

Efficiencies, efficacy of material, and resulting environs that are congenial to fast paced modern life make us look critically at rotoplastic as never before. Flexibility and resilience of process, technology and products are the tests that will have to be cleared again and again for rotational moulding to bond durably with the future. This issue of Rototalk introspects...



IV Annual South Asia Region Division (SARD) Conference

Jan 31, Feb 1 & 2, 2008
Radisson White Sands Resort, Goa, India



CONFERENCE THEME: REVOLUTION THROUGH ROTATION

ARM International, through its South Asia Region Division (SARD) invites you to participate in the **IV Annual Conference of SARD** in the prime international tourist destination of **Goa**.

For more details on Goa
visit www.goatourism.com

3 DAY CONFERENCE PROGRAMME WILL CONSIST OF

DAY 1: Choice of Seminars

DAY 2: Morning > Technical Presentations
Afternoon > 'Rotomart' Table top Trade Show
Evening > Beachfront Annual Gala Dinner along with exciting entertainment programme

DAY 3: Morning Technical Presentations
Followed by Workshops

- LEARN • NETWORK • DISCOVER MARKETS / TECHNOLOGIES
- GLOBAL/INTERNATIONAL ALLIANCES

For Hotel Room Booking, Click on the link provided on our website > www.rotomolding.org/SARD

For Registration Form with Early Bird Discount, Click on the link provided on our website

'Rotomart' Booth Booking Form with Early Bird Discount, Click on the link provided on our website

For Sponsorship Opportunities, Click on the link provided on our website

Dear Reader,
2 ½ years and 15 issues on, of punctually delivering an appetising package of news & views, information & knowledge from the world of rotomoulding in our region has no doubt given us immeasurable satisfaction, but also entitles us to some expectations from you. We are very keen to see feedback / views/ letters/ articles from you dear reader, so that this newsletter becomes a lively medium of interaction as well. The more there is to exchange, the more there will be to learn. While we have got some response to our 'Rototalk Feedback Survey' Questionnaire we are looking for much much more. Please send to us your feedback through the Questionnaire and we can guarantee that things will move in one direction after that, which is improvement that is possible in the quality and packaging of Rototalk. The International Conference /Exhibition "trekking" season has begun for rotopeople and if you plan well you can make it into an exciting experience of learning, networking and enjoying some wonderful places. First the LAD Conference happens. The Detroit ARM International Conference will be in the spotlight after that. Following soon after will be the CEED Conference, and then for a week beginning on Oct 24 will be the biggest of them all for the Plastiworld - the 'K'fair in Dusseldorf. The icing on the cake of course will be IV Annual ARMI SARD Conference in Jan - Feb '08 in breathtaking Goa. SARD Rep on ARMI Board Ravi Mehra's article in this issue will help you make the most of these programmes which are scheduled in different parts of the world.

Ashish Baheti
Chairman
South Asia Region Division
Operating Committee
ARM International

S.B.Zaman
Manager
South Asia Region Division
ARM International

ROTATIONAL MOULDING INDUSTRY RELATED SHOWS & CONFERENCES... FROM NOW TO THE ARMI / SARD IVTH ANNUAL CONFERENCE IN GOA !

During August & September I was in India for close to four weeks and had the pleasure of again meeting many of you. I also had the privilege to attend the regional MEET in Kolkata. The changes / growth I observe & enthusiasm I notice is very satisfying to me personally; the quality of presentations & questions have also improved a lot. This has all happened primarily in the last couple of years. But there is still a long way to go, and the hard work leading to big rewards is just in the early stages. So keep it up!

My good friend Zaman, your SAR division manager, has suggested the above topic for me to write on for this issue of Rototalk. There are a number of rotomoulding & related events & conferences scheduled between now and our own annual conference in GOA from Jan 31 to Feb 2, 2008.

- ARMI /LAD Mexico Annual Conference - Sept 19-22.
- **ARM Int'l Annual Conference in Detroit - Oct 7-10.**
- **ARMI / CEED Annual Conference in Prague - Oct 22-24**
- **K-2007 Largest Plastics Exhibition in Dusseldorf - Oct 24 to 31**
- ARMI /LAD Brazil Annual Conference - Nov 2007
- Hands On Rotational Moulding Seminar at QUB, Belfast - Nov 12-14

I myself will be attending three of the above hi-lited events before the conference in GOA; namely in Detroit, Prague and Dusseldorf. All thru my professional life I have always taken the time and made the effort to attend many of these industry events. Besides the technical content and the presentations at these conferences, there are many other very important reasons & justifications to attend these by all of us involved in the growth & success of rotational moulding industry. Some of the most important reasons I have found thru out my career are:

- learning & keeping a tab on rotomoulding industry at large; whats new & what is happening.
- Making new friends and strengthening old friendships.
- Networking sharing thoughts & ideas related to your industry.
- At international conferences people tend to be more open & friendly.
- At international conferences, people from different countries can find things of mutual business interest towards mutual growth and benefits. This can lead to forming business alliances leading to ?!!

Besides all the above, by traveling and attending these business conferences, you can get opportunities to visit other companies / their operations. And I believe there is no better learning tool than getting the opportunity to visit other rotomoulding factories. For this, one needs to be attending these conferences more regularly, increase familiarity with others and also be inviting & encouraging to both share and to visit your operations. Be more open & honest. Do not expect results from going to one conference one time. Actually try and take a more active role in the industry and the conference & the trade association activities e.g. ARM Int'l. Finally, but not the least you also need to constantly upgrade, improve, invest in and make you business, factory, company more attractive & worthwhile for others to visit.

Just some experience based practical thoughts & ideas to share with you all. And I wish you all the best in your efforts and great business success!

Your / SARD's Representative to the ARM Int'l Board.

RAVI MEHRA
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ARM INTL SARD KOLKATA MEET

- Venue** : Jogajog, Peerless Inn, Kolkata
- Date/Time** : Aug 25, 2007, 4.30 P.M (Registration)
- Attendance** : 36 Participants
- Joint Sponsors** : M Plast, Noida & Raunaq Plastics, Kolkata

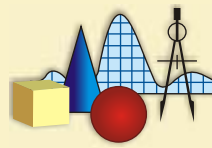
SARD Chair, Ashish Baheti welcomed participants of the 3rd Regional Meet to be held in Kolkata in as many years, but termed this one very special because of the presence of **Ravi Mehra** past President of 'ARM International', and more importantly current SARD Representative on ARM Intl Board.

With the round of self introductions over, business for the evening was quickly underway with **Deepak Himmatramka, Raunaq Plastics** presenting the **Regional Moulders Viewpoint** the customary opener in all our Meets. He termed the recent international tie-up of an Indian company to manufacture Cast Aluminium Moulds as a significant development for all regions of the Division. The biggest challenge faced by the regions' moulders who are predominantly into water tanks manufacturing is the tough competition from the unorganized sector. It is here that emphasis on good quality and good practices if followed in the organized sector can make it that much more difficult for the unorganized sector to find a place in the market.

V.B.Lall, SCJ Plastics presented next on the topic **Importance of Masterbatches**, a



Value addition by Ravi Mehra during R.P.Shukla's presentation



DESIGN CORNER

Rotational Molding Part Design- CAD File Part Details and Tooling Part 3

This issue of Design Corner will continue with Part 3 of CAD modeling techniques and details to be considered for rotationally molded parts. In my prior column I discussed the importance of deciding on the type of mold construction at the beginning of the project and its affect on part design. Now I will try to outline some of the techniques and design considerations that should be included during the CAD development of a rotationally molded part.

Although rotationally molded parts are molded hollow, it is unnecessary in most cases to shell (core out the geometry) a 3D CAD file. Almost all of the parts we design are modeled as a solid 3D part without any internal shelling. This saves us lots of time due to the difficulties that are sometimes encountered shelling a complex 3D part. Since rotationally molded part molds are based on the exterior surface of the part geometry, a shelled model is of no use to the pattern maker. A solid 3D CAD model is all that is required to construct a rotational mold. However, one has to be careful to not to ignore the basic design guidelines specific to the rotational molding process. For example the 5:1 rule for minimum separation of two parallel walls of a desired wall thickness must not be overlooked. If the internal walls of a rotationally molded part are critical in an overall assembly, the part may have to be shelled. Other factors that must be considered are inserts and kiss-offs which are sometimes difficult to visualize if a part is not shelled. As a general rule, you are not required to shell a rotationally molded part unless it is required by you as the designer to better understand an overall assembly.

Another design consideration in CAD modeling is the final part design versus the 'as molded part design'. Unlike injection molding, rotationally molded parts are typically subjected to secondary machining or cutting operations. In some cases a single molded part is cut into multiple individual parts which can be assembled to various unrelated subassemblies. This introduces complications into the CAD modeling technique since the pattern geometry will cut from a fusion of all the parts that are derived from it. The arrangement of these parts representing the pattern should be discussed with the molder and tool maker before they are assembled. CAD techniques for creating such a pattern can be accomplished by either assembling individual parts into the desired pattern or creating a master model and separating it into the individual parts. Since the designs are usually derived throughout the development process, it would probably be more likely to assemble the final parts to each other. If two parts are related to each other such as a lid and a tank, it is relatively easy to construct the part as it would be molded in one piece and then separate them in the CAD modeling into the individual pieces.

A basic understanding of the molding process and secondary operations is essential in designing a rotationally molded part since the CAD model of the part may be required to portray the part at various stages of production. For example, it is not unusual to provide a CAD model of the part at one level to the mold maker. Another CAD model of the same part may be provided to the molder to illustrate the location of molded in inserts. A third CAD model of the same part may illustrate trimming operations, where a shelled geometry is required. A fourth CAD model may be required to illustrate assembly of other plastic or metal parts to the base piece.

Hopefully this third installment of a series of articles pertaining to CAD modeling techniques has been informative. In our next issue of Rototalk, I will continue to elaborate on these, as well as other design considerations during the development of 3D CAD models for rotational molding. Until then, keep in touch and email me with any of your comments or questions at paloian@idsys.com.

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cogent presentation that covered the definition of masterbatches, types of masterbatches, manufacturing of masterbatches, importance of feedback, and trouble shooting. Explaining colour masterbatches it was said that these are loaded with organic and inorganic pigments when added in small percentages to the polymers. They impart colour to the processed products. In the context of additive masterbatches it was stated that with the growth in packaging and automotive components the demand for specific properties has gained tremendous importance. A small event to signify a landmark development for SARD was centrestage next. **The Ad-hoc Committee for Tanks standards** spearheaded by **SARD Chairman A.Baheti** undertook the first major project work which was to bring out updated Tanks Standards that matched international norms and practices in some of the most advanced countries. **Ravi Mehra** the driving force behind the SARD success story fittingly released the ARMI- SARD Tanks Standards.

The presentations resumed with **R.P.Shukla, MPlast** on the topic **What's New in Venting**. Samples of the Supavent which his company is marketing were passed around in the audience for a better understanding of the subject. The presentation set out to answer the most common questions that come to mind when the topic is venting : why Pressure ? where is the pressure ? why do we vent ? how do we benefit from pressurisation ?

In a perfectly sealed mould there is nowhere to expand and so the pressure increases and follows the temperature of the gas. In an imperfectly sealed mould warming air escapes from the flanges until it becomes blocked with plastic and cause bubbles in the parting line. Pressure will build up which will reduce during cooling. In a properly vented mould the gas inside the mould is free to come and go as required.



Bhaisali Kanjilal's Presentation in progress



Speaker S.Dave

Baishali Kanjilal, Haldia Petrochemicals made the next presentation on **Polyolefin Resin Design for Rotomoulding**. The most important requisites for such resin is a balance of Stiffness, Impact and Toughness along with high ESCR. In what was revealed as a literature research project study still in progress, critical quality parameters can be achieved by using innovative combination of traditional polymer matrices and property enhancing components.

To obtain a quantum enhancement in properties it advocated : cross linking, higher alpha olefin comonomers, advanced catalyst systems , and nucleation.

Speaking next on the topic **"Useful tips for successful rotomoulding"**, **Swetang Dave Promens – Saeplast India**, sharing his experiences pointed out that for him listening to various presentations in the ARMI – SARD Conferences and Meets has been a great learning experience. You apply and you experiment from the new knowledge gained and that is what makes you process better.

Ravi Mehra, Norstar International was on next for a **special presentation to analyse and address the issues that had been raised in the course of the evening by the presenters, including Questions & Answers**. Glimpses of this had been seen as the various presentations were being made as he provided an interactive dimension to them while each one them was being concluded. When it came to the 'Life of a mould' it depended on how it is handled, used and taken care of. One thing that should not be unnecessarily brought down is the price of your product. He strongly urged industry members "don't short change yourself by unnecessary price cutting at the cost of product quality and proficiency". When there is quality it shows on every front - he gave the example of the Saeplast plant he had visited which stood out for its high standard of upkeep.

With underground applications coming up fast, the advantages of PP are becoming more apparent because of strength.

To all those who attend conferences, he revealed that listening to and learning from presentations is only half the story. The more important half is the talking and exchange of ideas you do with other participants before and after the sessions.

The concluding **ARMI-SARD presentation** by **S.B.Zaman, SARD Manager** exhorted member companies to provide their valuable feedback through the Questionnaires sent out on **'Rototalk'** and **'Membership Benefits'**. When it comes to planning for Rotoplas in 2008 in Chicago, or the much more closer IV Annual SARD Conference in Goa in Jan-Feb- 2008 acting early brings all the advantages for successful participation.

He specially thanked Joint Sponsors **MPlast & Raunaq Plastics** for all their help and support. Cocktails & Dinner followed.

A promise made at the Kochi Meet earlier in the year was kept. CDs of the products

gallery compiled by RIL from their collection of samples acquired from the advanced roto markets of North America were handed over to all attendees who returned duly filled Feedback sheets.

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EMERGING LANDSCAPE OF ROTOTMOULDING

Before we take a look at the emerging landscape of Rotomoulding from the industry viewpoint and the point of view of a modern technological process, we need to look at the process salience of rotomoulding itself. These are :

- A low pressure , high temperature, stress-free hollow product manufacturing process
- The process offers unique niche in plastic processing to manufacture large size complex parts
- Low tooling cost, economical short runs and ability to cope with large moulds
- Ideally suited for product developments and small volume products

Rotomoulding Market Overview

The Global market size is 1290 KTA with around 1700 organised processors worldwide. Rotomoulders outside Asia are far more dedicated to non water tank applications. Asia is dominated by small moulders

Consumption Trend & Percent Growth in India

The Current size of the Indian market is 68KTA and the market is growing at the rate of 20%. It needs to be mentioned that a sizeable chunk of the raw material used in the water tank segment is reprocessed. There are over 235 organised Indian processors. Consumption in the tank sector is 90%, while 96% of the rotomoulders are in the tank sector.

Advantage of the Process

Before we list out the advantages it is important to emphasize that moulding complicated shapes is today's challenge. The advantages are :

- Unlimited product design freedom with no weldline
- Several layers of product with uniform wall thickness can be produced
- Stress free product with complex shape in multicavity mould
- Complicated designs with precision can be moulded
- Possible to fix inserts during the moulding process

Disadvantages of the Process

It has to be kept in mind that the competitive process is Blowmoulding. The disadvantages of the rotomoulding process are:

- Cycle time is relatively high when compared to other competitive conversion Processes
- Higher energy consumption
- Choice of resin is limited

Machines & Moulds

The range of machines in use now includes :

- Rock & Roll
- Clam shell/ Shuttle
- Independent arm turret
- Rocking oven
- Fixed arm turret

Moulds commonly in use are :

- MS/SS fabricated mould
- Cast aluminium mould
- High temperature resistant epoxy coated mould
- CNC machined mould
- Electroform nickel coated mould

The highly encouraging development for moulders in India is that this country has now acquired the art of good mould making.

Resins

The development of processing technology and resin-use present an interesting picture :

1920s	PVC	Early 1990s	Engg. Plastics
1950s	LDPE	Late 1990s	Foamed
1970s	LMDPE	2000s	Speciality
1980s	XLPE		

However it needs to be stated that LMDPE has the largest market share. 85% of the global consumption is polyethylene. The corresponding consumption figures for the other resins are : 13% of PVC and 5% of others like PP etc. The majority of the applications require MDPE.

Grade selection has emerged as a key decision and it is a well known fact that the more complicated a design, the more difficult it is to select a grade .Grade selection will basically depend on : Product, Product design ,Product facilities,Use of Product and Product life.

Certain niche sectors are now being taken over by PP and the reasons for this are : Continuous Service temperature is higher than in PE, Rigidity is more than in PE,

Hydraulic oil Compatibility exists, and 10-20 MFI grades that are used are adequately stabilized.

Additives

The current Additives package relevant to the process, depending on the product are : Foaming agents, Fungicides, UV stabilizers, Antioxidant & Mould releasing agent.

Rotomoulding Growth Prospects

In India, the changing face of the Indian economy in which the services sector is emerging as a key growth area, provides the rationale for high growth for rotomoulding. Packaging, Infrastructure, Agriculture, Consumer goods, Health care, and Resource Conservation are all high growth sectors that will be providing a great boost to rotomoulding. By 2010, Packing at 6.2 MMT and Infrastructure at 2.5 MMT will be major 'growth drivers'!

While the conditions of growth are well mapped out, the pillars of technological development are favourable for the rotomoulding process: Information, Ideation and Innovation. Innovation in design will be a key to success and growth. It is unmistakably a new era for rotomoulding for the dictum that works now is "If you can imagine it, you can achieve it"

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PREFERRED POWDER PROPERTIES

Last time I had dwelt upon having good flowability, and high bulk density of the P.E. powder, and appreciated the Standards being formed by ARM. I would like to add a little more to this. I will enumerate the experiences, observations and reactions of rotomoulders when they are told that the powder they are using is not of the correct physical properties.

The immediate reaction is: **"It cannot be, as we are using only the prime grade material, the master batch we are using is also branded and reputed, our extruders and pulverizers too are of standard and proven makes"**. I never expected the moulders to be so possessive.

To prove my point I put the powder under a big magnifying glass and showed them the fluffy powder they were making. To this they opened their compounding and pulverizing section to me, and showed me that only the prime material and branded master-batches are being used, the machines were also well maintained and the pulverizing blades were also sharp.

I was taken aback, well there seems to be no obvious reason for the moulder to get the fluffy powder, but the fluffy powder was a fact. I got the bulk density measured it was almost or below 0.30 gm/ml, this is a poor bulk density for the powder, it should be above 0.38 gm/ml.

On seeing this I thought of making the detailed study and do something through which the bulk density increases. On my detailed study, I came across many facts, which I would like to enumerate.

- Normally moulders neglect the pulverizers, according to them it does not contribute to the quality or cost in a big way.
- The pulverizers are having various systems. Some are complicated by the manufacturers to show that they are state of the art machines.
- Nobody I found understood the functioning of the pulverizer, and setting of the pulverizers consisted only of: the speed of feed and the distance between the pulverizing disc.

There are no standards on which the pulverizers are made; each is having a unique feature for cooling. I will enumerate the various cooling systems I have either seen or heard of:

1. Suction blower fitted immediately after the mill, the cyclonic separator is on the forced air side.
2. Suction blower is placed at the end of the system after the cyclonic separator; these blowers are normally followed with dust collection system, which are never working, or clogged.
3. I even saw a system in a Chinese machine which did not have an air lock valve in the cyclonic separator, the outlet of the cyclone was stuffed into a closed sieve separator. Frankly I did not understand this system.
4. Some give cooling water in jackets, to cool the blades as an additional cooling. And few recommended the use of chilled water to cool in these jackets.
5. A few had covered the bearing housing in this system to cool the bearings, and increase the life of bearings.
6. There was a system in which the water mist is sprayed in-between the grinding discs. This will lead to evaporative cooling, one of the best methods of cooling known.
7. I heard from some one that their mill is also provided to cool the shaft, for this rotary coupling was provided for carrying the cooling water inside the shaft.
8. Some machine builders think that the suction blowers are meant for conveying the ground material from the mill. So they provide a very small blower.
9. Many pulverizers are having air holes in their body to cool the machine.
10. Some have holes to give additional air after the mill in the conveying pipe to cool.

11. Blowers too are of various designs. Some have high volume and low discharge, while some have low pressure and high discharge; some are having radial vanes for conveying the material etc.

12. Due to poor design of the cyclone, some moulders tie a gunny bag in the cyclone's air outlet, to avoid the fine powder to the air. This is the incorrect thing to be done. Well with all the above systems, and in many cases in a single molding unit, there are different systems running side by side. It indeed is a confusing thing to understand or set the processing parameters. I will appreciate if anybody can give a feedback about their experience with different systems.

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ROTATIONAL MOULDING AND ROAD SAFETY

The package of Road Safety Products now relevant to rotational moulding are:

- Traffic lights - Cones • Bollards
- Road dividers - Drums • Signs
- Barriers • Toll junctions • Street furniture

Looking at Traffic lights first, the housing box for the traffic lights should ideally be rotomoulded. Modular design enables different height variations for the assembly while the base and the pole can be made from single piece rotomoulded plastic.

In the case of Road dividers the materials hitherto used have been Concrete, Brick, Metal, Wood, Wires and Ropes. These materials were the cause for inefficiencies & disadvantages when compared to the efficiencies of rotoplastic. The pictures tell the difference.



Concrete Barriers



Rotoplastic Barriers

The picture of products in rotoplastic now is one of sleekness in comparison to the cumbersome look that the other materials had. When the concrete of bull noses and bollards at Toll junctions gets replaced by rotoplastic it becomes a million times safer for the vehicle and driver as well as the installed components of the 'TJ'. Impact absorption is extremely efficient when there is a crash, in the case of rotoplastic. Multiple barrier systems filled with water provide an excellent cushioning effect. The lid will come off and water will spill but driver and vehicle will be saved a lot of damage that concrete would do to them.

Traffic cones are necessary markers on the road but they have to be made of material which keeps them free of any kind of rigidity, and consequently passing traffic free from any kind of damage in case of impact with such cones. Advances in new grades of polymer makes a rotomoulded cone totally flexible and tear resistant. Equally importantly the traffic cones in rotoplastic impart good looks to the roads because of their design and colour

Similar efficiencies as in the above cases, besides extremely attractive designs become the feature when rotoplastic replaces traditionally used material, for road signs and street furniture.

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NEW MEMBERS

SARD welcomes applications of following joining members.

Company	Category	Primary Contact
BITS Pilani, Goa	Educational Institute	S. Waigaonkar

UPCOMING EVENTS

DATE	VENUE	EVENT
Jan 31, Feb 1 & 2'08	Radisson White Sands Resort, Goa	IV Annual ARM Int'l SARD Conference

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