

magazine

SEPT 2015



ARMO

AFFILIATION OF ROTATIONAL MOULDING ORGANISATIONS

Thonet's Lounge Chair 808

Utilising Value Networks For Rotomoulding

Icorene High Performance Specialty Grades

Getting Your Machines Working The Same Way

Creating Brilliant, Permanent Graphics

How To Estimate Wall Thickness For Round Tanks



Image Courtesy of:



suc•cess [sək-'ses]

quality performance roto powders; high UV color compounds; extended flex fatigue resistance; ultra-low temperature toughness; high stiffness; combination of toughness and rigidity; high hardness and scratch resistance.



While ICO Polymers is no longer part of our name, A. Schulman Specialty Powders remains your best choice to meet virtually any processing or performance need. Backed by 30 years of experience, we continue to provide a full range of products – including all your Icorene® favorites.

A. Schulman is a leading global supplier of high-performance compounds, resins and masterbatches.

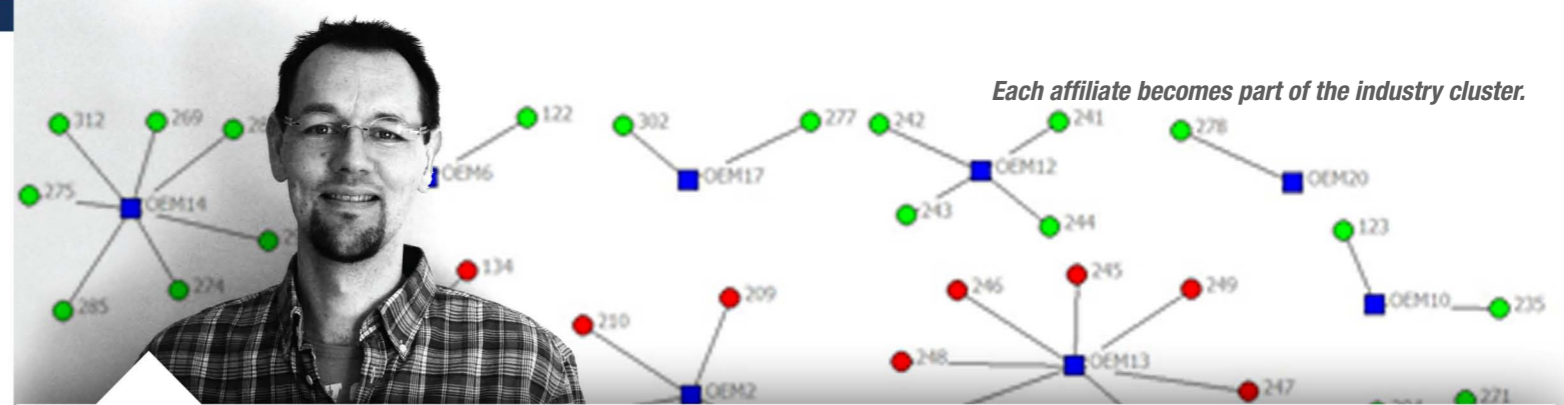
The rotomoulding division under the Specialty Powders unit collaborates with our other product families to provide resources that are used in a variety of end markets such as mobility, packaging, agriculture, building and construction, and electrical and electronics.

Our definition of success is helping you achieve yours.



Customized high-performance plastic compounds, resins and masterbatches.

www.aschulman.com



Each affiliate becomes part of the industry cluster.

ARMO CHAIR MESSAGE

UTILISING VALUE NETWORKS FOR ROTOMOULDING

When looking through some historical information about ARMO from its initial agreements in 2000 I found a document that described the original vision as a “hub & spoke” where all the affiliates are interconnected and their members form a larger network. It occurred to me that it was an early version of what has become known as a value network. A concept that is now accepted as the best way forward for global manufacturing to survive and prosper in an ever changing world economy.

A value network is like an ecosystem, and many analysts even map them out for presentation. Value networks contain symbiotic relationships in which the participants all benefit in some way from their participation in the network. Similarly, if one part of the value network is weak, the rest of the network may suffer.

They contain both tangible or obvious benefits and others that are more difficult to define or quantify. A tangible example for our industry would be where companies have chosen to share moulds or product licenses, swap staff to improve their own expertise or even buy or sell machinery across the world. The intangibles are in increased knowledge, industry intelligence, technical know-how and collaboration.

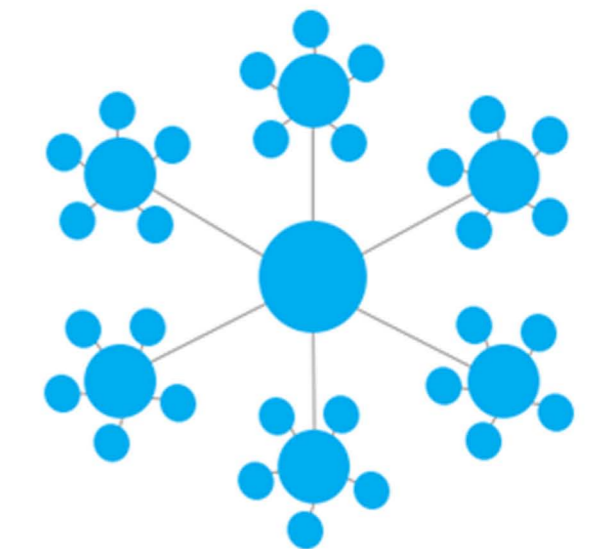
After almost 15 years, ARMO’s original concept has begun to formalise and utilize these clusters within the network and we continue to work to make sure relationships are built between all our various members. Of course, as you read this many of you will be in Nottingham at ARMO 2015. While you are here I strongly encourage you to meet your peers and to take full advantage of our own industry’s value network. The potential for your business to access those intangible benefits is never easier than at such events. For those of you who for one reason or another have been unable to attend, of course you can still access the huge potential within our global relationships by contacting your local ARMO affiliate. The ARMO event has been organised by BPF and their Rotomoulding Group, I would like to take this opportunity to thank them for all their hard work and wish you all a great conference.

■ Oliver Wandres

Thank you:



PERMANENT GRAPHICS FOR PLASTIC, BRILLIANT



ARMO’s original “hub & spoke” model for the future.

ICORENE® High Performance Specialty grades

At A .Schulman we strive to provide the rotational moulding industry with the most comprehensive and technical grade slate available in Europe.

The ability to call on our experiences from our other business units such as Engineering plastics and Masterbatch, provides the Specialty powder division with resources that cannot be matched by our competitors.

Enclosed you will find the High Performance specialty grades for rotational moulding that will enable new products and applications to be explored. This will provide OEM's with alternatives to other processes that they are currently using.



ICORENE® 4035 Polypropylene

Rotational moulding polypropylenes have always lacked an important material property, impact resistance. Icorene 4035 exceeded our expectation during its recent development, with Impact @ 23° up to 6 times higher, Impact @ 0° up to 8 times higher and Elongation at break 3 times higher than the leading PP grades available



ICORENE® 7620 Fuel lock

ICORENE® Fuel Lock™ powder represents an exciting new PA6 rotomoulding material option derived from a technical collaboration between A.Schulman and DSM Engineering Plastics. It is a unique new PA6 polymer based material for optimum performance in fuel permeation resistance and excellent physical properties especially in direct contact with fuel.



ICORENE® 9005 Nylon 12

A nylon 12 powder specifically developed for use in rotational moulding and is suitable for use in many different applications. It has good overall mould ability, high stiffness and high temperature resistance.



ICORENE® 1505 Xlink

Cross-linkable ICORENE high density polyethylene resins are unique materials that offer rotational moulders the advantage of high-flow moulding and high molecular weight part performance.



ICORENE® 1869 Rotolining

This grade has been designed using a high performance additive package formulated to provide an excellent bonding to metal surfaces during processing.



ICORENE® 1870 Rotolining

This new rotolining formulation with outstanding adhesion can be used at half the thickness of other rotolining grades. Icorene 1870 is a thermoplastic material that has been specifically developed using the formulation experience of A. Schulman in polymer technology.



ICORENE® 4014 Polypropylene

When the application requires an increased stiffness or a higher temperature resistance that PE cannot meet, then Icorene 4014 is an ideal grade choice. It is a copolymer that has been specifically developed for rotational moulding with an excellent balance in properties, yet easy to mould



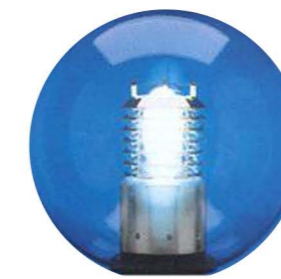
ICORENE® 9105 V0 Flame Retardant

Many applications in the building, construction, transport and mobility sector specify a high flame retardancy in the properties of the thermoplastic. Now Icorene 9105 V0 FR meets this requirement opening new opportunities to moulder's and OEM's alike.



ICORENE® 9402 TPE

ICORENE® 9402 is an olefin elastomer specifically developed for rotational moulding by A. Schulman in conjunction with API Plastics. Offering optimum cold and hot elasticity with UV resistance, it has an excellent appearance with excellent soft touch properties.



ICORENE® 9909 Polycarbonate

In the past only a few rotomoulders were able to process Polycarbonate (PC) in Europe. A. Schulman's goal with the development of ICORENE® 9909 was to generalise the ability to process and enlarge the possible applications for PC.



ICORENE® 9993 PVDF

How many projects in roto moulding have been turned down due to no availability of a suitable material? ICORENE® 9993 PVDF belongs in the fluopolymer family and is the grade when other materials can not handle the specification. An incredibly high chemical resistance and toughness not found with any other roto grade. This is the grade when all other materials fail!

While ICO Polymers is no longer part of our name, A. Schulman Specialty Powders remains your best choice to meet virtually any processing or performance need. Backed by 30 years of experience, we continue to provide a full range of products – including all your Icorene® favorites.

Your sales team is the same. Your production team is the same. And the quality is the same, wherever you need it, when you need it.



CREATING BRILLIANT, PERMANENT GRAPHICS FOR THE ROTATIONAL MOULDING INDUSTRY

PERMANENT GRAPHICS FOR PLASTIC, BRILLIANT

The saying “necessity is the mother of invention” rings true for New Zealand based company PSI Brand. Its permanent, indestructible and innovative INMOULD and POSTMOULD ‘peel and stick’ graphic solutions are literally making their mark on rotationally moulded products across the globe.

For PSI Brand CEO Steve Crawshaw, the drive to find a new way of creating visuals for plastic products was borne out of frustration in his own rotational moulding company.

“In the late 1980s the industry was becoming increasingly aware of the inadequacies of engraved plates, screen printing and other graphic processes that were giving an inferior finish to plastic products. Printing stickers is one thing, but making them last is another. We kept asking ourselves how we could develop a way to make a graphic adhere permanently to polyethylene and we thought if we could develop a system that was as simple as a ‘peel and stick’, then we’ve got something,” explains Steve.

The innovative solution came in early 2000, after a decade of extensive trials, research and development in Steve’s company, Stallion Plastics.

“It took a long time to find the right material and refine the print process,” he says. “We researched materials that were compatible with polyethylene and that would melt to the surface, rather than sit on it. Out of that we developed a pre-moulding solution in the form of a synthetic printable paper that bonds to the plastic during the manufacturing process. It can be applied to moulds at virtually any temperature, saving time by eliminating the need for pre-heating and cooling.

“We also developed a post-moulding answer in the form of a ‘peel and stick’ graphic that is supplied on a transfer backing and easily applied using heating and burnishing tools to embed them into the plastic.

Steve says developing the business was a direct response to the demand from his customers and other rotational moulding companies. “By adding graphics and surface finishes to a product it adds value, enhances, and creates what we like to call ‘brilliance’”, he says.

In 2003, Steve sold Stallion Plastics and established PSI Brand to focus solely on refining the INMOULD and POSTMOULD graphics process.

New Zealand proved the ideal location to base the business, with the “right types” of industry present including adventure tourism and agriculture. It was fertile ground that provided PSI with the opportunities to develop its range.

“We experienced high demand from canoe and kayak manufacturers who were looking for an improved, more lasting solution for logos and other branding to be featured on their products. Our graphics are well suited to these types of rotational moulded products as they are a permanent solution.”

Demand also came from the agricultural industry. Tanks, machinery and farm equipment requiring barcodes, sequential numbers, and warning or instruction labels were ideal applications for PSI’s graphics. Not limited to industrial applications, PSI Brand’s systems enable any graphic, whether functional or decorative, to be embedded permanently into a plastic article.

Most commonly used in rotational moulding environments, the graphics are also suitable for injection and blow moulding as well as thermoforming applications. It’s an industry Steve knows well.

sales@psibrand.com

www.psibrand.com

+64 6 834 7889

VISIT US AT NOTTINGHAM FOR YOUR FREE SAMPLES



This advert is intentionally upside down.



- + No residue
- + Eliminate cleanup
- + No additional glue
- + Goodbye to solvents
- + Less rejects



TURNING GRAPHICS UPSIDE DOWN

“As rotational moulders ourselves, we understand the limitations and requirements of the manufacturing process. That knowledge enables us to find a solution that’s workable with the unique nature of the product,” explains Steve.

Ten years on, PSI Brand has expanded to 22 staff and demand for its products has seen the business expand rapidly. Seventy percent of the graphics produced now are sent offshore, for customers spread across the globe including China, Saudi Arabia, USA, Canada, Poland, Germany, France and Australia.

The company’s distribution networks and technical representatives based in Australia, USA, Europe, and China provide support and contribute to the reputation PSI Brand has earned for doing business easily, with customers’ locations no barrier. Examples of PSI Brand’s graphic solutions can be found in a variety of applications worldwide.

Hussey Seating Company, based in Maine, is a world leader in spectator seating for venues including gymnasiums, sports stadiums, arenas, events centres and auditoriums. Together, Hussey and PSI Brand have developed a revolutionary graphic system for telescopic bleacher seating utilising the latest in digital print technology.



Hussey Seating

Each seat features a portion of an entire team logo, in effect using individual seat modules as tiles in a grand scale mosaic that covers the face of the bleacher. It's a ground-breaking technique, and one that the seating giant asked PSI to help them realise.

"We approached PSI Brand and asked them to collaborate on developing a solution that would allow our customers to take advantage of the large canvas presented by the front of our bleachers. We're all familiar with the concept of a 'bus wrap', and this seemed like a natural extension of that application.

"But the materials and surfaces involved are challenging, and we needed PSI's expertise to develop a solution that would overcome those challenges and stand up to a demanding school environment. They provided samples of the permanent graphics and consulted with us via video link. The ease of application, the brilliant colour opaqueness and the permanent nature of the graphics appealed and has provided a great breakthrough in gymnasium customisation," says Hussey's Director of Marketing, Chris Robinson.

In Australia, PSI Brand is working with Sealite, a global manufacturer of marine aids to navigation, providing custom graphics for use on its buoys. "Graphics account for around 20 percent of our moulding business," says Peter Rainey from Sealite. "PSI supplies the graphics in a range of colours and designs that perform well in the challenging conditions of the ocean."

It's the constant desire to innovate and create that drives the team at PSI Brand. At the company's headquarters in Hawke's Bay, the lab is busy trialing and testing batches of graphics and developing new solutions to sometimes old problems in the industry. Already PSI Brand has a range of complimentary products in the market including Surface Enhancer, Mould Release Agents and industry specific equipment.

"We have a genuine desire to help our customers find workable and cost-effective graphics solutions," says Steve. "No matter the shape or scale of the product, we'll create a permanent graphic to suit. And it will be brilliant!"

Q&A

With PSI Brand CEO Steve Crawshaw



What keeps you passionate about your work?

We love a challenge and are driven by the opportunities for innovation in our business. Advances in technology are also presenting new ways to develop products and applications.

What has been the best business decision you've made?

To sell our rotational moulding business and focus solely on the graphics solutions. Plus our decision to expand and export – we have worked hard to develop our export business and PSI Brand is now recognised as a leading supplier of pre- and post-moulded graphics in the world.

What is your core business philosophy?

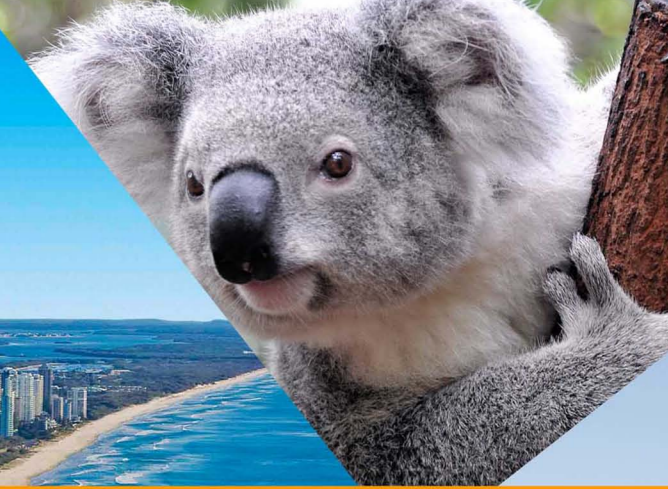
Don't settle for the status quo – be hungry, get out there and 'make it happen'. To build relationships with our customers that are on-going and provide a service that exceeds their expectation. And to always act with integrity and honesty in everything we do.

What's the best thing about working at PSI Brand?

This is essentially a family business with my four sons, but there are key players who are not family and who are integral to the success of the business. There is a great team atmosphere.



ASSOCIATION OF
ROTATIONAL MOULDERS
AUSTRALASIA INC



ROTOMOULD 2016

THE ARMO CONFERENCE



JUNE 19-21

Gold Coast, Australia

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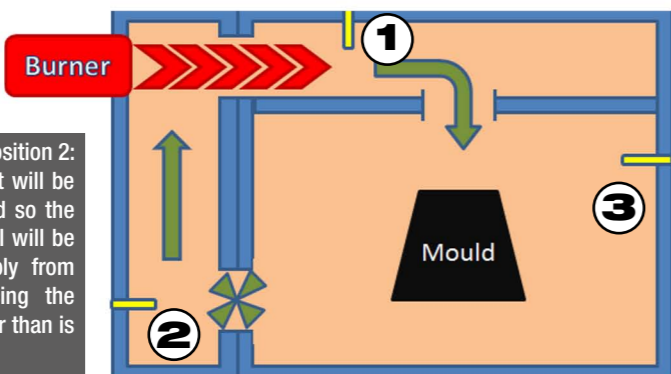


ARMO
AFFILIATION OF ROTATIONAL MOULDING ORGANISATIONS

A SIMPLE TRICK TO GET YOUR DIFFERENT MACHINES THAT ONE STEP CLOSER TO MOULDING IN THE SAME WAY.

A simple explanation of why oven temperatures vary between machines and why the air temperature around the mould and the air temperature displayed on the cabinet is sometimes different.

Control Temperature Probe Position 1:
The feedback to the control panel at this position will be fast responding, reaching the set point quickly. This will tell the burner to choke back to maintain the set-point and potentially leave the oven chamber under heated.



Control Temperature Probe Position 2:
The temperature at this point will be the coldest in the circuit and so the feedback to the control panel will be demanding more heat supply from the burner potentially forcing the oven temperature to be hotter than is measured.

Control Temperature Probe Position 3:
The temperature measured at this point will potentially be the closest to what the mould will see (provided it is not in a position of stalled air). There is less chance of the control probe being biased by the burner flame.

NOTE: It is not recommended to adjust the position of the control probe. This may have a severe impact on the control circuit of your burner.



Gareth McDowell

Gareth McDowell established 493K Limited to develop, and manufacture, data acquisition and control systems. These systems will improve quality and process efficiency, for the heating and cooling stages of rotational moulding. Advancing a body of research and development work, which started over ten years ago, he is currently marketing K-KONTROL and K-PAQ, a diagnostic mould temperature and pressure measurement system for 493K.

gareth.mcdowell@493k.com

Most moulders will have experienced that moment when they realise that a part moulds well on one machine but not so good on another. Either it comes out over cured, under cured, a little more warped, or maybe even with different wall thicknesses. There is no wizardry involved, just different machine parameters or more accurately different reporting of those parameters by the different machines. What I mean by this is that the temperature of the set point of the oven may not be a fair representation of what the oven air temperature is around the mould. So if you have your two different ovens set with an oven temperature each of 300C they may not actually be at 300C where the mould is. This, along with oven air-flow, is the single biggest cause of inharmoniousness moulding between machines. This disparity between oven temperatures comes from the position of the control thermocouple, often too close to the burner flame and thus giving a higher than actual temperature. (See Chart 1). The same uncertainty and variance will happen more so in the cooling station when the mould is being cooled. This is because there is currently no set-point for cooling rates that bares any resemblance to a standard that one can transfer from one machine to another even within your plant. The parameters involved in the cooling are the same as found in the oven: Cooling temperature and air flow PLUS the extra one of cooling medium: the medium can be air or air + water or just water. In cooling it gets even more complex!

TRICK #1

Let's start with the oven and in particular the temperature of the air inside the oven and around the mould. If we can normalise the temperatures of the ovens within our plant then we can take one step closer to having them perform similarly.

Steps to normalising oven air temperatures:

1. Mount a temperature probe say 30cm or 1' near the mould wall, to measure the 'Oven Air at the Mould Temperature (OAMT)
2. Take note of the oven temperature set point on the control cabinet.
3. Record the OAMT during the cycle and decide on what the average OAMT turns out to be (see Chart 2). You can estimate this by drawing a straight line through the temperature trace. You may need to disregard any startup variances such as over shoot or undershoot of the OAMT due to the control mechanism employed by the burner. It doesn't matter too much the method of finding the best fit line just so long as you use the same method on all the traces.
4. Repeat with a different oven temperature of say 25C lower and check what the resultant OAMT is. Note that if you are moulding a real part you should adjust the cycle time accordingly. If you are running your process on temperature then no action is required to adjust your cycles.
5. By drawing a straight line graph between the upper and lower temperature settings you will have a 'Calibration Chart' for your oven (see Chart 3).
6. Repeat this for your different ovens and then adjust the oven temperature set point on the control cabinet to bring all your OAMTs in line with one another.
7. Remember of course if you adjust your oven temperatures you will have to adjust you cycle times but at least with this simple exercise you can make production management that little bit easier, allowing you to move moulds more freely around your plant.

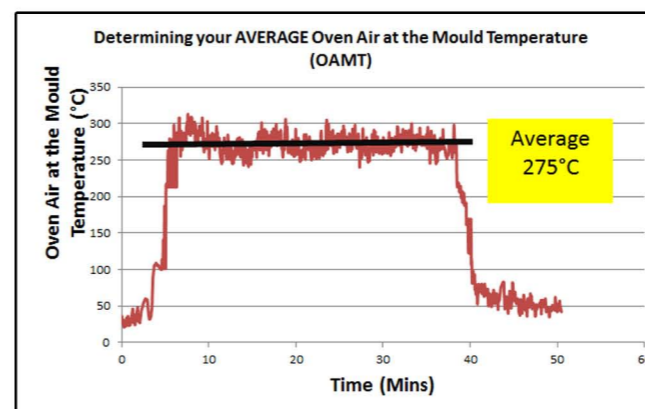


Chart 2

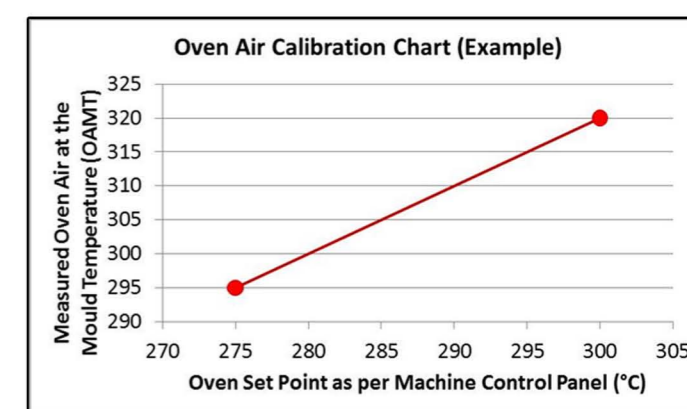


Chart 3

WATER TANK DESIGN

HOW TO ESTIMATE WALL THICKNESS FOR ROUND TANKS.

In my discussions with moulders around the world I find that many do not realise they can use a spreadsheet to estimate the minimum wall thickness for the different height levels of a water tank.

“I will discuss how to use hydrostatic pressure to calculate wall thickness for above ground tanks”

Large capacity water tanks benefit from having a graduated wall thickness, (thicker at ground level, thinner at roof level), enabling you to minimise the total shot weight.

In this article I will discuss how to use hydrostatic pressure to calculate wall thickness for above ground round, polyethylene tanks, with straight walls. I must highlight that this will only provide you with an estimated minimum wall thickness to aim for. The use of ribs, location & size of outlet hole, and the need to have a roof and floor introduce stress complications which hydrostatic pressure is unable to compute. For this you need Finite Element Analysis (FEA).

Hydrostatic pressure can be simply defined as the pressure (P) coming from the weight of the water and its value as determined by the height (H) of the liquid container and the density (SG) of the liquid. The tank walls have to be made to resist this pressure at different levels of water storage. Basically, the taller the tank, the greater the pressure on lower tank walls. (Figure 1)

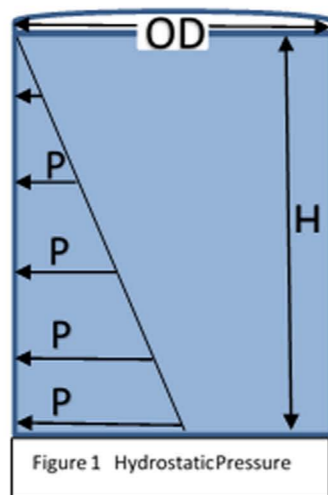


Figure 1 Hydrostatic Pressure

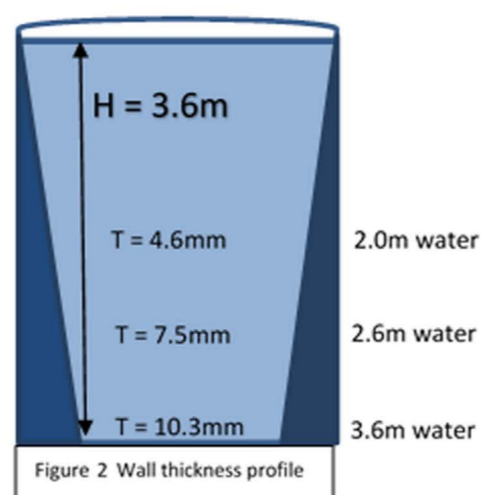


Figure 2 Wall thickness profile

The vertical wall thickness (T) of a round tank may be determined from the following equation:

$$T = P \times OD / 2\sigma$$

where

- T = wall thickness, in millimetres
- P = pressure, in megapascals, calculated as $0.0098 \times SG \times H$ (MPa)
- SG = specific gravity of fluid to be stored in the tank
- H = height of fluid to be stored in the tank, in metres
- OD = outside diameter of tank, in millimetres
- HDB = Hydrostatic Design Basis, in megapascals
- σ = hydrostatic design stress, in megapascals, after service factor is applied

As an example, I will use a 15,000L tank with a diameter of 2400mm and a maximum liquid height of 3.6m, to calculate the wall thickness at ground level. I will assume tank service temperature is 23C. For this 15,000L example, the wall thickness, at ground level, is estimated at no less than 10.3mm. (Figure 2)

You can enter this equation into a spreadsheet and quickly calculate the changes in wall thickness up the entire vertical wall – by varying the H value. The thickness is always greatest at the floor of the tank, where pressure (P) is highest.

Wall Height (H) m	Water Height m	Water Thickness (T) mm
2.5	1.1	3.2
2.0	1.6	4.6
1.5	2.1	6.0
1.0	2.6	7.5
0.5	3.1	8.9
0.2	3.4	9.8
0.1	3.5	10.1
0	3.6	10.3

Figure 3 15000L thickness profile

	A	B	C
1	Diameter	2400	mm
2	Liquid Height	3.6	mm
3	HDS Value	4.095	Mpa
4	SG Liquid	1	
5	Wall	Water	Thickness
6	Height (m)	Height (m)	(mm)
7	2.5	1.1	= (0.0098*B\$4*(B\$2-A7))*B\$1/(2*B\$3)
8	2	1.6	= (0.0098*B\$4*(B\$2-A8))*B\$1/(2*B\$3)
9	1.5	2.1	= (0.0098*B\$4*(B\$2-A9))*B\$1/(2*B\$3)
10	1	2.6	= (0.0098*B\$4*(B\$2-A10))*B\$1/(2*B\$3)
11	0.5	3.1	= (0.0098*B\$4*(B\$2-A11))*B\$1/(2*B\$3)
12	0.2	3.4	= (0.0098*B\$4*(B\$2-A12))*B\$1/(2*B\$3)
13	0.1	3.5	= (0.0098*B\$4*(B\$2-A13))*B\$1/(2*B\$3)
14	0	3.6	= (0.0098*B\$4*(B\$2-A14))*B\$1/(2*B\$3)

Figure 4 Excel spreadsheet example with thickness formulas shown

“Wall thickness is always greatest at the floor of the tank, where pressure (P) is highest”

In the case of our 15,000L tank, the estimated minimum required wall thickness profile is summarised in Figure 3.

If you are not familiar with creating spreadsheets I have shown in Figure 4 a simple formula that I used in Excel. You can copy it and check if you can duplicate the thickness results in the Figure 3.

You must obtain raw material HDB value from your supplier

You will notice the wall height at 2.5m only needs to be 3.2mm thickness. There is low pressure, with only 1.1m of water. (3.6m-2.5m = 1.1m) However, most tank standards like ASTM D1998 or AS/NZS4766 (and common sense) will tell you that you must maintain some minimum wall thickness, regardless of how low the hydrostatic pressure may be. For example, ASTM D1998 states 4.7mm is minimum thickness allowed.

One key raw material property you must obtain from your supplier is the HDB value. Any good quality, large capacity, tank grade will have this available. If the HDB value is not written on your Technical Data Sheet, make sure you ask your supplier to provide you the HDB value. You can then check your current moulded wall thickness profile meets or exceeds the hydrostatic pressure wall thickness calculations.

Get yourself informed. Ask questions of your supplier.



Ian Hansen

Ian Hansen has over 30 years experience in the rotational moulding industry and has presented around the world on the subject of quality and tank design standards. He currently provides consultancy services to the global rotomoulding community.

ianhansenconsult@gmail.com

DESIGN: THONET'S LOUNGE CHAIR 808



Cooling Jig

ROTOUSING GIVING SHAPE TO THONETS' LOUNGE CHAIR 808

With the new programme range 808, Munich based design studio Formstelle has created a lounge chair that combines maximum comfort with numerous possibilities for individualisation. The new chair plays with the contrast between a protective shell and an inviting openness, creating a place of retreat and calm. Its distinctive appearance is created through a contemporary reinterpretation of the classic wing chair, suggesting an elegant cocoon that embraces the person sitting in the chair and communicates a feeling of security. Another striking characteristic is the welcoming soft wave effect of the comfortable upholstery. This inner cushioned core establishes an intriguing contrast with the angular nature of the outer shell. A clever mechanism allows users to individually adjust the position of the chair, while a footstool enhances the product.

Formstelle Design is Claudia Kleine and Jörg Kürschner who both graduated from the Academy of Fine Arts in Munich with degrees

Thonet presented the strikingly designed lounge chair 808 by the Formstelle design team at the IMM show in Cologne.

in interior design. In 2001, they founded the office in Munich, which undertakes tasks in the fields of product design, interior design and corporate identity. The overarching spatial and substantial contexts play an important role for the design duo.

Product design goes hand in hand with comprehensive research and material experiments.

Influencing the history of design with the launch of "Konsumstuhl Nr. 14" back in the year 1859, Thonet is renowned as the oldest furniture brand in the world. They have a long tradition of striving towards creating products of the highest possible quality and developing constant renewal – yet the new lounge chair 808 was the first time Thonet relied on rotomoulding!

After being introduced to the process and its possibilities by MAUS GmbH, it was a natural decision for Thonet and Formstelle to use rotomoulding for this new trend-setting lounge chair project. Developing and shaping the rotomoulded chair parts became a key element. Giving strength and yet comfort for seating, allowing

for a secure and sturdy mounting, including different functions while featuring an accurate interface for the external PU-Foaming and the tailoring of the leather or fabric skins – were just a few of the challenges for the rotomoulded parts.

Providing a full service – MAUS GmbH was responsible for creating the CAD Design of the parts, CNC machining prototypes from plastic block material, CNC machining the rotational moulds and also manufacturing cooling jigs from MDF panels for enabling the moulder to meet the tight tolerance required by Thonet. Due to the great market response and the smooth and fast development time of Lounge Chair 808, Thonet is enthusiastic to follow up on this success story shortly.





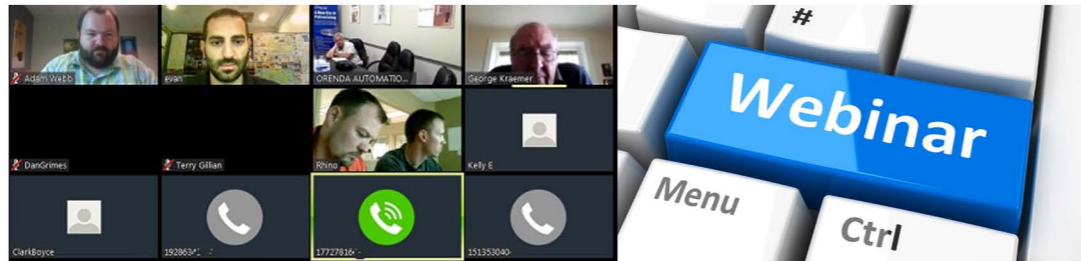
The Board and Staff of the Association of Rotational Molders wishes everyone in attendance at Nottingham a great meeting! We look forward to seeing molders from around the globe during the three days we spend in this inspiring city and venue. We also want to thank the British Plastics Federation and our colleagues in ARMO for organizing this event.

The Association of Rotational Molders is constantly working to provide excellent resources to the rotomolding community. As part of these efforts, we have developed a number of new benefits and programs since the last time we met with many of you in Lyon.

On-Demand Webinars: ARM members can now view more than a dozen webinars on demand. Most are presented by rotomolders, suppliers, and consultants thoroughly familiar with the rotomolding process. Webinars include:

- ▶ How a Rotomoulder Uses Infrared Thermography in their Process
- ▶ Determining Your True Cost
- ▶ In-Process Rotational Foam Molding
- ▶ What's Your Problem
- ▶ Turning a 4% Bottom Line into a 10% Bottom Line
- ▶ How Rotomolders Save Money by Saving Energy
- ▶ Test Method for Flowability (Dry Flow Rate) of Polyethylene Powders Using a Specified Funnel
- ▶ Roto 101
- ▶ Safety in Rotomolding & OSHA Compliance
- ▶ Rotational Molding & the Evolving Structural Part Processing Business
- ▶ Mold Release
- ▶ Assessing Your Environmental & Regulatory Compliance Footprint
- ▶ Polyethylene Industry Overview

ROTO MADE LOCAL



Troubleshooting Videoconferences: We conduct monthly video conferences open to all members to discuss questions regarding their process and to brainstorm answers. Perfect for whether you're working to solve a manufacturing problem or listening in for a continuous improvement tip.

Classic Training: Six classic ARM training videos are free to members on our website: Unlimited Possibilities, Before You Begin, Good Manufacturing Practices, Curing, Venting, and Shielding. All include Spanish subtitles.

Tours: We have added tours to our meetings whenever we've found great sites to visit. We've toured rotomolders to learn specifically about rotomolding, non-plastics manufacturers to learn about lean, and internet retailers to learn about company culture.

Roto Made Local: Working with SPE, we launched Roto Made Local, a website and marketing campaign that promotes rotomolding as a local manufacturing process.

Blog: We are quite proud of the blog we added to our website two years ago. It has been a great way to bring a variety of voices from our industry to the rotomolding community. Authors include Glenn Beall, Dru Laws, Sandy Scaccia, and many more.

WHERE IS AUSTRALASIA'S RECOVERY?



ARMA has been working on some historical records and one of our tasks has been to prepare a list of companies that have either ceased to exist or changed their structure significantly to try and gauge the impact of the economic downturn on our industry in Australia, New Zealand & South East Asia. It's been a depressing job to see a group of companies (more than 80 at my last count) that have closed their doors, sold and sometimes been resold several times and the list includes some really long term, highly experienced companies that simply haven't been able to survive the downturn. Aside from some very specific geographical areas across the region the rainwater tank industry has depressed since February 2015 when we had a brief flirtation with better times after a bad few years. Recent field days & exhibitions for the rural market haven't brought about any more positive feelings for most. Resin prices continue to go up, Australia's booming mining industry is down, consumer confidence is low and every country's sluggish rural sector all beg the question, where is the recovery for our manufacturers? It's more important than ever that we group together to support each other, network and share information to make us smarter and our companies more resilient. In these times it would be very easy for our supply chain to walk away or cut costs but this year they continue to support the industry through conference investment and through sharing information and technical information. I'd like to take moment to thank them for their very generous support, it makes a difference to everyone that our industry has a strong voice to government in these times and their financial support allows us to do as much as we can in that space as well as put together programmes to market the industry and protect our workers regardless of what sector they work in.

As we go into the Nottingham ARMO event, I will be very interested to learn how the rest of the global rotational moulding industry is surviving. It's clear that in some parts of Europe and in various product sectors the global financial crisis continues to have its impact and while some areas of the world are emerging as power houses where rotomolding is on the increase with healthy profits, more traditional sectors or areas continue to experience a very sluggish recovery.





IS SAFETY IN ROTATIONAL MOULDING MACHINES IMPORTANT TO YOU?



The British Plastics Federation, through its BPF Rotational Moulding Group, aims to support the Rotational Moulding Industry, helping it to fulfill its potential.

The BPF believes good Health and Safety practice should be available to everybody not just to its members; we share the passion for rotational moulding and we believe that working together is the way forward to fortify our industry.

As part of the BPF Rotational Moulding Group's efforts to strengthen the Rotational Moulding Industry here in the UK, the Group is pleased to invite all UK based rotational moulders to take part in discussions to finalise the "Guidance for Rotational Moulding Machines" which is already available (in draft format) for BPF Members.

Following on from the "Safety Notice" issued by the Health and Safety Executive (HSE) on 24th July 2014 and relevant to owners, designers and manufacturers of rotational moulding machines, the BPF Rotational Moulding Group decided to collaborate with the HSE to rewrite its draft code of practice in order to bring it up to date.

The second working group meeting will take place on August 20th at the BPF's offices in London at 10.30 am.

The BPF is also working in collaboration with the IT-RO, the Italian Rotational Moulders Association, and ARM-CE, the German Rotational Moulding Organisation, in an attempt to start working on a CEN standard or possibly progressing to ISO if international involvement calls for it. All interested parties; machines producers, moulders, trade associations etc are invited to express their interest by contacting the BPF directly.

For further information or to confirm your participation in the meeting, please contact Dr. Sara Cammarano, BPF Industrial Issues Executive for the Rotational Moulding Group, email scammarano@bpf.co.uk, tel 0207 457 5013

THE NEXT NORDIC ARM CONFERENCE WILL BE LOCATED AT **BORÅS, SWEDEN, THE 9TH AND 10TH OF FEBRUARY 2016.**



The Conference will include:

- ▶ The Nordic ARM Design
- ▶ The Nordic ARM Best Practise
- ▶ The Nordic ARM Run
- ▶ The Nordic ARM Quiz
- ▶ Top international speakers
- ▶ Visit to Uponor Infrastruktur in Fristad

Borås is located close to Gothenburg and has a very nice city centre. Borås is a modern city that has many sides. With its rich cultural life, vibrant city centre and many favourite little spots, there is something for everyone. Come along and discover your own side of Borås! With more than 100,000 inhabitants. Borås is Western Sweden's second largest city, and a city that is constantly changing. Some people think of Borås as a textile city. Others think of it as a city of sculptures, an entrepreneurial city, a shopping city or a design city. In fact, Borås is all of this. And a lot more.

Uponor is a leading international provider of plumbing and indoor climate systems and services for the building and utility sectors. Available in some 100 countries, our solutions meet the needs of our customers and end-users, while helping to preserve the natural environment. They are designed for efficient performance, long lifetime, easy installation and a low environmental footprint. With ca. 4,000 committed employees and a local presence in over 30 countries, Uponor is at your service all over the world.

- ▶ 4,000 employees in 30 countries
- ▶ 1,023 million Euro net sales in 2014
- ▶ Listed on NASDAQ OMX Helsinki in Finland

KEY FIGURES

	2014	2013	2012
Net sales, M€	1,023.9	906.0	811.5
Operating profit, M€	63.4	50.2	57.7
Operating profit (continuing operations), %	4.3	5.5	7.1
Profit for the period, M€	36.0	26.8	32.8
Balance sheet total, M€	681.8	661	498.5
Personnel at 31 December	3,982	4,141	3,052



Rotational moulding has come a long way in the last ten years in the StAR region. From primarily overhead water tanks rotomoulding is now evolving to design and technology based products. These are ingeniously designed products offering value based solutions. These products cater to fast growing sectors of a rapidly modernizing economy. Rotomoulding technologies and production knowhow have transformed significantly in India. Specialty materials and additives, state-of-the-art machines, engineered moulds, process controls, and increased knowledge of design and development have given a sense of confidence to rotomoulders.

Rickshaw – Intracity transport:

OK Play has announced the introduction of eRickshaw, the “eRAAJA”, using rotomoulded components and body. This battery powered, non-polluting, aesthetic, lighter weight and affordable vehicle is exactly what the country needs for last mile connectivity. Complete design, engineering and development have been conducted by OK Play since 2012. A major effort was the integration of the plastics [roto & injection] and metal parts. All CNC moulds for roto parts were designed and made in house by OK Play. The parts are moulded on state-of-the-art Reinhardt machines using hexene grade polyethylenes from Matrix Polymers.

Freezers & Ice cream carts:

Consta Cool started making Rotomoulded Eutectic Freezers in 2012. Eutectic freezers maintain the temperature of stored products when electric power is unavailable for a long time. Vending and Transportation being outdoor applications the conventional Metal Freezers had a problem of heavier weight, rusting and leakage from the metal joints. Consta Cool seized this opportunity. These carts in attractive design & colour are eye catching on the streets of main Indian metros.

In 2013 Consta Cool began developing for Hindustan Unilever a “Vending cart” for their ice cream vending operations. A Rotomoulded Freezer was developed as per HUL specs. The Freezer was tested in the field and passed all the tests. In 2014 an industrial design firm brought in by HUL, together with Consta Cool developed final shape and graphics of the Magnum Vending Cart shown here. Consta Cool designed and built all roto-moulds [CNC and fabricated] in house. Parts are moulded on a state-of-the-art Reinhardt machine with local butene and hexene PE from Matrix. The Magnum vending cart was launched in India in Jan 2015.

These developments symbolize coming of age of Indian rotomoulding, with availability and understanding of better moulds, machines, materials, design and the process. StAR has been a significant catalyst in this change.



Rotomoulded Eutectic Freezer by Consta Cool



Premium MAGNUM brand ice cream cart

UPCOMING
EVENTS

20
15

SEP
13-15



ARMO 2015 NOTTINGHAM

City/Country: Nottingham
Further Information:
www.armo2015.com

OCT
15



STAR AHMEDABAD REGIONAL MEET

City/Country: Ahmedabad, India
Further Information:
www.starasia.org

20
16

FEB
1-3



STAR ANNUAL ROTOMOULding CONFERENCE

City/Country: Goa, India
Further Information: www.starasia.org

MAR
9-10



ROTATION 2016

City/Country: South Africa
Further Information: www.armsa.co.za

JUN
12-21



ROTOTOUR 2016 AUSTRALIA

City/Country: Gold Coast, Australia
Further Information: www.rototour.com

JUN
19-21



ROTO MOULD 2016 GOLD COAST: THE ARMO CONFERENCE

City/Country: Gold Coast, Australia
Further Information: www.armo2016.com

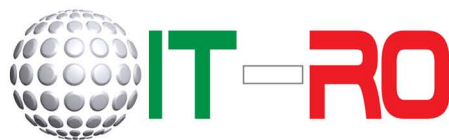
ROTO MOULLDER

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AFFILIATES



Association of Rotational Moulding (Central Europe) e.V.



ASSOCIATION OF ROTATIONAL MOULDERS AUSTRALASIA INC



Aziende Italiane Stampaggio Rotazionale

