Where in the World is Paul Nugent?

PAUL NUGENT | MNOP

Summer Hols

Time-out on a recent arduous assignment was spent examining the use of rotomolding as it relates to beaches and life-guarding – this was a tough one! A recent study shows that the average human interacts unknowingly with rotomolded parts at least three times per day – how many more might that be if we actually told them about it...?

From Crowbars to Thermocouples...

I had the pleasure of once again working with Roy Crawford at the recent ARM International Conference in Minneapolis. We had been given the task by the ARM board to lay out a path to help assess technical challenges for the industry and present our ideas at the Fall Meeting.

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It was an interesting challenge, as the way forward involves not just the technology of the process but also the rotomolding community around the world. The topics that we decided to address therefore included a look at some basic ideas for molds, materials and machines but then took a look at what an association itself can do.

Some of the steps in the process include firstly identifying what needs to be done, then prioritizing those needs, finding a way of facilitating them and then, in this cost-conscious climate, finding a way to finance them. Rotomolding is a relatively small, diverse industry which is often philosophically inclined to be low-tech (and sometimes disinclined to improve) so raising the initiative and funds for new work may be a challenge across unrelated industry segments. However, there are common areas that all can benefit from and there are many lessons to be learned from the approaches adopted by other plastics industries.

Molds, for example, are a key common area. The modern versions tend to be relatively flexible and prone to issues with expansion and contraction, which means that their long-term prognosis when exposed to manual operation can be poor. There is a dichotomy that molds must fulfill in that they ideally should be thin for fast heat transfer but at the same time must be thick to improve their durability. A new health care plan for molds would prescribe CNC machine molds wherever possible, use mold-jacks to protect parting lines and automate repetitious operations.

As an example of a needed improvement, note that molders often have the most technical of molds but then proceed to depend on steel wool to plug their vents! There has to be a better way and inventions such as Supavent are a good step but can we develop an even easier approach – a vent-sock than can be added to existing vents? We can also look at design guidelines in terms of shrinkage and material properties; incorporating multiple levels of shrink in the same mold can be done – what are the basic guidelines and is it worth the effort? Can we develop frames for molds that move and remain stiff while providing the flexibility to prevent distortion during repeated thermal cycles? What new parting line designs and technology can be developed to improve closure and eliminate flash? Can we design closure systems ideally suited to the needs of rotomolding? And what about

release agents, they have come a long way in recent years. Can we find a way of measuring how much is applied? Can their life be extended further?

Materials are also a recurring theme and while many may be rotomoldable, few typically are. The many factors which contribute to this situation include costs, difficult processing windows, lack of knowledge and a general lack of demand in the marketplace. Choosing a process for a particular product may be driven by material choices and for rotomolding to compete with other processes, we need to expand our palette. A lot of the basic requirements for suitable materials have already been defined; a program is needed to review existing plastics, screen them vs. our criteria to create a shortlist, engaging universities and research groups to look at them, supporting these groups and then have them disseminate the information to the rotomolding community with a view to commercialization.

Rotomolding machinery is versatile, simple, durable, efficient and flexible. In other words, they are cheap to operate, last forever and can be used to make almost anything we want. For new, more demanding applications, future machines need to have full-time control built-in from the start to ensure that ideal material properties are achieved and quality issues are minimized; hands-free process control using a non-contact approach makes most sense for operators. And on that theme, any economic system which can help simplify operator involvement at the machine via automation is a good idea. This can start with individual molds and spiders; develop into add-on systems for existing machines and progress to full automation of the entire molding process.

Finally we looked at the influence and responsibilities of an association in this process. Groups such as ARM International are important for the industry as they act as focal points giving a small industry sector a much larger voice. ARM International, for example, can help raise the technical profile of the industry, drive an innovation agenda worldwide and develop the industry through effective use of its committee structure and conferences. They can help identify the key areas that need work, find seed funding and encourage research partners to tackle projects with in-kind support. We hope that the ARM International group can address these areas and at the same time re-inspire their membership to contribute and become active participants rather than remain simply observers. Success in this is imperative – the alternative is just too scary to contemplate...