Toxicity:** For water tanks, pipes, pools, sanitary products that are in frequent contact with water and humans, it is imperative that the antimicrobial activity is limited to harmful microbes and not human health. Organic antimicrobials have been under the lens due their alleged harmful effects on human and animal health.



- **Migration of the additive from the plastic to the surface:** Till now, the activity mechanism of the antimicrobials has been due to their migratory nature. The additive is contained within the polymer matrix in a pool and is slowly released to migrate to the surface of the plastic. This means that any water in contact with the surface of the part will be contaminated with this additive. We do not have enough vintage on the empirical data of how this contamination affects the human health to discount any misgivings in the consumers minds.



Would you as a consumer be comfortable drinking or bathing with water that you know has powerful micro-organism killing additives?



Nano Rocks ECS Fungus growth

Seminar & Presentations

The salient facts of Kochi Regional Meet:

- Attendees:** 34
- Moulders:** 13
- Local moulders:** 9
- New member** – 1 injection moulder entered roto industry & joined StAR.
- Sponsors** – GreenAge Industries Ahmedabad & GAIL India Ltd Bengaluru.

Feedback of some attendees interestingly stated that the ones who did not come would really regret their absence when they hear about what Ashish Baheti of Vectus spoke during the seminar. This is against the background where the entry of Blow moulding into the water tank market has been a matter of great concern among rotomoulders.

All the doubts about whether it was prudent to talk about anything controversial – Roto Vs Blow – was set at rest, as Ashish was heard most eagerly & keenly with great attention. He spoke uninhibitedly, and said nothing negative about either process.

Salient points were:

- There are 70 Blow moulding water tank manufacturers / 100 machines in the country & they will continue to grow
- His own experience – growing in both BM & RM water tank manufacturing
- BM does face low ESCR & high (40) scrap problems
- Solutions are also found to above problems, like he does in use of scrap in manufacturing low cost single layer tanks & in HDPE pipes
- **3 categories, he predicted will crystallize in water tank manufacturing**
 - Cheapest category of rotomoulded tanks using low quality, even reprocessed material
 - Blow moulded
 - Superior quality rotomoulded tanks using CNC & may be Cast aluminium moulds for value additions like special surface textures & finishes

The co – ordination between the 3 seminar Speakers, Umakant Savadekar, Swetang Dave and Ashish Baheti ensured systematic & logical progression of the seminar.

In the Presentations the speakers factored presentations of others in what they said which was extremely good team work through the afternoon.

Topics & Speakers of the day are listed below. Swetang and Ashish held a Q & A session at the end at presentations.

Topics & Speakers

SEMINAR - Rotomoulded Water Tanks: The Way To Go!

Water Tanks Market Scenario in South India

By Basil Abraham, Carris Pipes & J.Kirubaharan, Ideal Polytechnologies

Resins for Rotomoulding & New Opportunities

By Rajesh Kumar, GAIL Bangalore

Value addition through speciality compounds

By U. Savadekar, Phychem Technology

Tubs for Fisheries & Other Marine Products

By S. Dave, Consta Cool

Business Opportunities in Rotomoulding Applications

M. Amutharasan, IOC Chennai

Lighter side of Tanks

By V.Mahadevan, Matrix Polymers

Challenges & Opportunities for rotomoulding with focus on Swachh Bharat Abhiyan

By Saptarshi Mondal, Reliance Industries

StAR Presentation - ARMO2015 & StAR 2016 in Goa

By S.B.Zaman

Q & A by A. Baheti & S Dave.



Ashish, Swetang & Venkit

Cocktails & Dinner

At Cocktails & Dinner all groups of people - moulders & suppliers; locals & out station participants – interacted and got an impromptu musical session flowing till the late hours which was quite an experience.

The success of the Kochi Regional Meet especially the value additions around it has motivated host companies of the next Regional Meet in Ahmedabad on October 15, 2015 to think up new ideas to provide participants a memorable experience

S B Zaman

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International Rotational Moulding Conference



www.armo2015.com

CREATE | INNOVATE | ROTATE

StAR Presentations: Sep 14 Mon

StAR India : Leveraging Growth Opportunities in India

Ravi Mehra, StAR

Computational Tools For A Never Before world

Mohit Shukla, MPlast India

Pre - Event Seminars

09.00 - 16.00 Saturday 12th September

09.00 - 17.00 Sunday 13th September

ARMO Trade Exhibition

6.00 - 18.30 Sunday 13th September

08.30 - 17.00 Monday 14th September

08.30 - 15.30 Tuesday 15th September

ARMO Welcome Drinks

17.00 - 18.30 Sunday 13th September

Networking Lunch

12.30 - 14.00 Monday 14th September &

Tuesday 15th September

ARMO Dinner

19.00 - 23.00 Monday 14th September

StAR Group Dinner

Evening Tuesday 15th September



Non permanent effectiveness of the additives:

- A roto moulded product has a life cycle expectancy that usually exceeds most other processes. It is expected that any performance promises made for the product last as long as the product lasts. You cannot have your antimicrobial efficacy stop after 2 years while your customer has bought the product for use with a 5 year lifecycle. Non permanency has afflicted all traditional antimicrobials and hence there are no promises that the brands and processors have been able to make to the consumers. At Alok, our R&D team has finally overcome these 3 critical impediments with our antimicrobial masterbatch range, BactiSafe!

a) Bactisafe is non toxic and based on FDA compliant additives.

b) Zero Migration: The boiling water test is one of the most gruelling measures to check for migration. The test involves plastic plaques with Bactisafe being boiled in water for 30 days continuously. At the end of the 30 days the water was tested for residual additive content which was found to be zero. The plaques were tested for gram +ve and -ve bacteria tests and were found to perform the same as before the test began. There is no risk of contamination with use of Bactisafe.

c) Permanent Efficacy: Bactisafe’s permanent nature allows you to give long term antimicrobial efficacy guarantees. Bactisafe will outlast your products service life.

Bactisafe is guaranteed to kill 99% of the microbes and keep your products clean and hygienic year after year after year!

For more information on Bactisafe products and usage guidelines, pls write to us at info@alokindustries.com

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Use of antioxidant in Recycling / Reusing of in-house wastage:

By the use of Antioxidants with adequate quantity of reprocess / recycle / or plant waste in appropriate dosage with virgin LL roto polymer can enhance / retain the properties of polymer by further degradation. It is very useful in water tank industries where we have to consume our in-house wastages.

Chemistry of Antioxidants:

- Primary & Secondary AO's: Hindered Phenols – For Odor control & For protection from thermal degradation
- Performance Criteria : Efficiency of Control of degradation.

Multiple extrusion pass for evaluating the antioxidant performance (Multipass):

This test evaluates the effectiveness of an antioxidant in helping a resin to withstand thermal degradation. Known amount of antioxidants in form of MB are added in a resin and extruded repeatedly on extruder. the sample collected after each pass is tested for MFI and yellowness index.

By adding antioxidants in extrusion (compounding) stage, you may always get better Oxidative Induction Time (OIT). That is measure of better product.

The OIT analysis exposes the melted PE Rotomolded specimens to an Oxygen environment at 200 degree C for over 2 hours. The DSC machine monitors change in the energy transfer rate to or from the specimen because of chemical reactions.

How to find out degradation physically:

Heating time (increasing order)	Colour of moulded product
X1	Powder White
X2	Fusion almost completed, Wavy surface
X3	Fusion completed, surface almost flat
X4	Absolute flat surface, colourless
X5	Becomes Yellowish
X6	Increasingly Yellowish
X7	Yellowish
X8	Yellow
X9	Brownish, degrades

For sustainability, Rotomoulders have to update their process, use advance techniques, machineries, use better material and have to focus in to Custom moulding products.

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PRODUCT ENHANCEMENTS BY THE USE OF ANTI-OXIDANTS IN ROTOMOULDING PRODUCTS

Much of the current research is into reducing the cycle time, as well as improving part quality. Due to high temperatures within the mould the plastic must have a high resistance to permanent change in properties caused by heat (high thermal stability). The molten plastic will come into contact with the oxygen inside the mould—this can potentially lead to oxidation of the melted plastic and deterioration of the material's properties. Therefore, the chosen plastic must have a sufficient amount of antioxidant molecules to prevent such degradation. Once this antioxidant is consumed, the inside surface of the moulding will begin to oxidize and small cracks may be created. This over-fusion is easily recognized by a glossy inner surface, a yellow discolouration, and a strong odour. As the degradation proceeds, physical properties such as Impact strength and ESCR will be seriously impaired.

Where to use additional antioxidant:

Open flame / Close oven rotomoulding process; where powder has to undergo prolonged heating cycle that may cause thermal degradation in product. To avoid degradation, we should add antioxidants for better products.

For Thick-walled and Large- size High density products ; additional antioxidant may take care strength / cure degradation.

FLOW PROMOTER

Flow promoter is a new product introduced to the global rotational moulders. It took more than two years to develop this product as Engineers in R&D worked with Technical rotational moulders in Europe to make it technically superior.

During the heating and melting cycle of rotational moulding process, the resin at times has difficulty in reaching and remaining in some areas like parting lines and moulded in threads. This may lead to formation of pin holes, poor edge definition and other blemishes affecting the appearance and look of the final product.





Flow promoter effect on Fuel tank part

Flow promoter is specially developed to solve this problem. When it is applied on Mono coat release agents it maximizes the operational efficiency and product appearance. Flow promoter is available in Aerosol cans allowing ease of usage and will dry fast on the mould with very little transfer to the moulded part. Chem – trend is proud to have added this to its product range.

Hari Kunnathu,
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CARBON BLACK – EXCELLENT UV STABILISER

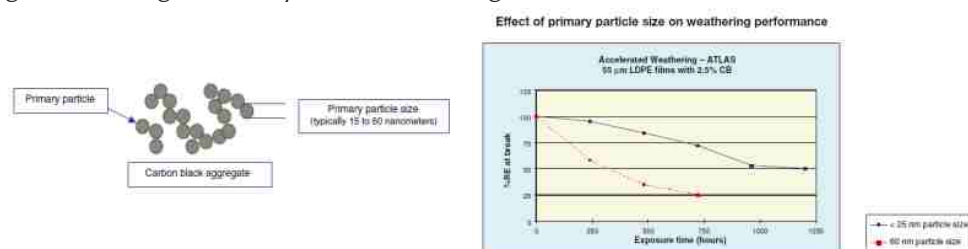
To provide an appropriate protection against UV radiation, several stabilizing systems can be utilized in plastic materials. As we have already discussed the most important types of light stabilizers are Ultraviolet Light Absorbers, Energy Transfer Agents or Quenchers, as well as Hindered Amine Light Stabilizers. Absorbers convert harmful ultraviolet radiation to harmless Infrared radiation or thermal energy, which is dissipated through the polymer matrix. They can be either transparent as hydroxybenzophenone or opaque like carbon black

Carbon Black is most popular and cost effective UV stabilizer for plastic and rubber. The strong absorption characteristics and high opacity of carbon black make it the most cost effective UV absorber. Typical applications for carbon black as a UV stabilizer in plastics are exterior pipe, tanks, polyolefin agricultural film, pond linings, automotive parts and exterior cable jacketing (PVC, PE, etc...).

Research and experimental data has shown that the tensile strength of natural material (no color added) falls below 50% in less than 6 months of exposure. With addition of carbon black, even after 30 months exposure, the product still retains more than 90 % of its strength. This clearly illustrates the effectiveness of carbon black as an excellent UV stabilizer. The appropriate loading level depends on the part thickness, exposure conditions and type.

It is experimentally proven that 2- 3 % addition of carbon black gives best result. So you need to add carbon black master batch in quantity so as to get desired carbon black in final product. Expected life of Single Layer all black tank with 2.5 % carbon content is more than 15 years.

Its efficiency as a UV absorber depends primarily on the primary particle size and structure. At the same loading, carbon black aggregates based on fine prime particles will present more surface to incident light - and hence a larger ultraviolet light absorbing efficiency - than a coarser grade.



If the carbon black is poorly dispersed or diluted, its full benefit will not be realized. Rotational moulding process does not contribute much to dispersion of carbon black as rotational moulding is very low shear process. It is highly advisable to achieve proper dispersion during compounding. Dry blending of carbon black with LLDPE powder in high speed mixture is not right way of dispersion and should be avoided.

Even though black tanks tend to have a higher overall temperature than light or white tanks, the UV protection from carbon black outweighs any temperature effects, as demonstrated by the superior retention of properties upon exposure. The benefits gained in extending the life of the tank and reducing the possibility of catastrophic failure due to the degradation of the plastic, make carbon black the preferred pigment, especially for higher-end applications.

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ROTOMOULDING CALENDAR

Event	Date	Venue
Rototour 2015 Great Britain	6th - 15th September, 2015	UK
ARMO 2015, Nottingham	13th - 15th September,	Nottingham, UK
StAR Regional Meet	15th October, 2015	Ahmedabad
StAR Annual Rotomoulding Conference	1st -3rd Feb, 2016	Goa (India)

StAR Heartily Welcomes its New Members

Company	Category	Contact
Gail India Ltd (New Delhi)	S	Manish Khandelwal
Esquire Multiplast (P) Ltd (Kochi)	M	K.P Nelson

PE VS XLPE IN ROTATIONAL MOLDING

Polyethylene (PE) is the most common plastic. In rotational moulding process LLDPE, MDPE, HDPE are most commonly used resins.

Cross-linked polyethylene (XLPE) is a high density polyethylene containing cross link bonds introduced into the polymer structure, changing the thermoplastic into a thermoset. Cross linking can be done using a chemical reaction or radiation. In rotomoulding crosslinking is done using an additive which initiates the crosslinking process in the polymer chain during the moulding process.

In case of rotational moulding process, crosslinking is initiated by heat/temperature and is time/temperature dependent.

Crosslinking in PE results into a higher Heat Deflection Temperature (HDT) at about 66.6 ° C making it suitable for higher temperature application. Though not fire retardant in nature, the product can also withstand open flame for a short duration without dripping or failure. Crosslinking also increase the chemical resistance properties. The impact properties and Environmental Stress Cracking Resistance (ESCR) goes up substantially making it suitable for most demanding applications.

The popular applications are Automotive Fuel Tanks, Hot Air Ducts, Chemical Tanks, Large Tanks, Underground Tanks, Toilets Blocks, Industrial Products, Kayaks etc.

Advantages of XLPE in rotational molding :

- ➔ Much better stiffness and toughness balance.
- ➔ Better – 40 ° C impact resistance with ductile failure mode.
- ➔ Wider rotomolding operation window with the ability to resist overcook
- ➔ Superior adhesion between XLPE skin and PU foam interface.
- ➔ Superior abrasion/wear resistance than Linear PE.
- ➔ Better high temperature resistance.
- ➔ Better creep resistance under constant load – better dimensional stability.
- ➔ Superior stress crack resistance – prevention of notch propagation failure.

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Underground tank



Automotive fuel tank



kayaks

Rototalk is the Newsletter of Society of Asian Rotomoulders (StAR) for internal circulation only.

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