

ROTOTALK

Quarterly Newsletter of Society of Asian Rotomoulders

Editorial Comment

StAR commenced Regional Meets for year 2018 at Mumbai on April 13 in its successful format of seminar in the morning followed by presentations in the afternoon. The seminar on **Process Development & Trouble shooting** struck an immediate chord with attendees; enough to encourage the speaker duo Swetang Dave & Umakant Savadekar to plan re-runs with more value additions in future StAR Regional Meets. The package of seminar attendee handouts, with booklets for technical personnel and posters for the shop floor along with the liberal use of Hindi to simplify explanations took overall involvement and interaction to an altogether new level. This bodes well for StAR's quest to hit the right buttons to combine utility and clarity when communicating technology....

Dear Reader

When the climactic annual conference on StAR's calendar of activities notches new records it takes renewed efforts to match up with activities in the year to follow.

Fortunately good interest levels for the membership and the industry have been sustained in planning new content for our Regional Meets and for treading into new exciting territory for our annual conference and regional meets in 2018 - 19. There could not have been a better venue than God's Own Country - Kochi in Kerala for Conference 2019. For regional meets we have a leading Goan national technical campus - BITS Pilani and the principal centre of commerce in the country's fascinating North East region - Guwahati. Adding to the interest in the regional meet on the Goa campus is the fact that StAR and BITS have entered into a collaboration involving multiple projects which would lead to the setting up of a Centre for Rotomoulding Excellence.

Domestic activities alone are not grabbing the attention of StAR members. A StAR group is also building up to attend ARMO 2018 Conference in Hamburg from September 16 to 18 later this year. Close to 15 in numbers already, a Bronze sponsor and two exhibitors included the group is getting well set to represent a fast progressing region for rotomoulding and bring home new ideas from the conference & accompanying exhibition. Staying together in a designated hotel and signing off with a group dinner on the last evening of the conference will add to the spirit of togetherness of the group. Until the next time, Happy reading, Dear Reader.

S B Zaman
StAR Executive Director

M Ambani
StAR President

StAR REGIONAL SEMINAR & MEET AT MUMBAI

The first regional seminar & meet of StAR for the current year was held at the MIG Cricket Club Bandra, Mumbai on April 13.

The Regional Seminar from 11 am to 2 pm was preceded by Welcome remarks by StAR President Mukesh Ambani & self introductions by all present. A slide presentation was made of the recently held StAR annual conference which had set record numbers for attendees and exhibitors. Topic for the seminar by **Swetang Dave** - Consta Cool & **Umakant Savadekar** - Phychem Technologies was

Processing Developments & Trouble Shooting Swetang Dave covered essential awareness and knowledge of various processing aspects following design of the part, through the entire gamut of production stages with appropriate corresponding parameters. He shared from personal experiences and talked about some typical contemporary Indian products.

Following the break for tea Umakant Savadekar discussed common problems faced in day to day rotomoulding and the way to trouble shoot for possible solutions, in highly interactive mode with attendees,

Handling the parting line was seen by both speakers and attendees as full of complexities and thereby meriting to be the topic of a full presentation by an expert at the 2019 StAR annual conference.

After a break for lunch the regional meet resumed



Swetang Dave

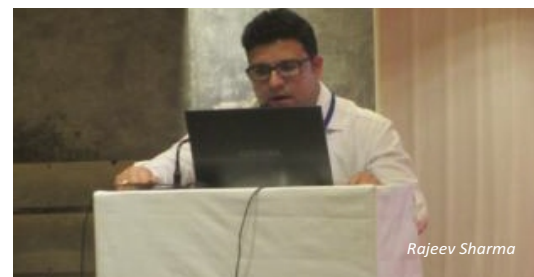


Umakant Savadekar

with presentations on a variety of topics carefully chosen for their relevance to the region. These presentations were:

- Indelible Graphics By Rajeev Sharma - S S Polyfusion
- Human Machine interface HMI for a Rotomoulding machine By Divya Raithatha - Vinodrai Engineers
- Advantages of using Specialty materials for special applications By Venkit Mahadevan - Matrix Polymers India
- Product Design, Information exchange & Mould making By Mohit Shukla - MPlast

- Defining Quality Rotomoulding Compounds By Ravi Kadivar - Greenage Industries
- Solution to enhance gloss on Rotomolded products with MS mold By Linal Amalraj - ChemTrend India
- Factors affecting product quality - Role of additives By Dr Jitendra Kapadia - BASF India
- Rotational moulding part designs - Guidelines By Ravindra Waykole - Design Consultant
- StAR presentation & ARMO 2018 in Hamburg By StAR President M Ambani & StAR Exec Director SB Zaman



Rajeev Sharma



Divya Raithatha

V Mahadevan



Among the presenters Dr Jitendra Kapadia of BASF for many years a regular speaker on the regional meets platform of StAR was returning after a long gap and the interactions of the audience with him showed how much he had been missed.

Divya Raiththatha of Vinodrai Engineers and Design Consultant Ravindra Waykole who were making their debut on this StAR stage were well received for their presentations by the attendees. Q & A and interesting discussions had followed after most of the presentations while several attendees left behind positive feedback and suggestions in the feedback forms they filled up. Some of the non members showed interest in joining the membership of StAR.

Meet Sponsors MPlast, Greenage Industries, Arihant Plast and Chem – Trend were thanked for their valued sponsorship, consistent support and encouragement to StAR activities.

A total of 45 attendees were present at the Meet. These consisted of 27 moulders, 17 suppliers and 1 designer. There were 36 companies represented.

Networking, Cocktails & Dinner followed to bring the Meet to a close.

S B Zaman
StAR
sbzaman@gmail.com

ARMO 2018 IN HAMBURG – RARE GLOBAL MEGA ROTOMOULDING CONFERENCE

„Function meets design“

ARMO INTERNATIONAL CONFERENCE 2018

Universität Hamburg, 16.-18. September 2018

The ARMO 2018 Conference in Hamburg, Germany from 16 to 18 September 2018 is proving to be a special attraction for StAR members. A StAR Group has already been formed and about 15 attendees have already registered and booked hotel rooms. Member companies like MPlast (also bronze sponsor & exhibitor), Reinhardt (also exhibitor), Frontier Polymers, Design Directions, SS Polyfusion – Brilsol, Kentainers, Nilkamal have already registered led by StAR Founding Chairman Ravi Mehra. Sintex, Infra, StAR Executive Director among others would be registering soon.

The organizers have specially blocked rooms for the StAR Group at the reasonably priced Hamburg Mercure Mitte which is in close proximity to the conference venue. StAR has planned a group dinner for the group on the last evening of the conference. StAR office is helping in co – ordination for the trip including forwarding requests for visa invitation letters to attend the conference.

50 presentations
that's a lot of information

+45 different countries
... truly international

+1000m² exhibition space
so much to see ...

100%
Total success!

+600 attendees
a pretty good crowd

PROGRAM	
from 10.00 am to 05.00 pm	we will offer 2 – 3 workshops (being held parallel) The workshops are optional to registration of conference attendance
Workshop 1:	“Upliftingconventionalrotomoulding” by QueensUniversityofBelfast MarkKearnsundMarkMcCourt
Workshop 2:	“ProcessControlsinRotomoulding” by493K;Dr.GarethMcDowell
Workshop 3:	“FEAAalysisisonrotomouldedproducts”
at 05.00 pm	official welcome and start of the conference in the networking / exhibition hall
to 07.00 pm	Welcome Reception + pre opening of the exhibition floor (5 to 07pm)

Monday, 17. September 2018		Tuesday, 18. September 2018	
9.00 am - 10.30 am	presentation block AI	9.00 am - 10.30 am	presentation block BI
10.30 am - 11.00 am	coffee break/exhibition	10.30 am - 11.00 am	coffee break/exhibition
11.00 am - 12.30 am	presentation block AII	11.00 am - 12.30 am	presentation block BII
12.30 am - 1.30 pm	Lunch + exhibition	12.30 am - 1.30 pm	Lunch + exhibition
1.30 pm - 3.00 pm	presentation block AIII	1.30 pm - 3.00 pm	presentation block BIII
3.00 pm - 3.30 pm	coffee break/exhibition	3.00 pm - 3.30 pm	coffee break/exhibition
3.30 pm - 5.00 pm	presentation block AIV	3.30 pm - 5.00 pm	presentation block BIV
6.30 pm	boat tours to	to 5.30 pm	exhibition
7.30 pm	Galadinner at the Old Customhouse of Hamburg		end of conference
... 11.59	<i>drive back to hotels</i>	<i>from 5.30 pm</i>	<i>dismantling of exhibition</i>

On both conference days, Monday and Tuesday, we are planning for 8 presentation blocks. With a total of 12 hours there will be approximately 40 presentations to the following main fields:

- ✓ case Studies to product design
- ✓ material and appearance
- ✓ process- and quality improvements
- ✓ moulds & machinery

In the breaks between the presentation blocks, the integrated catering area in our networking and industry exhibition hall will invite attendees to inform about latest trends and innovations (but can be also visited during the presentation blocks).

In addition to the scientific, technical lectures by the Institute of Polymer Technology and the Queens University of Belfast, we have of course also included a variety of lectures of our gold and silver sponsors in the program.

As a real highlight, we see two lectures on two novel and fully automatic rotational moulding machine setups. The two stand-alone and electric machine concepts will also be presented in the industrial exhibition and demonstrate a LIVE rotomoulding production.

Further presentations by industry suppliers on new materials, more economical mould or mould concepts fit well with these fully automatic machines and make for an exciting and interesting time.

In addition to lectures by recognized industrial designers, fitting the theme of “function meets design” there will also be various short presentations by the ARMO affiliated rotational moulding associations, which will inform us about exemplary product development in the respective parts of the world. Fittingly, Paul Nugent will talk about the different development of the rotation industry worldwide. We are currently working on the preparation of the chronology and details of the individual presentations, which we will publish shortly.

In the meantime a short alphabetical list of confirmed lectures:

493K; AFR – Association Francophone du Rotomoulage; AMS Automation Manufacturing Services ; ANIPAC The Mexican Plastics Association ; ARM Association of Rotational Moulders, ARMA Association of Rotational Moulders Australasia, ARMSA Association of Rotational Moulders Southern Africa ; A. Schulman; AXEL Plastics, BPF British Plastics Federation Rotational Moulders Group, Chem Trend, HD Kunststoffe; IT-RO Italia Rotazionale; IPT Institut für Polymertechnologie in Wismar; La Plastecnica; Lysis Technologies; Maag; Matrix; MAUS Rotational Moulds, Modellmakerij Hengelo; Nordic ARM; OMYA; Paul Nugent; Persico Spa; Queens University of Belfast; Resinex, RotoEvolution; RPC-CPPIA, SAT Thermique; STAR Society of Asian Rotomoulders; Templogger; TOTAL; Tramaco.

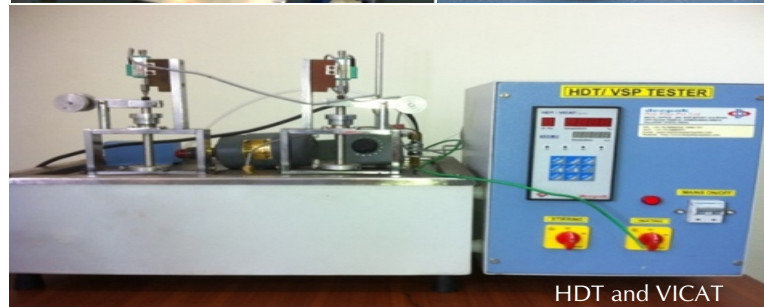
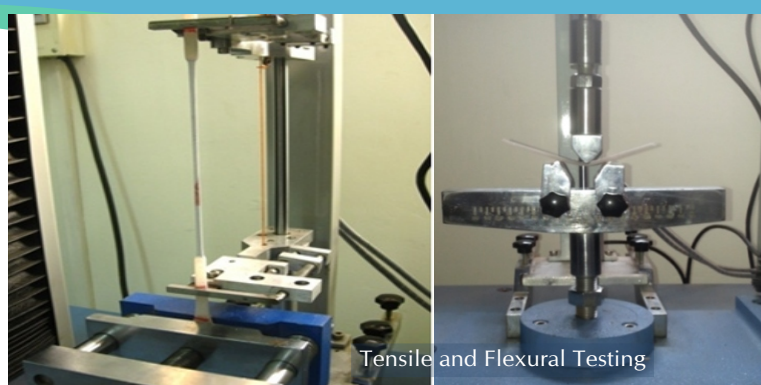


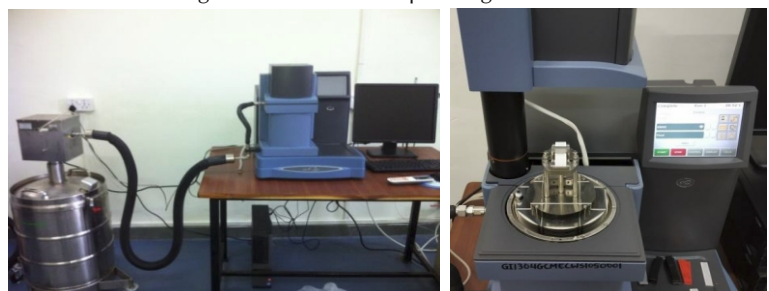
Fig. 1 Few Basic Testing Facilities

Table-1 Testing Facilities at BITS Pilani K K Birla Goa Campus

S.No.	Type of Test	Test Standard
1	Specific Gravity of Granules	ASTM D1505/D-4883/D-792 or ISO 1183, Method D
2	Melt Flow Index	ASTM D 1238
3	Bulk Density and Dry Flow Time of Powder	ASTM D1895-96 and ISO R60 redefined by ARM for use in Rotational Moulding
4	Tensile Strength and Modulus	ASTM D 638
5	Flexural Strength and Modulus	ASTM D 790
6	Specimen Making/Conditioning for tensile Test from the sheet	ASTM D 638
7	Specimen Making/Conditioning for Flexural Test from the sheet	ASTM D 790
8	ARM Low Temp Impact	ARM
9	Izod /Charpy Impact	ASTM
10	HDT	ASTM D 648
11	VICAT	ASTM D 1525
12	Oxidative Induction Time	ASTM D 3895 DTA method

Electron Microscopy (SEM) is also available for material characterization particularly the rotomouldable powder. Fig. 3 shows one such magnified view of LLDPE powder depicting the particle sizes.

Fig. 2 Accelerated Creep testing on DMTA



Finite Element Analysis (FEA) of the rotomoulded product has also gained considerable importance to simulate the behavior of the product when subjected to applied loads. Several advanced licensed FEA softwares like ANSYS, ABAQUES, etc. are available with BITS that can be used to visualize the performance of the product to arrive at required design like wall thickness, ribs design and their placement, etc. Fig. 4 shows the sample FEA results for



The Venue: Historic building of University of Hamburg

CENTRE OF ROTATIONAL MOULDING AT BITS PILANI K K BIRLA GOA CAMPUS

The growth in the infrastructural requirements over last decade has led to the growth of Rotational Moulding (RM) in India at a faster rate. Many times, the rotational moulders need to depend upon the institutes for the research, development, testing as well as training of their manpower. Though a few institutes in the country help the industries within their capacity, they have certain limitations in their functioning. There is no other known university in India who can assist the industries to move the rotational moulding technology further. Birla Institute of Technology and Science, Pilani (BITS-Pilani) is one of the most reputed Science and Technology University in India, established early 1950s, then named as BEC – Birla Engineering College at Pilani Rajasthan and subsequently becoming a deemed university in 1964. BITS Pilani K K Birla Goa campus is one of the four campuses of this university. Being associated with RM for past few years, this university campus has proposed to contribute to the knowledge in this field of RM by working together with Society of Asian Rotomoulders (StAR).

As a first step in this direction, it was understood that the successful production of typical rotational moulding product is a result of careful quality control from the raw material to the finished product. To maintain a desired level of quality in RM product, cautious testing needs to be carried out at different stages. This includes testing of resins for their suitability to RM, testing of physical and mechanical properties of products and advanced testing for material development, etc. At Goa, few testing capabilities for conducting the above tests have been developed and also remaining few will be established soon. A few basic testing facilities are shown in the photographs in Fig. 1. The details of testing facilities available for the rotational industry are shown in Table-1.

Apart from the conventional short term tests, the advanced tests like Accelerated Creep can be done in the laboratory. For this purpose, a Dynamic Mechanical Thermal Analyser (DMTA) is also available. Significant information can be generated related to the long term performance of the product using these advanced tests and BITS is already working with reputed international material suppliers in this regard. Fig. 2 shows the DMTA facility. Advanced microscopy like Scanning



MFI Testing

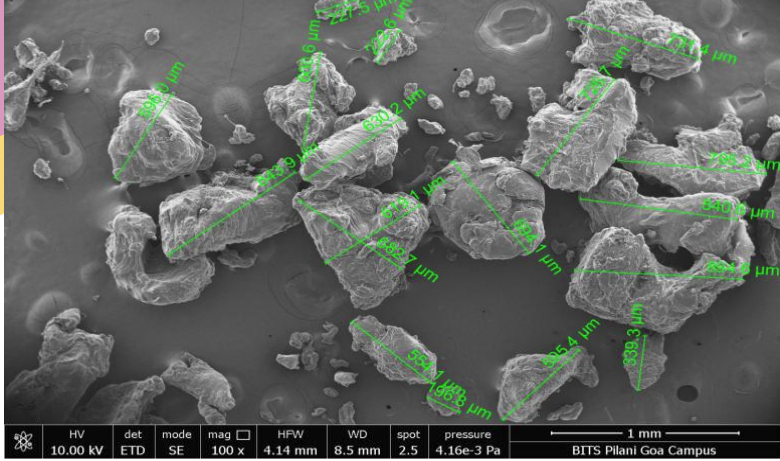


Fig. 3 SEM Image of LLDPE powder

a rotomoulded product. The well-known rotomoulding software ROTOSIM to simulate the typical rotational moulding process is also available for the use.

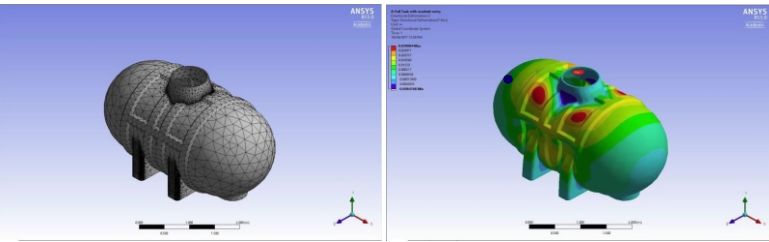


Fig. 4 FEA Analysis of Rotomoulded products

Finally, understanding the test and the interpretation of the results of the test are equally important as the testing itself. At BITS apart from merely testing the material, we believe in correlating the findings with the actual shop floor issues, similar to the clinical correlation required to understand a disease after the diagnostics tests. For this purpose, we are fortunate to have the expert guidance and support from StAR. We welcome the industry to our institute to be a part of this knowledge center. For further details, you can write at: sdw@goa.bits-pilani.ac.in

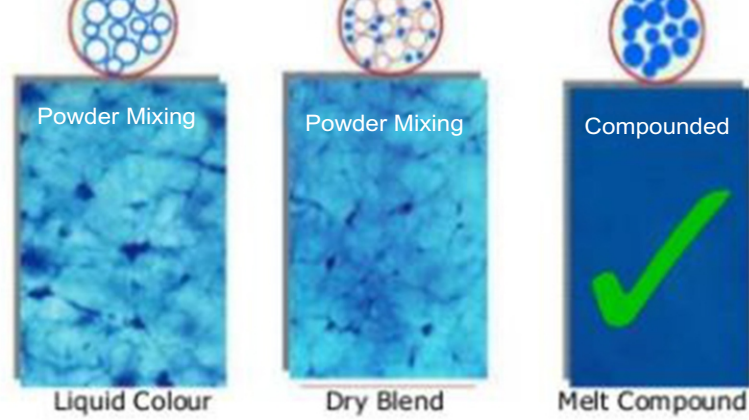
Dr. Sachin Waigaonkar
BITS Pilani K K Birla Goa Campus, Goa.
sdw@goa.bits-pilani.ac.in

UMAKANT'S TECHNICAL CORNER

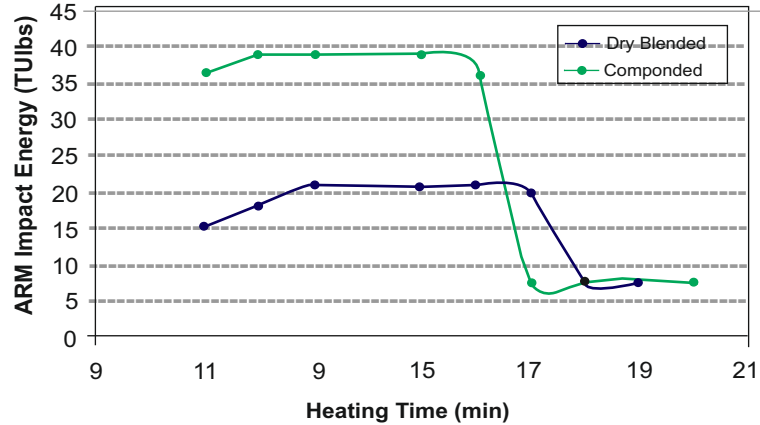
Melt compounding vs Dry blending

Making comparison of melt compounding and dry blending, we had long discussions in our previous annual conferences. In India anyway, melt compounding is a preferable approach. But lots of new molders entering into the market get interested, as dry blending avoids one processing step saving cost and time. I heard again lots of curiosity so will put some facts again on this subject Compounding Color compounds are made by heat melting the color pigment into the base polymer via an extruder creating pellets. Colored pellets are then ground where they are reduced to powder. This type of coloring gives the best possible dispersion, and uses the lowest amount of pigment. For these reasons the properties of the base polymer are retained and may even be improved. In some cases it is also possible to achieve brighter colors, and more opaque colors, since greater loading levels are achievable without loss in properties. It is also clear that as the pigment is encapsulated within the base polymer, no amount of rotation and tumbling during the rotomolding process, will remove the pigment. Hence moldings using this method are consistent, with no pigment migration to the surface.

Dry blending is done by mixing pigments with natural powder and some coupling agents in high speed mixer. Shearing action of blades brakes pigment agglomerates and distribute it evenly. High temperature makes polymer tacky and attaches pigments to polymer particles. This requires more expertise for consistency in mixing. Processing plant should have facility to handle fine mesh pigments to avoid dusting. To choose right pigment and percentage requires lot of expertise and lab facilities to match exact color. Pigment swirling and powder flow can be issues. Lot of study has been done to compare physical properties of the final molded products, melt compounded has always



Source :- QUB



Drop in impact strength in dry blending..... Source :-BASF been better. Also with dry blending, UV stabilization by using additives can be a challenging task. So for some small lots it may be economical to use direct pigments otherwise melt compounding can be a good option always.

Umakant Savadekar
Phychem Technologies
umakant@phychem.com

FORTHCOMING EVENTS

EVENTS	DATE	VENUE
IV ROTOPOL CONFERENCE	May10 – 11, 2018	Gdansk, Poland
ROTOMOULD 2018	June 3 – 5, 2018	Fiji
StAR GOA REGIONAL MEET	July 21, 2018	BITS Goa Campus
StAR NORTH EAST REGIONAL MEET	Sep 1, 2018	Guwahati
ROTOTOUR 2018	Sep 7 – 18, 2018	Italy, Germany, Netherlands
ARMO 2018 CONFERENCE	Sep 16 – 18, 2018	Hamburg,Germany
2018 ARM ANNUAL MEETING	Oct 21 – 24, 2018	Montreal, Quebec, Canada
StAR2019 ANNUAL CONFERENCE	Jan 23 – 25, 2019	Kochi, India

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