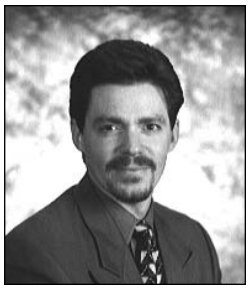
ROTATIONAL MOLDING NEWS

VOLUME 01/03
Stuart J. Lipteuer, Editor
Robert S\D. Swain, Asst. Editor

Message from the Chair



We are well into the fiscal year of the Rotational Molding Division staff has had several successful events take place. The first event was the joint RETEC, Hollow Plastic Parts Technology, held in Chicago in June. The final numbers are in and the total attendance was 207 with 25 international attendees for a total of 232. There were 39 table top exhibitors and conference committee has to thank our Julie Stout and Jim Throne for the good turnout. I especially appreciated the Rotation Magazine and the Association of Rotational Molders booths and their presence.

The conference represented all hollow part processes and the Parts Display and Competition had a good turnout of rotational molding products and a rotational molded product from John Deer won the Best of Process competition. The part was a corn picker point fender. I do have to mention though the Best Part went to a suitcase with a blow molded shell. I wanted to thank Alvin Spence and Rod Gonazales for soliciting our rotomolding members for parts for the competition. Also, I would like to thank Glenn Beall for his outstanding service in helping with this RETEC and providing the reports and updates.

Overall, I saw the RETEC as a strong success. The conference did accomplish its objectives in teaching us all about the other hollow parts processes and what economics and efforts are involved to make them. There was some comments that there was not enough information on the latest and greatest technology, but that would have been near impossible to educate everyone on the basics and include all the new technology (however our next RETEC will address this for rotational molding). The RETEC did make considerable income and it was split five ways amongst all the divisions and the Chicago section. This of course did make the individual sums maybe less than normal. Yet, if we have provided our members a service and provided funds to finance future projects for our member, then we have done exactly what we have set out to do.

I also wanted to mention next years RETEC, June 9-11, 2002. I have seen the titles and authors for papers to be presented and I am very encouraged by the depth and content on rotational molding. The title of next year's RETEC is *"Advances in Materials and Processes in Rotomolding"* and is certainty going to give our members and attendees exactly what they requested. By knowing the capabilities of the other hollow parts processes (from our last RETEC) and learning what the new technology is for our industry with the next RETEC, I think we are offering strong competitive information for success.

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2001 SPE President's CUp Awarded to Michael R. Cappelletti

The Society of Plastics Engineers awarded one of its highest honors to Michael R. Cappelletti, during its Annual Technical Conference (ANTEC) in Dallas, Texas. In a surprise presentation at the Annual Dinner-Dance, 200-2001 SPE President James H. Brackeen paid tribute to Mr. Cappelletti by presenting him with the SPE President's Cup.

ARM ANNUAL FALL MEETING

Due to the tragic events of September 11, 2001, the Association of Rotational Molders' Board of Directors postponed the 26th Annual Fall Meeting and Rotoplas '01. After careful consideration, the Board has decided to reschedule the meeting for January 27-29, 2002 at the Hyatt Regency in Minneapolis. Although ARM's tradeshow, Rotoplas™ will not be held at the same time, the January meeting will feature technical exhibits. For more information, contact ARM at 630-571-0611 or info@rotomolding.org.

The Society of Plastics Engineers Joins NetContent

SPE will use NetContent's ePowerPublisher™ technology to deploy industry news on the company's myplasticsinfo.com web site. The application will offer SPE's 31,000 members access to published articles from more than 3,000 leading publications and wire services and an option to receive an email newsletter highlighting current trends in the plastics industry.

Don't forget to visit our website at:
www.rotomolding.net

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Phillip Dodge	513-530-4128
Stuart Lipsteuer	815-759-2213
Dr. Paul Nugent	610-376-2666
Einar Voldner	905-876-1477

2002 Calendar of Events

March 17-19, 2002
Association of Rotational Molders
26th Spring Meeting
Hilton Mainz, Mainz, Germany

May 5-9, 2002
ANTEC 2002 Annual Technical Conference & Exhibition
Moscone Convention Center,
San Francisco, CA
Contact SPE Conference Dept.
Phone: (203) 775-0471 or
Fax: (203) 775-8490.

June 9-11, 2002
Rotational Molding Division RETEC
Cleveland, OH. Paul Nugent or Bruce Muller for additional information.

October 6-8, 2002
Association of Rotational Molders
27th Spring Meeting
Sheraton Centre Toronto Hotel
Toronto, Ontario, Canada

ROTATIONAL MOLDING
Society Of Plastics Engineers
Division of Rotational Molding
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The next item is the website. We now have sponsors of our website *(including this newsletter)* and you can find more information on them in the website. Simply click on the Sponsor's Banner and it will lead you to all of the supporters. With a click on each sponsor, you will be lead to their website with all the information on who they are and what they do. There sponsorships had allowed us to deliver rotational molding news and content to our members quickly and internationally. Please be sure to check them out at www.rotomolding.net. You might even find they can help you meet some of your own rotational molding needs.

Lastly, but very important, we are including a survey on the Rotational Molding Division. It is imperative that we get feedback from you so we can properly serve our members. The survey and details are included in this newsletter with mailing instructions. However, we have also included the same survey on our website, www.rotomolding.net, so that you may fill out the survey with no postage fees and when you finish the survey you will get an instant feedback on the results of the survey. Just log onto www.rotomolding.net and follow the *"Survey"* icon.

I encourage all of our members fill out the survey with your comments. If you have other comments, you can send them to me at chairmen@rotomolding.net and voice your opinions and suggestions on how we can better serve your interests. If you have general questions about our industry or would like addressing a question to our staff, please send your e-mail to rmd@rotomolding.net. We will route it to our members.

Note to our members: though the majority of this edition of our newsletter was underway before September 11, I could not go by without expressing our sorrow for those who have directly suffered from the tragedy that occurred that day. Our continued support and prayers go out to all those who have who have suffered this burden. I encourage all to show true courage and continue with your lives as usual and not let the enemy succeed. I was very encouraged by strength that I have seen and the international support. We all know the world has changed dramatically, but I know we can become stronger because of it.

Jon Ratzlaff

Jon Ratzlaff
Chairman, RMD

Meet your Officers

Tom Innis
Director of Sales, Norstar Aluminum Molds, Inc.

As Director of Sales for Norstar Aluminum Molds, Inc., Tom oversees Norstar's worldwide promotion of aluminum rotational molds and related products and services for the rotational molding industry. Tom directs a staff of Technical Sales Engineers, Project Coordinators, and Customer Service Specialists located at Norstar's Cedarburg, Wisconsin and Middlefield, Ohio plants. Tom is a member of the Association of Rotational Molders Membership Development committee, and has facilitated numerous technical presentations and workshops at industry conferences and expositions. He has held the Director of Sales position since joining Norstar *(previously Kelch Aluminum Molds)* in 1996.

Tom is a 1986 graduate of the University of Wisconsin, and holds a bachelor's degree in Spanish and International Relations. He resides in Milwaukee with his wife, Marcy, and their daughter, Katherine.

STUART J. LIPSTEUER

Stu is a graduate of Denison University in Ohio and the plastics processing course at the General Motors Institute in Flint, Michigan. He was an officer in the U.S. Navy. He and his wife, Beth, have three married children: a daughter, Betsy, who lives in Barrington, Illinois; and two sons, Bill and Brad, who reside in Denver and Richmond, VA., respectively.

Robert D. Swain

Born in Cape May, NJ. B.S. in Chemical Engineering from Lafayette College '51. Army Chemical Center…Scientific & Professional Personnel Program in Edgewood, Maryland '52-'54. Technical Sales Representative Union Carbide Plastics '51-'57, Ohio Sealer & Chemical '57-'59, Exxon Plastics '59-'67. Founded Chroma in 1967. Member of S.P.E. since 1964. Member of Color & Appearance Division, Technical Program Committee and Board Member. Member of S.P.I. and member of Board of Directors.

COUNCILOR'S SUMMARY REPORT
By Bruce Muller

Dallas ANTEC 2001

Attendance at ANTEC was 3,051, comprising of advance registrations of 2,329 and on-Site registrations *(including participants in the seminar program and spouse programs)* of 722. A total of 157 registrants also attended 20 of the Society's seminars. Incoming President Terrence J. Browitt stated the theme of his administrative year would be *"Value"*. He talked about the value in networking, and the exchange of knowledge relative to one discipline available through local section meetings. The value of face to face meetings for social dialog and professional exchange will carry on.

From the Council floor

- The Council approved the charter for the Australia/New Zealand Section.
- The Council approved the formation of a student chapter at the New Jersey Institute of Technology at Newark, NJ
- The Council approved a name change of the UK Section to the United Kingdom and Ireland Section.
- Outgoing President James H. Brackeen thanked his Executive Committee for their hard work, he made a special presentation to Mr. Loudin in recognition of his long and faithful service to SPE.
  Mr. Loudin has completed his term of office on the Executive Committee.
- Executive Director Michael Cappelletti introduced newly hired Deputy Executive Director Susan E. Oderwald.
  At the Annual Business luncheon he presented the second of a four part video series narrated by Morley Safer.
  These videos will appear on Public Television Stations across America teaching the public the positives of plastics.

Presentations.

Western Michigan:	$100 to the Essay Contest
Mr. Richard Bradley, Palisades Section Councilor:	$100 to the Essay Contest
Akron	$100 to the Essay Contest
Southern California	$100 to the Essay Contest
Wichita	$100 to the Essay Contest
South Texas Section	$17,000 to Polymer Modifiers and Additives Division and $17,000 to Thermoforming Materials and Foams Divisions for their share of the Polyolefins Conference $42,800 to SPE as their share of the Polyolefins Conference
North Texas Section	$3,700 to the Student Author Travel Fund
Mid-Michigan Section	$500 to The Foundation for the Robert Cramer scholarship Fund
Detroit Section	$16,000 to The SPE Foundation: $1,000 to the Essay Contest $1,000 for the ANTEC opening reception $5,000 for the Robert Dailey Scholarship Fund $9,000 for Educational Programs
Thermoforming Division	$75,000 for the SPE Investment Fund $2,000 for the Student Reception $3,000 for Student Author Travel Fund To The SPE Foundation: $10,000 for the Plasti Van Matching Grant Program $25,000 for the Equipment Grant Program $15,000 for Scholarship Fund $40,000 for Dr. Polly Polymer $96,526 for SPE's share of the Thermoforming Conference

The next formal Council meeting is scheduled for Saturday, October 20, 2001 in Quebec,Canada.

Intelligent Process Control for Rotational Moulding
An Introduction to Partnerships in Rotational Moulding Research

*By Martin Spencer and Mark P .Kearns**

Rototek Limited, 285 Bowbridge Road, Newark, Nottinghamshire, England NG24 4EQ

**Polymer Processing Research Centre, The Queen's University of Belfast, Belfast BT9 5AH, Northern Ireland*

Cooperative Research

Due to its low start up costs, rotational moulding is dominant amongst small and medium sized enterprises (SME's). In fact in Europe 87% of rotomoulding companies are SMEs. To meet technical challenges and to remain competitive, Small and Medium-sized Enterprises need constantly to innovate. Among other things, this means developing new technologies in-house or alternatively gaining access to them. Coupled with this, many SMEs both need and want to internationalise in search of new markets and business opportunities.

The Cooperative Research Action For Technology (or CRAFT) scheme is aimed primarily at small European companies with limited or no research resources of their own. It provides financial support to groups of industrial companies which face a common industrial or technological research need. CRAFT enables these small companies to come together and to contract a third party (a research centre, university or company) to carry out research on their behalf. Whilst the Research Centre is paid in full for its work, the results of the research belong to the SMEs involved.

Aims of the Joint Research

This particular project aims to further the capability of rotational moulding by developing both the process, and a superior, intelligent, online control capability. The ultimate deliverable will be the development of new prototype machinery for the rotational moulding industry.

The machinery will incorporate (a) innovative heating/cooling, and (b), the intelligent monitoring and control of the dynamics, heating and pressure involved in the rotational moulding process.

The project will enable the production of higher value goods with more complex structures and faster cycles than is currently possible. It will allow the production of multi-chamber, multi coloured and larger products of variable thickness, and will increase the use of new materials, such as cryogenically ground and recyclable polymers. It will permit entry into new markets in which other polymer processing methods (e.g. injection moulding, blow moulding) are technically unable to break into, therefore increasing consumer choice. In existing niche markets, it will also place rotational moulding with its low unit costs at a comparative cost advantage to the alternative polymer processing techniques.

The results of the project will have direct influence upon the core SMEs involved in the project, but also through its exploitation, an impact on SMEs who are not directly involved in the project.

It is estimated that the project has the potential to reduce cycle times in rotational moulding by 50% and increase turnover by 33%.

Project Partners

The project partners include a rotational moulding machinery manufacturer, a supplier of raw materials for rotational moulding, a polymer processor using rotational moulding and then two companies designing and assembling products utilizing rotational moulded parts. All these companies therefore have a direct interest in developing the project. By developing the technology and potential of the rotational moulding process, it will lead to better quality, better designed and lower cost end products. The Research Centres have been chosen for their expertise in their own relevant fields. The Nottingham Trent University for its knowledge of control and design in manufacturing, and Queen's University Belfast for its knowledge of rotational moulding.

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New Surface-Coating for Cast Aluminum Rotational Moulds

Molds coated with Teflon simply release the product too quickly at times which can result in unacceptable warpage and distortion of the plastic parts.

A new surface coating system, the BLACK-MAUS-COAT, is available.

Focusing on the special needs of the moulder and also the harsh environment any coating for rotational moulds must endure, this brand new coating offers new possibilities to rotational moulding. BLACK-MAUS-COAT releases the plastic in a controlled way at similar rates to conventional release agents and thus remarkably avoids warpage effects.

For further information regarding the BLACK-MAUS-COAT or other services concerning cast or CNC milled rotational moulds, please contact our experts MAUS GmbH, Am Viehweg 9, D-76229 Karlsruhe, Tel. +49.(0).721.948740, Fax +49.(0).721.9487444, E-mail: info@maus-gmbh.de. UK companies please contact Tel. +44.(0)1909.550997, Fax +44.(0)1909.550998.

CALL FOR PAPERS – ANTEC 2003

Plans are already underway for the ANTEC 2003 which will be held in Nashville, TN, May 4-8 2003. Your suggestions and ideas for sessions will be welcomed! Let us know if you are interested in moderating, organizing a session or in presenting a paper. Forward your ideas to Elizabeth Takács, McMaster University (905) 525-9140 ext. 24100 (phone) (905) 521-1350 (fax) or etakacs@mcmaster.ca (email).

Check out the new banner option on our RMD website:

http:www.rotomolding.net/sponsors.htm

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The partnerships have developed the necessary expertise across Europe in order to optimize chances of success. Martin Spencer, Managing Director of ROTOTEK LTD, is the overall project initiator and subsequently project co-ordinator. A brief description of the consortium companies in the project follows:

Rototek Ltd
Rototek is a rotational moulder of OME products and has also developed its own proprietary machinery and computer control systems to enable the production of high quality innovative products. The company has experience of industrial use of the rotational moulding process along with the control of the process using software written in-house. It is this experience, in machinery design, development and control, which the company brings to the project.

Queen's University Belfast
The Polymer Processing Research Centre (PPRC) carries out leading edge, industrially exploitable, fundamental and applied research, which demonstrably improves the competitiveness of the plastics industry. Comprehensive testing and analysis facilities (including rotomoulding machines and a grinding machine) form an integral part of the Centre in order to service industrial requirements and support research projects. In terms of rotational moulding applied research the Centre is of international repute and works closely with the Association of Rotational Moulders.

System Devices Ltd
System Devices specializes in the manufacture and supply of software and hardware systems for the control of industrial machinery. It is this expertise in control systems and appropriate software/hardware, which System Devices brings to the project.

Sorcerer Machinery
The company is a manufacturer of rotational moulding machinery. It is this experience in the production of relevant machinery and in its knowledge and experience of many types of rotational moulding machinery, which Sorcerer brings to the project, particularly in the development of pre-production prototypes.

MI Design Sarl
The company designs, assembles, wholesales and retails marine sports equipment. It has particular expertise in the design of products for rotational moulding such as kayaks and small boats. It purchases components from around Europe and assembles them in to finished products. It is in this area, particularly in the testing of the products resulting from the developed rotomoulding processes, where it contributes to the project.

Beko GmbH
The company is a manufacturer of air treatment equipment, which require the design, and purchase of complex rotationally moulded parts. The company has its own engineers and designers for such complex multi chamber products and aims to benefit from the project by being able to manufacture even more complex mouldings of a higher quality standard.

ICO Polymers
ICO is a large international company with European headquarters based in The Netherlands. The company supplies raw materials to the rotational moulding industry. ICO has extensive expertise in the chemistry, colour chemistry and grinding into powder of the raw materials for rotational moulding. It aims to benefit from the project by the introduction of new, specialist raw materials, which will be capable of being processed by the new rotomoulding technology.

The Nottingham Trent University
A UK university with an established reputation of teaching and research and with its focus work very much directed towards application with SMEs. The Department of Mechanical and Manufacturing Engineering where the research takes place has an international reputation in control and design, particularly using fuzzy logic and ultrasound technologies.

The project research began in April 1999 and has been funded for 2 years. For further details on CRAFT and other collaborative research opportunities please contact Mark Kearns or Martin Spencer at the addresses above.

WEBSITE WORKS

I just wanted to pass along some encouraging words. The website has four sponsors and another soon to be published (artwork needed approval) and this news from Linda of 21 members signing up through our website is even more great news. It is of my opinion that we are gaining substance and presence in the industry, which will lead to more members and sponsors. Please take an extra effort over the next few months and encourage non-members to take a look at our website and join our Division. The more members we have, the more enriched our Division becomes and more freedom we have to do more for our industry. Please keep us the good work!!

Jon Ratzlaff

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SCHOLARSHIP RECOGNITION PIN

SPE's primary objective is "*to promote the scientific and engineering knowledge relating to plastics."* The RMD shares this objective, but with an emphasis on the rotational molding part of the plastics industry.

The RMD Board of Directors has now established a Student Scholarship-Grant Program to sponsor rotational molding projects and scholarships for students interested in rotational molding. This is a major undertaking for a new Division with limited financial resources. However, even the longest journey starts with the first step.

That first step in this case is the donation of 1,000 Scholarship Recognition buttons by our Assistant Newsletter Editor, Robert Swain. The brightly colored lapel pin-tie tacks duplicate the RMD logo on the cover of this newsletter. The pins will be sold at $10.00 each to start the RMD Scholarship-Grant fund. The pins will be available for sale at ANTEC 2001.

Ten dollars is only a token amount for an individual, but as a group we have the opportunity of generating $10,000 for the fund. That is not a token amount, but it is a great big first step on a journey that will benefit students, SPE, and the rotational molding industry. Thank you, Mr. Swain.

Anyone interested in contributing to the growth of this fund can contact Glenn

Following are sections of a presentation entitled *"FUTURE TRENDS IN ROTATIONAL MOLDING"* as presented at the SPE Hollow Parts Technology Conference on June 11-13, 2001 by Sandy F. Scaccia of Norstar Aluminum Molds, Inc.

Introduction

It is the objective of this paper to present a picture of future trends in the rotational molding industry.

I. INDUSTRY TRENDS

Industry Trend 1-Consolidation

In the late 1980's and early 1990's custom rotational molders were proliferating at a rate faster than any other time in the industry's history. Today that trend is reversed.

Industry Trend 2 -The shift from custom molders to OEM's

Today, there are several other OEM companies that have recognized the attributes of the rotational molding process and have also brought the process in house to manufacture their own products. Markets such as commercial playground equipment, commercial floor cleaning equipment, automotive interior parts manufacturers, aircraft manufacturers and point of purchase display companies have all joined in the trend to adopt the process of rotational molding as a means to an end in their own business.

Industry Trend 3 -The evolvement of different classes of custom rotational molders

There is a growing gap between molders who have chosen to take the time tested products, markets and processes and refine them to maintain competitiveness.

II. MARKET TRENDS

Market Trend 1 -Parts designed with rotational molding as the primary forming process

The 1970's began a period where two forces acted on the rotational molding industry which would begin a trend of parts being designed for the process.

Market Trend 2 -New markets for old products

One interesting new trend is in the new uses for old products. The statuary market, for example is not at all new however, the use of statuary, for modern point of purchase displays and corporate identifiers, is.

Market Trend 3- Consolidation of parts

Because of its ease of producing relatively complicated shapes, rotational molding is giving companies the freedom to design one piece plastic parts that take the place of several individual parts.

Market Trend 4 -Acceptance of the process by new OEM players

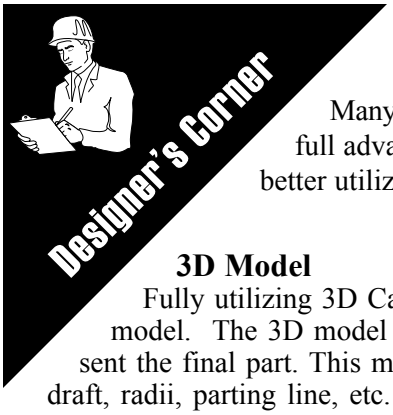
It is true that today one of the major OEM industries to use rotational molding is the children's toy market, however, other OEM's such as commercial playground manufacturers, aircraft manufacturers and automotive manufacturers have begun to embrace the process.

III. PROCESS TRENDS

Process Trend 1 -Moving into the polyolefins

Today polyethylene remains the workhorse of the industry but it mistakenly is thought of as the only material available for us in the process.

Process Trend 2 -The evolvement of machine technology



Fully Utilizing 3D CAD

Many companies have made the change from 2D Cad to 3D Cad. Some companies are taking full advantage of the features of the 3D Cad systems but others are not. Here are a few ideas for better utilizing 3D Cad.

3D Model

Fully utilizing 3D Cad starts with the 3D Cad model. The 3D model should completely represent the final part. This means it should include all draft, radii, parting line, etc. The 3D model must be made correctly and accurately to insure that pattern and tool makers can easily use the Cad file.

Assembly models should be made when two or more parts make up an assembly. Clearance and/or interferences can be determined. This can find errors and design problems.

Most 3D Cad systems have built-in tools to check for undercuts, poorly built models, etc. Learn to use all the tools available.

Drawings

Since drawing views and cross-sections are extremely easy to create in a 3D-cad system, many more are typically added to a drawing. This better shows the design details in a part. Since all drawing views are created from the 3D model, they are exact. This eliminates many errors that occur with 2D drawings, even those created with a 2D-cad system. Full size cross-sections should be added to evaluate molding issues like small radii, parallel walls, etc.

Patterns

Tooling patterns should be made directly from the 3D Cad file. Most patterns are made using the CNC process. CNC machines have been around for many years, but until 3D models were available they were not used much in the rotational molding industry. This process can create patterns much faster and more accurate than conventional methods. This can improve the overall part accuracy. For complex and highly contoured parts this may be the only option for making the pattern.

Molds

The CNC process can be used to machine an aluminum mold directly from the 3D data. CNC molds have been used for many years in the injection and blow molding industries, but are relatively new in rotational molding. Most CNC molds are more expensive than a cast mold and generally are only considered for small parts or parts with small cross-sections.

This process is being used to create molds in the automotive and aerospace industries. These industries require tight tolerances, and many molds have complex geometry. Cast molds have a tolerance of + or - .030" per foot of mold length. A machined mold can have a tolerance of + or - .010" over a 48" dimension.

There are numerous advantages of machined molds beyond tolerance and geometry issues. The grade of aluminum is tougher and denser than the cast aluminum. This means better parting lines initially and less wear as the mold is used. The dense metal will accept any texture regardless of its depth because there is no porosity in the mold. Molds can be made in 25% to 50% less time because the machining equipment is usually run twenty-four hours a day and even 7 days a week. The molds may require just as many hours of work, but it is compressed into fewer days.

Physical Properties

Physical properties such as volume and weight can be determined. When tanks and containers are being designed using a 3D-computer system, the exact volume can be easily determined. Part dimensions can then be modified to achieve the desired volume.

For all parts, the exact weight can be determined. This information allows for more accurate designs for volume and cost considerations. The part volume can be used to determine if the volume of powered plastic will fit into the mold. This information should be added to the drawing for easy reference.

FEA

Finite Element Analysis or FEA determines the stresses applied to the part due to the forces applied during its use. This shows the weak areas in the part so that it can be redesigned if necessary. Presently FEA is best used as a comparison tool. Several design modifications can be analyzed to determine the strongest design. FEA is a good tool to use for evaluating part redesign when a failure has occurred.

Renderings and Videos

3D models can be used to make full color renderings and animated videos. These renderings can also be used for sales presentations and company literature. Videos can be used for more elaborate sales presentations, either to just show a product or as part of a larger video such as a company video.

Color renderings help non-technical personnel to understand the design. Some 3D Cad systems create the rendering without addition software. With the low cost of color printers, this is an easy and inexpensive way to better evaluate designs.

Past Chairman's Report

If you have read any of my past articles you will realize that I am perhaps too sensitive to people for my own good and that I constantly clash with myself as far as short term goals, long term visions and the cost in human well being to achieve all. Glenn Beall perceived a vision of a professional division dedicated to the technology of Rotational Molding over five years ago. He brought this vision into being and then stepped back to see if the rest of us had the same vision. We did have the same vision and we continue to work toward a useful and beneficial organization. Our successes have been noticed but we have to continue our efforts to change and improve so our organization supports our members. As professionals, our responsibilities are to place today's events and technology into perspective, refocus on goals, show leadership that represents what we should be and not what we are, and forge ahead.

The RMD has had some great successes with ANTECs, RETECs, Membership, Newsletter, Web Pages, but we still struggle with lack of money for our scholarship/grant program, several recognition awards, our operational procedures, and volunteerism during poor business conditions. Our plans are bold and our newly elected board and officers are aggressive people with no sense of failure. It would be good to follow their efforts during the coming year and offer to join whenever you can. This is your organization and you have to work hard to make it the way you want it and change it when the surrounding environment dictate that it be changed.

My last official event as Chairman of the Division was the Hollow Parts Conference held in Chicago on June 10 through 13. This cooperative effort of SPE National, Chicago Section, Blowmolding Division, Thermo Forming Division, and the Rotational molding division was the brain-child of Glenn Beall. It is the only RETEC that I am aware of that has ever been presented with this type of format and large support. Glenn was the key program organizer and he was the prime RMD representative working with the other groups. I can honestly convey to you that Glenn spent numerous hours for several months working on this event. It was a great success and we all owe Glenn a special thank you for its success and its unique character.

I am now part of and in charge of the Past President's Advisory committee for the next year. This is a committee of two with Glenn Beall and myself entrusted with the responsibilities of committee. The primary goal of the PPAC is to assist the Rotational Molding Division in achieving the Division's goals. The primary objective is to draw upon the Committee member's many years of SPE, Industrial and Division experience to contemplate problems and opportunities and recommend actions that will enhance SPE and the Division's service to its members. Our selected project is to work toward establishing a scholarship/grant fund that the Board of Directors has already approved. Jim Throne has volunteered to help the committee establish several money-making ways to create this fund. Unfortunately, the economy is not cooperating with us so far but we have procedures and other section/division suggestions to work on in the interim. Our vision is to offer money and support for educational programs involving rotational molding whether scholarships to individuals, money for college/university programs, or university research. This is the basis for our existence and Glenn, Jim, and I take this program very serious. Please be prepared to open up your purses.

Sincerely
Barry Aubrey – Past Chairman

HOT LINE

Anyone having questions, complaints, or suggestions regarding the R.M.D. or who just wants to chat can contact Glenn or Barry at:

Barry Aubrey: 513-530-4216,
email:barry.aubrey@equistarchem.com

Glenn Beall: 847-549-9970,
fax at 847-549-9935.

Anisotropic measurement of short glass fiber-epoxy composites obtained by rotational molding apparatus

Authors: Kumagai, Yaomi; Urabe, Kei; Kemmochi, Kiyoshi

Source: Kobunshi Ronbunshu (2001), 58(1), 50-55 (in Japanese)

Organization: National Institute of Materials and Chemical Research, Higashi, Tsukuba, Ibaraki, 305-8565, Japan

Abstract: It has been almost impossible to make experimental composite materials with randomly oriented fillers of a heavy density in matrix resins of low viscosity, because the fillers precipitate out at the bottom of the mold due to gravitation before the liquid resins have time to cure with chemical reactions. In this paper, a new bi-axial rotational molding apparatus to cure the resins containing heavy fillers has been developed and the distribution of short glass fibers and their nickel-coated fibers has been investigated (using this instrument). An aminimide compound, adopted as a latent hardener for epoxy resins, was thermolyzed to generate a tertiary amine for catalysts and an isocyanate at 130° and above. The results obtained from SEM cross-section photographs and from fiber orientation measurements with a rotative polarization system of millimeter waves showed a random orientation of fibers. The moduli of the composites measured by flexural tests were very close to the values calculated from Nielsen's theoretical equation for random orientation in orthogonal directions.

Fine-tuning the design process for complex rotomolded structural parts

Authors: Berg, David W.

Source: Plast. Eng. (Brookfield, Conn.) (2000), 56(12), 48-52

Organization Tennant Company, Minneapolis, MS, USA

Abstract: Rotational molding allows more freedom of design than other plastics manufacturing processes. Designing the complex parts permitted by this method requires careful project management.

Rotational moulding of metallocene polyethylenes

Authors: Xin, Wang; Harkin-Jones, E. H.; Crawford, R. J.; Fatnes, A.-M.

Source: Plast., Rubber Compos. (2000), 29(7), 340-348

Organization: School of Mechanical and Manufacturing Engineering, The Queen's University of Belfast, Belfast, BT9 5AH, UK

Abstract: The authors compare the rotomoldability and mechanical properties of conventional polyethylenes with metallocene polymers (all LLDPE) having a similar melt flow rate or the same density. The rotomoldability was evaluated in terms of bubble removal, cycle times, and heat stability during the molding process. The mechanical properties, such as tensile strength and peak impact energy, were measured on parts produced using a variety of molding conditions. It was found that the metallocene polymers display greater toughness if subjected to the same molding conditions as the conventional polymers. Conversely, the same toughness can be obtained in both materials if shorter cycle times are used for the metallocenes. This behavior was linked to the relaxation behavior of the molecules in the solid state. Other material parameters, such as the nature of the comonomer, the long chain branching density, and the crystalline morphology were studied by NMR, DSC, and polarizing light microscopy. The differences between the molecular structures of the 2 types of polyethylene can be used to explain why the metallocene materials possess many rheological and other characteristics that are desirable in rotational molding.

Prediction of mechanical properties of polyethylene mouldings based on laminate theory and thermomechanical indices

Authors: Godinho, J. S.; Cunha, A.; Crawford, R. J.

Source: Plast., Rubber Compos. (2000), 29(7), 329-339

Organization: The Queen's University of Belfast, Belfast, BT9 5AH, UK

Abstract: The properties of molded plastic products are dependent on the processing technology used in their manufacturing and in particular on the structural morphology resulting from the thermomechanical environment imposed on the melt. The authors present a unified approach to describe the behavior of the products based on knowledge of the thermo-

and cooling rates). The processing conditions used were typical of those in common use in the respective industries. The molding parts were mechanically tested to determine the tensile, flexural, and impact properties. These measurements were performed both on samples corresponding to the entire thickness of the molding and on slices taken from across the section of the moldings. On the basis of these measurements, two models were developed. One is based on laminate theory, in which, from a knowledge of the mechanical properties of the individual layers through the wall thickness, it is possible to predict the tensile and flexural properties of the full thickness molding. The other is an empirical model that predicts the tensile modulus of a plastic part as a function of two thermomechanical indexes. It is shown that the type of dependence of the mechanical performance on the thermomechanical conditions imposed during processing is similar for the three molding techniques used. A good agreement is achieved between the experimental data and those predicted by the thermomechanical model. It is also shown that via the combined use of the thermomechanical indexes concept and the laminate analogue, good predictions of the mechanical behavior of plastic moldings with complex microstructures can be achieved. It is proposed that this approach could provide a very valuable addition to existing melt flow simulation packages. This would enable not only processing conditions to be optimized but the properties of the end product could be predicted.

Influence of thermomechanical conditions on structure development and mechanical properties of polyethylene mouldings produced using different moulding methods

Authors: Godinho, J. S.; Cunha, A.; Crawford, R. J.

Source: Plast., Rubber Compos. (2000), 29(7), 316-328

Organization: The Queen's University of Belfast, Belfast, BT9 5AH, UK

Abstract: The properties of molded plastic products are dependent on the processing technology used in their manufacturing and in particular on the structural morphology resulting from the thermomechanical environment imposed on the melt. The authors investigate these phenomena, through the molding of polyethylene using different methods and the subsequent testing of the mechanical properties of the products. A unified approach is presented to describe the behavior of the products based on knowledge of the thermomechanical conditions imposed during processing. A linear medium-density polyethylene was processed using rotational molding, compression molding, and injection molding in order to achieve different thermomechanical conditions (i.e. shear rates and cooling rates). The processing conditions used were typical of those in common use in the respective industries. The molded parts were mechanically tested in order to determine the tensile, flexural, and impact properties. These measurements were performed both on samples corresponding to the entire thickness of the molding and on slices taken from across the section of the moldings. The mechanical tests were complemented with density measurements, to assess the crystallinity across the wall thickness, and polarized light microscopy, to characterize the moldings' microstructure. It is shown that the type of dependence of the mechanical performance on the thermomechanical conditions imposed during processing is similar for the 3 molding techniques used.

A gram of prevention: additives for rotomolded parts

Authors: Steele, Thomas; Davis, Leonard

Source: Plast. Eng. (Brookfield, CT, U. S.) (2001), 57(5), 36-40

Organization Cytec Industries, Inc., Stamford, CT, USA

Abstract: UV stabilizers and antioxidants address the specific needs encountered by rotomolded products from the processing stage through end-use applications.

Rotationally molded polyethylene: structural characterization by X-ray and microhardness measurements

Authors: Cramez, Maria Clara; Oliveira, Maria Jovita; Fakirov, Stoyko; Crawford, Robert James; Apostolov, Anton Atanassov; Krumova, Marina

Source: Adv. Polym. Technol. (2001), 20(2), 116-124

Organization Universidade do Minho, Departamento de Engenharia de Polimeros, Guimaraes, 4800, Portugal

Abstract: Rotationally molded polyethylene (PE) blended in two ways (turbo blending and extrusion) with nucleating and nonnucleating pigments is structurally characterized by wide- and small-angle x-ray scattering (WAXS and SAXS, resp.),

DSC and microhardness measurements. Morphology observations are performed by polarized light microscopy. The melting temperature and the degree of crystallinity (from both DSC and WAXS) remain essentially constant regardless of sample preparation and type of pigment. The same holds for the crystal sizes from WAXS and the lamella thickness from SAXS. Only the values of microhardness depend on the type of pigment, increasing about 10% when a nucleating type is used. The almost constant values of these properties, contrasting to the spherulitic morphology, are explained by the fact that the processing conditions in rotational molding are very favorable for crystallization. As a consequence, optimal crystallization structure is achieved, which masks significantly the effect of pigments and blending conditions on the crystallization behavior of polyethylene.

Rotational molding of two-layered polyethylene foams

Authors: Liu, Shih-Jung; Yang, Ching-Hsiung

Source: Adv. Polym. Technol. (2001), 20(2), 108-115

Organization: Polymer Rheology and Processing Lab, Department of Mechanical Engineering, Chang Gung University,Tao-Yuan, 333, Taiwan

Abstract: Rotational molding of polyethylene foams has increasingly become an important process in industry because of its resultant thicker walls, low sound transfer, high stiffness, and good thermal insulation. This report assesses the rotomoldability of two-layer polyethylene foamed parts. The polymeric material used in this study was linear low-density polyethylene and the foaming material was an endothemic chemical blowing agent. Two different molding methods, by powder and by pellet, were used to mold the multilayer foamed parts. Rotational molding experiments were carried out in a laboratory scale uniaxial machine, capable of measuring internal mold temperature in the cycle. Characterization of molded part properties was performed after molding. Optical microscopy was also employed to det. the bubble distribution in foamed parts. The final goal of this study was to investigate how the blowing agent and processing conditions can influence the process of rotational molding and the final product quality. It was found that the rotational molding of two-layer polyethylene foams produced parts of better impact properties, as well as fine outside surfaces. In addition, rotational molding of foamed parts by pellets saves the cost of powder grinding, but is counteracted by uneven inner surfaces.

2002 Product Design Competition
by Alvin Spence

What is the SPE Product Design Competition?

The Society of Plastics Engineers' annual design competition is intended to promote the use of plastics by recognizing and rewarding design excellence in the use of plastics materials and processes. The SPE's Product Design Competition is a part of their International Awards Program. Each year, one consumer product winner and one industrial product winner is selected. Each winner receives an award of $2,500, a plaque and some plastic's industry media publicity. This year, these awards will be presented during the Awards Luncheon, at the SPE's Annual Technical Conference (ANTEC 2002), in San Francisco, California, on May 7th, 2002.

How are the Entries Judged?

Judging of the entries takes place in January of each year. The SPE suggests that the products being considered should have been offered commercially no earlier than January 1st, 2000. The plastic part is graded by its performance in the following categories:

· Integrity of the design (sound design and proper use of plastics).
· Innovation of the design (use of plastics and function of product).
· Positive impact on the environment.
· Manufacturability.
· Value to the product marketplace and plastics industry.
· Overall appearance (shape, size, color, texture, etc.).

How do I Submit an Entry?

The deadline for submitting entries is December 3rd, 2001. The application form entitled "2002 Plastics Products Design Awards" (on the following page) can be used to submit an entry. This form has been taken from the SPE web site (http://www.4spe.org/AW4.HTML).

The steps needed to submit an entry are as follows:

1. Complete the application form, providing as much detailed information as possible.
2. Fax it (Fax #: 203 775 8490) or post it to: Society of Plastics Engineers
Attention: Chair, International Awards Committee
PO Box 0403
Brookfield, CT 06804-0403
USA
3. To aid the judging process, the competition application form strongly recommends sending a sample of the product. Samples can be sent to the SPE above address after the December 3rd application deadline - but need to reach the SPE by early January 2002. For large objects, contact the SPE (Tel #: 203 740 5437) for shipping instructions. If the size of the part is prohibitive, consider cross sections and photographic illustrations.

Previous Rotationally Molded Winners!

This competition spans all plastic processes. However, rotomolding has been shown to be more than capable of winning an award e.g. a rotationally molded Tennant floor sweeper won an award in 1998. Your willingness to be part of this competition is greatly appreciated. It brings credit to our industry and raises awareness as to what rotational molding is capable of producing.

2002 Plastics Product Design Awards
Glenn L. Beall Awards ($2,500 honorarium plus plaque)

USE THE FOLLOWING GUIDELINES
· Optimum utilization of plastics (material selection, design, suitability for intended application, economy).
· Creativity and originality (a fresh approach to solving a design problem).
· Value to the end user (quality or benefits, fills a need).
· Impact on plastics industry (a new trend, a major market success, possesses significant potential for volume production).
· I/We nominate the following product for the 2002 SPE Award checked below.
Design Award: Consumer Design Award: Industrial

The deadline is December 3, 2001. Complete the form below and include all product information.

PRODUCT NAME:
DESIGNER (CREATOR):
MANUFACTURER:
STREET ADDRESS:
CITY, STATE, ZIP:
COUNTRY:
TELEPHONE #: FAX #:
E-MAIL ADDRESS:

Was manufacturer's permission obtained for this nomination? Yes No
When was it first offered commercially? (No earlier than Jan. 1, 2000)_____
BIOGRAPHICAL INFORMATION For DESIGN PRODUCT nominations: (sample preferred)
Product sample being forwarded. Product sample included.

Attach statement describing product following the guidelines above. Also, include:
1. type of plastics material
2. process employed and
3. how plastics materials make product possible

ALL NOMINATIONS MUST BE SIGNED

INDIVIDUAL SUBMITTING
NOMINATION:
ADDRESS:
CITY, STATE, ZIP:
TELEPHONE #: FAX #:
E-MAIL ADDRESS:
SIGNATURE: DATE:

Use one form for each award nomination. Photocopy this form for additional nominations. Attach all separate sheets and mail completed form(s) to:

SOCIETY OF PLASTICS ENGINEERS
PO Box 0403
Brookfield, CT 06804-0403 U.S.A.
FAX: 203-775-8490
ATTN: Chair, International Awards Committee