

# ROTOTALK

Quarterly Newsletter of Society of Asian Rotomoulders

## Editorial Comment

The trust between StAR and Birla Institute of Technology & Science (BITS - Pilani) Goa over the past two years had paved the way for one of the most significant development for the Indian rotational moulding industry – **Rotational Moulding Centre of Excellence for Education and Research (RMCEER)** at the BITS Goa campus. Following the signing of MOU between StAR and BITS – Pilani Goa the previous day the Inauguration event on July 21 in the presence of over sixty attendees consisting of StAR members and BITS Goa faculty & students raised hopes that a world class centre with capabilities to deliver international standard services leveraging the best of scientific research was truly in the making. Compilation of a Material Properties Publication, launch of testing services for materials & products and work commenced on Underground tank standards are important precursors of a dream coming true for Indian rotomoulding.

### Rotational Moulding Centre of Excellence for Education & Research (RMCEER) by StAR & BITS Pilani Goa-Boon for Indian Rotomoulding



StAR Founding Chair Ravi Mehra Lights inauguration lamp of RMCEER

Formation of India division of ARM USA on June 4, 2004 was the first point of success of my efforts to bring world class rotomoulding to India.

Inauguration on July 21, 2018 of Rotational Moulding Center of Excellence for Education & Research (RMCEER), a StAR – BITS initiative is now my last hurrah and a dream come true for the Indian rotational moulding industry. The location itself, BITS Pilani K K Birla campus recently recognized as a national institution of eminence standing guarantee for the highest standards of research and knowledge creation. This center which will bring tremendous benefits to the rotational moulding industry has been modeled in line with Rotational Moulding Study & Research Center (RMSRC) started at Queens University, Belfast, N. Ireland, by Prof. Roy Crawford in mid 80's.

### Dear Reader,

*The coming months promise to be a busy and interesting time for StAR members and surely the right time for companies of the Indian rotomoulding industry who are not yet members to join the membership of StAR. Increasing StAR activities bring more membership benefits invariably accompanied by plentiful savings with participation in these activities.*

*While the recently inaugurated RMCEER at BITS Goa will continue to consolidate offering growing services and attractions to StAR members and industry experiences to BITS, it is happening time in several other areas as well. StAR is planning to venture into the North Eastern part of the country for the first time to hold a Regional Meet in the beginning of September. A StAR Group will head to Hamburg, Germany to attend one of the biggest ever ARMO conferences from 16<sup>th</sup> to 18<sup>th</sup> September 2018.*



Welcome address - Prof. G. Raghurama, Director, BITS Pilani Goa

Two years ago I discussed and started working on this idea with Ashish Baheti, Past President – StAR & MD – Vectus Industries, Swetang Dave, Secretary – StAR & CEO – Consta Cool, U. Savadekar, Vice President – StAR & MD – Phychem Tech. and Dr. Sachin Waigaonkar, Associate Prof. BITS Pilani Goa. I received early understanding and support from Prof. G. Raghurama, Director, BITS Pilani Goa. Prof Waigaonkar, who has been consistently participating in StAR Conferences since 2007, has developed a very nice rotomoulding lab and program at BITS Goa, he has been working on various projects for StAR e.g lab testing services for materials and products, Materials Properties Publication and underground tank standards for design & installation and thereafter possible listing by BIS of these standards.

Glad that StAR has also signed MoU with BITS Goa for future cooperation under RMCEER initiative. RMCEER will not only work for the completion of existing projects but on following key objectives:

- Testing Services for materials & products
- Trouble Shooting & Solutions Development
- Industry Standards for Products & Processes
- Materials Evaluation & Compounds Development
- Design Analysis & Application Development
- Industrial Training & Education

Going forward “What is rotomoulding” presentation seminar need to be conducted including “Show n tell” and networking interactions with students and academia at BITS, to generate understanding, interest and excitement amongst.

Following need to be focused on in the near future:

- Tool up and mold one selected size of the designed, FEA analysed underground tank in multiple materials. Go through the total testing & validation process, including installation, to validate & certify the standards established.
- Introduction, exposure & education to orientate key BITS personnel to rotomolding:



Late Prof Roy Crawford, Ravi Mehra & Dr Sachin Waigaonkar at BITS Pilani KK Birla campus

- Visits to companies - moulders & suppliers in India
- Visits to international companies, institutes & conferences
- Participation in StAR events, seminars & conferences
- Visit to & tie-up with QUB, Belfast, N. Ireland
- Setting up testing seminars & education programs at BITS
- Students summer practice work program at rotomolding companies in India.
- Industry testing services and projects, FEA services for individual companies.

To get all stakeholders involved and also get the best advisory, RMCEER has following committees:

**Industry Advisory Council:** Moulders, Resin / Machine / Mould Suppliers, Designers/ Consultants & others

**Operating Committee:** Key StAR Board Members, CEOs of rotomoulding industry & Director/Dean of BITS Pilani Goa.

**International Advisors:** Dr. Mark Kearns - Queens University, Belfast, Mr. Celal Beysal-Floteks, Turkey, Prof. Marek Szostak - Poznan University, Poland, Mr. Martin Spencer - UniqueRoto, U.K, Dr. Nick Henwood - Rotomotive, U.K.

My hearty congratulations to rotomoulding industry and best wishes to RMCEER.

**RAVI MEHRA**  
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## RMCEER Inauguration Event -Excitement in the Air



A Baheti Past President StAR and Prof Raghurama with others from StAR & BITS Pilani Goa after signing MOU

MoU signing attended by StAR office bearers and BITS Pilani Goa Director & Deans among others had built an air of expectation on

July 20 2018. The real excitement among StAR members and faculty and students of BITS Pilani Goa was for all to see as RMCEER was launched in an impressive inauguration event the next day.

Lighting of lamp and invocation heralded an auspicious beginning and set the tone for the Welcome address by Prof. G Raghurama, Director BITS Pilani Goa. The Keynote address, by Ravi Mehra, Founding Chairman – StAR, then spelt out the vision, goals and key activities of the Center. A Show & Tell Video by Dr Mark Kearns about RMSRC – QUB visualized a future of RMCEER.

To give more insight into the development and objectives of the centre, presentations were made on behalf of StAR and BITS by:

**Mr. Ashish Baheti** - RMCEER Vision & Mission

**Prof. Sunil Bhand** - Industry Academia Interaction - Innovations and Opportunities

**Dr. Sachin Waigaonkar** - Update on StAR Project at BITS

**Mr. Umakant Savadekar** - BITS + StAR cooperation - My Perspective

**Mr. Swetang Dave** - Rotomoulding - Journey & the way forward



Lab Tour

Video clips of messages of encouragement, support and involvement as International Advisors were played out. These came from Martin Spencer of UniqueRoto UK, Dr Nick Henwood, Rotomotive UK and Prof Marek Szostak of Poznan University, Poland, all very reassuring that the centre will be adequately served by global ideas and inputs.



Section of the audience at Inauguration

More than 60 attendees from StAR and BITS Goa were made aware of the major turning points in the growth and development of rotomoulding in

India, the role of

catalyst for change played by StAR and the institutionalization of research, knowledge, training and collaboration with industry by the setting-up of this Centre of Excellence.

RMCEER will also get engaged in project work, including: Sponsored projects from Industry, academia, defense, Govt. and even from individual companies. RMCEER as independent society will be filing for being for exemptions under 12A & 80G which enables any funding contributions to be tax favoured including CSR funds.

Complementing the proceedings at the event and providing some insight into the scope for technical capabilities of the centre was a very interesting tour

of BITS labs which also demonstrated the current testing facilities available at BITS.

Networking dinner was held at Bogmallo Beach Resort. There was all round applause when Director Raghurama of BITS announced that Dr Sachin Waigaonkar who has been playing a key role in the collaborative work on behalf of BITS Goa had been promoted from Assistant Professor to Associate Professor at BITS.

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Networking time--Dinner at Bogmallo Beach Resort

## TESTING SERVICES AT BITS PILANI GOA SCHEDULE OF RATES 25% DISCOUNT OFFER FOR StAR MEMBERS



S.No.	Type of Test	Standard	Test Charges /Test INR	Recommend Min. number of Tests
1	Specific Gravity of Granules	ASTM D792	1200	5
2	Melt Flow Index(MFI)	ASTM D1238	1700	5
3	Bulk Density and Dry Flow Time of Powder	ASTM D1895 redefined by ARM for use in Rotational Moulding	1200	5
4	Tensile Strength and Elongation	ASTM D638	1800	5
5	Flexural Strength and Modulus	ASTM D790	1800	5
6	Specimen Making/Conditioning for Tensile test	ASTM D638	1200	5
7	Specimen Making/Conditioning for Flexural test	ASTM D790	1200	5
8	ARM Low Temp Impact at -40°C	ARM	2700	5
9	Izod /Charpy Impact	ASTM D256	1800	5
10	Heat Deflection Temperature (HDT)	ASTM D648	2200	5
11	VICAT Softening Point	ASTM D1525	2200	5
12	Oxidative Induction Time (OIT)	ASTM D3895 DTA method	2700	3

Special Tests on Dynamic Mechanical Analyser (DMA) Q 800 TA instruments				
S.No.	Type of Test	Standard	Test Charges /Test	Min No. of Test Required
1	Determination of Glass Transition temperature	ASTM E1640-13 or similar	5000	3
2	Determination of Storage, Loss Modulus and Tan Delta	ASTM D4065, D4440, D5279	5000	3
3	Stress Relaxation behaviour of Material including Creep Compliance	Research Study	To be formulated based on the extent of nature of studies to be conducted	
4	Accelerated Creep Testing Using TTS with Maximum force 18 N (In Linear Viscoelastic Region) Maximum Time 8 hours/sample	Research Study		

**Other Tests Possible: Scanning Electron Microscopy (SEM), Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), Drinking water quality test and many more.**

## Breaking Out of the Polyethylene Dependency with Polypropylene

As far back as the 1980's there has been a very clear desire from rotational moulders and designers for more variety of resins. The intensity of this message has not waned; it has continued and the industry just keeps hoping and asking for more. Continued requests for new resins suggest that there are

opportunities that are being missed. In this article we are going to focus on Polypropylene "RMPP141", a specifically developed grade just for rotomoulding.

### Why Consider Polypropylene?

- Where strength is concerned (stiffness, tensile strength, resistance to creep), it is superior to Polyethylene.
- It has good impact at ambient temperatures and reasonable impact down to 0°C.
- It has significantly higher operating temperature than Polyethylene.
- It has very good chemical resistance.
- It has excellent environmental stress crack resistance - ESCR
- It has better abrasion resistance with harder surface and gloss than Polyethylene.
- It has lower shrinkage than Polyethylene which combined with higher stiffness yields flatter parts, with minimal warpage and tighter tolerances.
- It is not difficult to mould, it just requires higher oven temperatures.
- It brings added value and is cost competitive.
- It is weldable, machinable and can be recycled.

If we as an industry desire to expand our horizons, we must move beyond the Polyethylene based identity. Polypropylene is the next best addition to a rotomoulder's product offering. Why? Primarily because it is not difficult to mould and existing moulds and equipment can be used. With a few slight modifications to operating parameters, you are able to mould Polypropylene as readily as Polyethylene.

The given table provides a material comparison of typical properties between LMDPE Polyethylenes and Polypropylene [RMPP141] – clearly showing the significant advantages that RMPP141 has over Polyethylenes.

WHEN THERE IS A NEED FOR  
Strength, Stiffness,  
Creep Resistance,  
High Temperature, Harder Surface,  
Abrasion Resistance,  
High Stress Crack Resistance,  
Chemical Resistance, and  
Steam Sterilization / Autoclavable compliant !  
Conformance with FDA  
THINK POLYPROPYLENE!

PROPERTY	Units	LMDPE	RMPP141
Density	g/cm <sup>3</sup>	0.937 to 0.941	<b>0.900 to 0.905</b>
Melt Index	g/10min	3.5 to 5.5	<b>11 to 13</b>
Tensile Strength	Mpa	16 to 20	<b>23</b>
Flexural Modulus	Mpa	650 to 850	<b>1,300</b>
HDT (@ 0.455MPa)	Degrees C	55 to 65	<b>115</b>
ESCR 2% Igepal	Hours	<<100	<b>&gt;1000</b>
Impact Strength, ARM	J/mm	20 to 30 [6.3mm@ 23°C]	<b>23</b> <b>[6.3mm@ 23°C]</b>

## Where to use Polypropylene?

### Infrastructure

Underground tanks and Manholes, benefit greatly from Polypropylene's increased strength and resistance to creep. And it is easy to install due to lightweight.

### Chemical Tanks

Polypropylene's excellent ESCR and chemical resistance too many chemicals make it ideal for a range of chemical tanks. These properties also make RMPP141 an option for use in roto lining of chemical tanks.

### Under-hood Automotive

Polypropylene's higher temperature capabilities than Polyethylene make it the material of choice for many under-hood automotive parts like air-ducts and reservoirs.

### Furniture

Hard surface, enhanced abrasion resistance, high gloss & high stiffness make Polypropylene suitable for many types of furniture.

### Health Industry

Polypropylene's high heat performance allow it to be Autoclaved (pressure steam sterilization ) hence is suitable for many pharma & health care applications.

### Others:

e.g. hot water tanks, hydraulic oil tanks, large tanks, large floats etc.

## Evolution

The recent introduction of "RMPP141" rotomouldable Polypropylene by PSD Rotoworx, Australia, is a unique new entrant. Most existing grades of Polypropylene have to trade-off between stiffness and toughness. RMPP141 offers a very attractive balance between both stiffness and impact, while still maintaining or enhancing other performance. Another major achievement with this new Polypropylene "RMPP141" is that it can be pulverized at ambient conditions, eliminating the necessity for expensive cryogenic grinding, and thereby reducing costs. Further this means the moulder can process any scrap generated.

The good news is that learning how to design, process, and promote Polypropylene is not a difficult step for rotomoulders. The product is available and technical specifications and processing guides will make the change easy.

*Compiled by PSD Rotoworx P/L in conjunction with Baroda Polyform*

*Distributors in India – Baroda Polyform*

*For more information contact sales@psdrotoworx.com, or www.psdrotoworx.com*

## ARMO International Conference - 16~18 September, 2018 in Hamburg, Germany

ARMO International Conference on theme "Function meets design" will not only provide great opportunity to the participants to learn from best speakers of the world but also help them build new relations

- 40 Presentations to the following main fields: (1) Case Studies to product design (2) Material and appearance (3) Process- and quality improvements (4) Moulds & machinery
- 374 delegates already registered from all over the world. More than 600 attendees expected.
- 48 Global Exhibitors signed up so far. 1000m2 of Exhibition Space.

Very encouraging interest has been received from StAR membership. Following is the present status:

- (1) 19 attendees registered.
- (2) Two Bronze Sponsors.
- (3) Two Presentations
- (4) Two Exhibitors
- (5) StAR Group Dinner has been planned on 18th September.

Apart from the Trade Show, the exhibition will have Design Show In line with the theme "functions meets design" and there will be an exhibition area dedicated to rotomoulded products that qualify for this topic.

Networking opportunities will include: Welcome Reception, Coffee Breaks, Luncheon & the Gala Dinner - Where attendees will enjoy a

through exhibition and networking dinner. Highlights of conference include:

scenic boat ride to the historic custom office of Hamburg to enjoy a night of great food, drinks and entertainment.  
More information >> [www.armo2018.com](http://www.armo2018.com)



## FORTHCOMING EVENTS

EVENTS	DATE	VENUE
StAR North East Regional Meet	Sep 01, 2018	Guwahati
ROTOTOUR 2018	Sep 07 – 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
StAR 2019 Annual Conference	Jan 23 – 25, 2019	Kochi, India

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**ROTOWORX**

# Same old horse!

## It's time to get off and try polypropylene



The combination of good stiffness and impact make RMPP141 polypropylene the ideal choice when toughness is needed, particularly at higher temperatures.



It has excellent scratch resistance, is tougher and offers greater versatility than polyethylene, it will also process easily on standard equipment.



A cost-effective solution designed specifically for rotational moulding is now available to you.

### **PSD ROTOWORX**

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### **Distributors in India – Baroda Polyform**

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