

Persistence Pays! Trevor Panozza, Director Ampelite Australia Pty Ltd – Composite Australia Board Member.

How the 'big end of town' within the industry can make a difference to the average member.

Having been a member of the Composite Australia Board over the past three years has enabled me to view a much wider scope of the industry. Composites have such a wide ranging format that it becomes easy to feel segregated into your own little corner. Talk of carbon fibres and the aerospace industry is a far cry from standing on a cold factory floor trying to mix a sticky general purpose polyester resin solution. It is with these thoughts in mind that I felt compelled to share a short story of how the 'big end of town' within the industry can make a difference to the average member.

This story involves two long-standing Composites Australia members: Regina Glass Fibre, an Australian glass tissue manufacturer based in Ballarat, country Victoria, and the Cooperative Research Centre for Advanced Composite Structures (Composites CRC), which has its head office in Fishermans Bend, Vic. Even in their names and locations only, one can sense the difference between the two companies!

Back in 1998, the Composites CRC was working with Hawker de Havilland (HdH) – now Boeing Aerostructures Australia - to try and develop I-Beam floor supports for the proposed new Airbus 380. The idea of the floor supports made with epoxy and carbon was to provide a strong light-weight composite and save on overall weight within the aircraft sub-structure. One of the major problems was meeting stringent flame and smoke toxicity requirements. The Composites CRC had looked at industry standard systems and ultimately came to favour a surface layer intumescent approach for their I-Beam. As it turned out, HdH were not awarded this Airbus work and so the the Composites CRC work never went ahead for the I-Beam.

Some seven years later, Arthur Rendell, Managing Director of Regina, met representatives of the Composites CRC at the May 2005 Composites Australia & Composites CRC Annual Conference. Some preliminary discussions at the conference and resultant further meetings led Regina to join the CRC's Associate Membership Program. These early discussions and site visits rapidly led to a mutual recognition that Regina was well placed to commercialise the new fire retardant technology that the Composites CRC had developed from the HdH program.

Fireshield, as the technology is now known, uses surface tissue as a carrier to place a halogen-free, fire retardant chemical just beneath the surface of composite parts. The beauty of this approach is there is no degradation of strength or stiffness of the composite section, as it remains unchanged in resin terms from normal manufacture. In other words, there is no need for additional fillers such as Antimony Trioxide or Alumina Trihydrate with the Fireshield tissue. The other major benefit of the Fireshield tissue is it can be used in virtually any process involved in the manufacturing of composites.

The partnership continued, resulting in Regina acquiring a

manufacturing licence for the production of Fireshield in March 2006, less than one year after joining the Centre. Winning a CRC STAR Award in May 2008, this successful transfer of CRC technology was recognised as a high level achievement in helping to build successful small to medium enterprises through a joint innovation initiative. Whilst this sounds impressive, the reality was the three years to this point was a long haul for Regina.

One of the biggest stumbling blocks enabling Fireshield to become commercially viable was for its ability to be used in various resin systems. The initial flame retardant program undertaken by the Composites CRC was focused on epoxy resin systems suitable for aerospace. This was another major hindrance to Regina who had already struggled to overcome problems associated within the manufacturing process involved just to produce the Fireshield tissue. These problems each in themselves were basic but also major.

- Handling of the chemical intumescent powder.
- Mixing of fine particles.
- Chemical recovery processes.
- Application and even spread of the chemicals.
- Ensuring correct quantities onto the glass tissue.

Each problem had led Arthur to consult with the Composites CRC. These consultations led to studies to determine other manufacturing queries:

- Impregnation
- Properties Influence
- Permeability
- Gel Times
- Manufacturing Defects

All these studies that had to be undertaken before Regina could even start to find industry partners to work with. Regina could not continue to make each forward step without the help of the Composites CRC team. Even in overcoming each of the problems that sprung up one after another, trial manufacturing for various processes all took time. The reason I know this is through my own involvement with Ampelite in trialling the Fireshield tissue. We too have had to consult both with Regina and the Composites CRC to enable Fireshield to run with our own form of a pultrusion process. Our initial thoughts on trialling the product were that it could never work. Thanks to Arthur's persistence and patience, Ampelite too will shortly have a new product to add to our sheet product lines.

Now, in 2009, Regina is finally ready to market the Fireshield and hopefully sell quantities to justify the expense laid out so far. The whole composites processing industry as listed below can now benefit from Regina's persistence over the past four years:



Normal Ampelite flat panel, 20 seconds after ignition.



Ampelite fibreglass panel with the addition of the Fireshield tissue, 15 minutes after ignition. Note the lack of sooty black smoke (very impressive).

- Sheet Moulding Compound
- Pultrusion Processing
- Vacuum Bag Infusion
- Hand Lay Up Processing
- Auto Clave and Prepreg Processing

Recognition of the successful application of the Fireshield to any of the above manufacturing processes was achieved when Regina recently won the JEC Asia 2009 Innovation Award in the Raw Materials category. With increasing emphasis on materials performance in fire, smoke and toxic gas emission, both for mass transit applications and for buildings, coupled with the thrust of composites to replace traditional materials in all areas, the market potential is seen to be substantial. This potential, always seen by Arthur, was perhaps overlooked by many others.

This is a fitting reward to both Arthur of Regina and the work and investigations that was performed with the Composites

CRC. Certainly from my own perspective, Ampelite is keen to now take the Fireshield product and try to forge markets in areas we once deemed "too hard" due to the stringent requirements within fire and smoke standards.

It is and should be a feel good story for the average Composite Australia member. All of us in small and medium businesses face major obstructions in trying to form new products for new markets. Even improving existing products for existing markets is easier said than done. The point is to keep trying and to persist with what you believe can be both possible and beneficial. The story also portrays that the benefits of being a member of Composite Australia are very real. The yearly conferences and trade shows do provide the opportunity to perhaps find that "Fireshield" type product that could benefit you in your small or big part of our industry. Never forget, 'Persistence Does Pay'.



Murray Scott (Composites CRC) lowering the new plant into position.



Celebration luncheon at Regina for the opening of newly installed machinery to run Fireshield.



Trevor Panozza with Paul Falzon (Composites CRC) with Star award.