The official magazine of Composites Australia Inc. | Issue 24 | June 2010

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Letter from the President

It’s already half-past 2010 – how did that happen? After what was a slow year for so many of us last year, this one seems to be flying by.

Conference 2010 has now come and gone, and indeed our first alternate year “Conference only” was successful.

Previously, after evaluating feedback from exhibitors and visitors alike, it had been decided to hold the Trade Show every other year, with a standalone conference in the alternate years. The Conference & Trade Show will return in 2011 (17-18 March, at the Hyatt Regency Sanctuary Cove), and the next ‘Conference only’ is scheduled for Sydney in 2012. The event, even when not in conjunction with an exhibition, will continue to feature presentations, workshops, tutorials and practical demonstrations and, where possible, factory tours.

A few companies indicated they had too much work on to attend, or, could not spare any workers; I hope this is a positive indication for the state of the industry! Several of our speakers were South Australians, and our total attendance was excellent. We also thank Adelaide business Fibrelogic Pipe Systems for hosting the tour of their impressive facility – it was “sold out”, and was uniformly praised in the post-event evaluations.

Read the reports about the Conference on pages 9 – 14.

The composites industry is maturing, and the relevance of associations around the world is changing. I believe it is time for CA’s role “to promote the use of composites” to be expanded to look toward educating engineers and other end-users on the characteristics and benefits of composites, and to also focus on an educative role for our members.

Given the limited Australian population, CA can’t (and doesn’t try to) compete with ACMA or JEC with regard to size and variety of offerings in conferences & exhibitions. Our conference and trade show is in fact increasingly focusing on training – with demonstrations, workshops and tutorials – and I am very much in favour of this trend.

Your Composites Australia Board will be proactively working in 2010 and 2011 to develop an educational program that is well-suited to our members.

We have a number of new Board members this year whose experience in composites and education will be instrumental in implementing our plan to have an Australian certification system for Composites in place, to assist our members with staff training. We are actively working with various engineering groups to also offer educational opportunities for engineers who may not have a detailed understanding of composites.

I appreciate the feedback I had in Adelaide regarding more business management type courses to assist our members with the administration of their businesses and we have commenced looking into suitable offerings for 2010/2011.

Along with Keryn Caulfield and the staff at Apical we are actively keeping Composites in the view of various levels of Government. We also wish to provide for our members in other ways and we appreciate any feedback from you as to how you see we can actively assist you in your composites business.

We also have taken the opportunity to introduce members to the initiatives available through Enterprise Connect. For a small business this can be a very positive indication for the state of the industry!
helpful federal government service that is designed to assist with making your business more competitive through effective business management, which is initiated through a preliminary review of your business by experienced business advisors, at no expense. You might like to consider this for your business.

Yet another opportunity that you may be interested in is the forthcoming JEC Asia exhibition which is being held in Singapore in October, 2010. If you are thinking of exhibiting at JEC Asia then please consider the facilities that Composites Australia has been able to organise for our members at this particular composites exhibition. There is more information detailing what is available within this issue and for further information please contact Kenyn or Ann.

June, in addition to being halfway through the calendar year, also heralds the start of a new financial year, and with this renewal comes membership renewal.

For Composites Australia to grow and improve it needs membership commitment. Members must renew their memberships. The association provides the industry with an enormously valuable reserve of industry history, local and international industry contact networks, industry training, representation on government committees/standards and workplace health and safety information, just to name a few benefits!

Could you independently acquire and source the information and the network that the Association provides for even close to the price of membership?

I’m sure you all appreciate the amount of effort that goes into organising the facilities that Composites Australia provides to its members; consequently your continued membership is fundamental for the continued service to the industry. Keep in mind also that in addition to its members, the association assists the general public with their enquiries – and the majority of those calls are about where to find a particular service or product capability. We can only refer these enquiries from the general public to financial members.

Composites Australia is committed to YOU – we ask that you remain committed to the Association by renewing your membership.

Best wishes to everyone for the new financial year.

Genelle Coghlan

JEC ASIA – Apply to participate or enter Innovation Competition now!

In 2009, Composites Australia members Regina Glass Fibre, Ampelite Australia and the Composites CRC were joint winners of an Innovation Award at JEC Asia. In 2010 it could be your company!

The JEC Composites Show Asia will take place on October 12-14, 2010 in Suntec Singapore International Convention & Exhibition Centre, Singapore.

JEC invites you to involve your company in either or both of two highly regarded programmes: JEC End-users forums and JEC Innovation awards. Participation is free, but deadlines are short, as JEC will publish the forum program and award brochures by the beginning of July. Make sure your company is included in the nomination lists!

End-users forums include: Aeronautics, Automation, Automotive Ground Mass, Construction and Infrastructure, Energy Transportation and Water solutions and Marine.

Count your company in and be a speaker! Present your latest technological innovations to an international audience of (continued on to next page)
Part 1 – The Issues

In a several part series we will look at the engineering issues in joining composite structures with bolts, rivets, pins, etc. In this article, we consider the issues in a broad sense and will discuss them in detail throughout the coming series of articles.

The joining of advanced composite structures is a challenging design issue, particularly with the use of mechanical fasteners. Bolted joints in composite structures have several issues to be addressed in the design process. These design issues include: bearing strength, fastener tipping and clamp-up, ply configuration effects, fastener hole preparation, corrosion and overall joint configuration limitations. There are 10 major issues engineers face when developing bolted joint designs in composite structures. These 10 major issues are:

1. **Bearing strength** – typically the bearing strength of composite materials is relatively lower than that in metals, and the bearing strength is a function of the ply orientation and distribution.
2. **Fastener hole preparation** – drilling and reaming the fastener hole requires care so as not to damage the exit side of the hole and thus reduce bearing strength.
3. **Fastener installation** – likewise to hole preparation, fastener installation requires careful consideration not to damage the composite laminate.
4. **Corrosion** – the attachment of composite and metal structures with metal bolts can be a source of corrosion damage of the metal if appropriate installations processes are not followed.
5. **Fastener interaction** (pull-through, bending) – there are significant factors to consider in the way a fastener interacts with a composite structure whilst under load.
6. **Clamp-up** – How much should you tighten a fastener that bears down on a composite structures? What is the crushing resistance of the composite through-the-thickness? Such questions can be answered with proper understanding of composite material properties and directional relationships.
7. **Stress concentrations** – whilst a bolt fills the open hole in a structure there is still a stress concentration effect in both tension and bearing failures modes. Composite laminate configurations play a key role in the variations of the local stress concentration factors of bolted joints.
8. **Multiple row limitations** – unlike metallic structures that have a better multiple row load sharing capability (due to local ductility), composite structures are linear elastic to failure and thus require better understanding of multiple rows of fastener bearing/by-pass load interaction.
9. **Ply configuration effects** – both the percentage of fibres in any one direction and the through-the-thickness placement of the plies requires an understanding of the effects on structural performance of mechanically fastened joints in composite structures.
10. **Off-axis loading** – because composite laminates are general orthotropic any loading off the material axis results in general orthotropic behaviour. This has significant implications for the laminate design with fasteners that are loaded off-axis.

In the next article we will discuss the bearing strength of mechanical fastener design issues in composite structures.

I also welcome questions, comments and your point of view. Feel free to contact me via rheslehurst@adfa.edu.au. I may publish your questions and comments, and my response in future newsletters.

(continued from the opposite page)

Conference: Economics Conference on Asian Pacific Markets

decision-makers who represent users, raw materials producers, processors, R&D specialists, journalists and academics. It is a unique opportunity to share your composite experience, exchange knowledge and information with experts worldwide, so that we can expand the composite industry. Abstracts must be submitted by 4th July, 2010.

The JEC Innovation Programme is a worldwide competition. The objective is to spot, promote and reward the most effective composite solutions that create value for end-users.

More than just a competition, this is a real innovation database and includes an Award Ceremony during the show and a showcase on the JEC Composites Show floor. The contest is already on for 2010, so don’t wait to submit your application in one of many categories opened. Entries must be submitted by 4th July, 2010.

Life Achievement Awards:
For the second edition in 2010, JEC will honor again a single individual for his or her lifetime contribution to the composites industry. This Life Achievement Award will be given to a major Asian/Oceanic captain of industry having devoted a career to composites.

The recipient should be one who fundamentally advanced the composite industry and whose achievements had been acknowledged by the market and his or her peers. The work of the recipient will have withstood the test of time.
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Using Technology to Compete with China

By Alex Kryger, Aptec Composites (& CA Board member)

Manufacturing in western countries including Australia has been progressively moving to developing countries such as China. Some industries such as clothing manufacture have almost completely moved to countries with cheap labour and lower overheads.

The Composites Industry is expected to grow steadily in the coming years. With a significant volume of fiberglass parts already manufactured in developing countries, how do we stem the flow of work offshore and protect the Australian composite industry?

Firstly we need to understand the strengths and weaknesses of our competitors.

The main motivation for companies moving offshore is of course financial. On the surface cheap labour, cheap materials and low overheads mean cost savings and better profitability. This however isn't always the case. Cheap imported parts are often of poorer quality. You need to start with high quality materials to make high quality parts; these materials are not always cheaper in developing countries. Dealing with developing countries can also have other pitfalls besides quality. Logistical problems and shipping costs, language barriers, political instability and/or policy uncertainty, loss of control of IP and the risk your product will be copied are just some of the issues. Thus, it's hardly surprising that many companies that go off shore don't always find it to be the cost saver they had anticipated, while adding to the risk and difficulty of running their business. These all become good reasons for industry to stay local and some businesses are coming back to locally manufactured parts after having problems offshore.

Price is important, but there are many factors; we don’t compete with on base price alone. The Australian composites industry will gain or lose the competitive edge on China based largely on how well we are able to increase our level of skill and technology to increase quality and productivity whilst keeping costs down.

There are many ways to increase quality and productivity through technology. Technology is more than just expensive machinery; it also encompasses systems and ‘know how’. Some of the greatest cost savings and productivity gains can be obtained by simply implementing systems such as 5S housekeeping systems, and the ‘know how’ that comes with highly skilled staff. These are fundamental to running a competitive business. Once in place, computers, automated machinery and more advanced processes can be used to maximum advantage.

3D modeling and computer design tools are being used more and more throughout our industry as a whole. This has greatly improved the product design and allows for subsequent changes to be done quickly and with minimal risk. Computer designs have the added advantage of being able to be used directly to run automated machinery. By having the ability to work with 3D drawings many projects can be done with a higher degree of accuracy and certainty, and in less time than using mockups and hand sketches. Once we have design data in electronic form it can be used to support a host of automated processes.

CNC Routers, water jet cutters, automated fabric cutters and alike can make a big difference to productivity in the right circumstance and can add to accuracy, repeatability and quality. Using a CNC router to produce patterns allows for greater flexibility in design and a high level of detail, compound curvature and tight tolerances. It does this without adding much to costs compared to simpler designs. It also reduces the time it takes to produce prototype parts and/or production moulds.

Automation usually works best where we need to repeat the same thing, or similar things, continuously. CNC routers and water jet cutters can cut flat sandwich panels or fiberglass sheeting and even trim 3D fibreglass parts. 3D scanners can aid in product development and part verification. Processes and technologies such as RTM can improve part appearance as well as production time. Infusion can increase strength and reduce weight.

All of these technologies can improve quality and productivity. When it comes to using technology, we need to know what’s the best tool or process for the job we are doing. For this we need to keep up to date with new ways of doing things and new technological developments. Using technology in this way can make a significant difference to competitiveness.

Although many of the competing countries have these technologies it also largely comes down to the skill of the people using the technology. By using technology in an appropriate way and having highly skilled staff we can push productivity and quality up and price down to make us more competitive with countries that have cheap labour.
Take a look into the future...

... and discover tomorrow’s innovations today.

Markets and processes are changing continuously. With the ever growing need for stronger and lighter cars, trains, aircrafts, boats and bicycles, innovative materials such as composites play a decisive role. They meet and exceed these requirements with a multitude of possibilities in the production and development of these markets.

Discover the possibilities at COMPOSITES EUROPE 2010 in Essen, Germany. We will show you solutions for all of these industries and applications.

Find out more about COMPOSITES EUROPE at www.composites-europe.com.
The seventh annual Composites Australia and Composites CRC Conference was held on 29th – 30th April 2010 at the Stamford Grand Adelaide in Glenelg, South Australia.

This was the first year of the new timetable for this event, wherein a stand-alone conference is held every other year, alternating with the conference plus trade show format. Practical demonstrations, workshops, tutorials and a factory tour made up the programme along with presentations. It is clear the event has support from industry and continues to serve a very worthwhile purpose for those who attend. Delegates represented some 100 companies or organisations, from all states of Australia and from eight other countries.

A Welcome Drinks social event was held on the Wednesday evening for any attendees who arrived early, and was the first of a number of networking opportunities for people to meet and catch up – and, of course, do business!

On Thursday, delegates checking in received their name tags (featuring Colan Australia lanyards), the always-coveted FG1 satchels, the Programme (sponsored by Hitco Carbon Composites) and also USB drives, sponsored by Owens Corning and containing a copy of the presentations that would be given at the Conference. (Those presentations which were not available at the time the USB drives were loaded will be available for delegates on the Conference website).

The official Conference Program began with a plenary session. The President of Composites Australia, Genelle Coghlan, welcomed delegates and then introduced Prof. Murray Scott, CEO, Composites CRC, to chair the session.

Keynote speaker Fred Abbink, from the Dutch National Aerospace Laboratory (NLR) (Germany), presented a paper on "The Past, the Present and the Future – Three Generations of Composites Development at NLR" which discussed the three generations of composites since the 1940’s, and the design drivers from each. Our next keynote speaker, Scott Beckwith from SAMPE in the US, then spoke about current market trends and needs in the materials and manufacturing areas associated with a number of energy-related technologies. (see more detail on both plenary presentations, page 12). All speakers received an elegant wine carrier, in keeping with the Adelaide area’s famed wine regions.

Following the morning tea break, the conference split into parallel sessions. Over the two day program, 35 presentations, 2 workshops, a tutorial and 8 practical demonstrations were delivered across an array of subjects from the academic sector, bio-composites, repair technologies, tooling and infusion along with themes helpful to those running fabricating businesses. The presentations on Thursday ranged from "Calculating the Embodied Energy of Composites" and "Self Sensing Composites" to "Innovative Timber Pile Rehabilitation Technique using Fibre Composites", and more.

This was the first year that practical demonstrations were part of the program as presentations, rather than being given only during breaks or in the exhibition. This worked very well and allowed larger audiences to view each demonstration. The demonstrations included vacuum infusion, impact testing, non-destructive and ultrasonic testing, and adhesive bonding. Rockets, hydrofoils and hovercrafts were also on the program and on display.

On Thursday, featured demonstrations included two systems for testing composites structures without inflicting damage: Evisive’s Non-Destructive Microwave Inspection of Composite Structures, and Olympus Australia’s Ultrasonic Testing of Composites. Attendees could even bring along a structure of their own for free testing. On the other hand, DIAB Australia definitely tried to inflict some damage with their demonstration of "Impact Performance of Composite Panels".

On Thursday evening, the Conference Dinner, sponsored by Regina Glass Fibre, was as always a great time to relax and enjoy being with industry colleagues, partners, and friends. The band, Flaming Sambuccas, definitely caught the crowd’s attention, and even got a few dancing on stage! The dinner giveaway, sponsored by both Regina and Advanced Composite Structures Australia (ACS-A), was again in keeping with the wine region.
theme: a "wine waiter’s friend": corkscrew, bottle opener and foil cutter. However, a number of delegates travelling with carry-on luggage later reported sadly that their dinner souvenirs were confiscated at the airport.

Friday morning started bright and early with those registered for the factory Tour of Fibrelogic Pipe Systems boarding the bus at 7 am. This tour was a first-come first-served option limited to 48 – and it “sold out”. One participant remarked on the feedback survey, “A conference highlight! Would appreciate more opportunities like this!” In survey results, the Factory Tour was rated as “Excellent” or “Great” by more than 90% of those responding.

Those who did not go on the tour could instead start off Fabricators Friday listening to a talk on the Use of Composites in the Construction of Flying Model Rockets (with rockets on display and videos of actual launches), while other delegates attended a presentation on GRP in Recycling Water & Desalination Water Industry – a big topic for the industry.

Fabricators Friday, sponsored this year by the University of Southern Queensland’s Centre of Excellence in Engineered Fibre Composites (CEEFC), also featured a smattering of everything. There was a “show and tell” from local Norm Clements of The Innovation & Training Skills Centre and Murray Bridge High School on “The Hot Rod Project & the FGI Low Shrink Tooling System” and a talk on “Traditional Peroxides Used in a Non-Traditional Way” by US speaker Denny Fink of Syrgis Performance Initiators. Demonstrations included two live vacuum infusions and a plexus adhesive lesson. There was also a workshop on risk assessment, Scott Beckwith talking on Tooling Technology, a supplier session from Australian Composites on pre-pregs, and presentations on gelcoats and on quality control in composites manufacture.

At the end of the day, Fab Friday delegates’ names were entered in a draw for $1000 worth of Nupol products; with help from Tim Banicevich’s daughter Ariana, James Lucas of Nupol in Adelaide drew the name of the lucky winner: Peter Eagles of Etamax Engineering (see photo page 14).

Full Conference delegates could also choose to attend the second stream of presentations on Friday – including a highly-rated discussion of aspects of the design and fabrication of corrosion resistant fibreglass reinforced plastic equipment, titled “The Devil is in the Detail”, by Dennis Southam. The presentation outlined specific details which are critical to successful long term performance, such as resin selection, ventilation for atmospheric tanks, detailed procedures for site work, support foundations, design of man-ways and lifting lugs and fabrication of shell to base connections. A number of case histories were given, illustrating where catastrophic failures have resulted from poor design, fabrication or lack of attention to detail.

Also on the programme were not one but two talks on production of GRP Pipes – one by local manufacturer Martyn Manuel of Fibrelogic Pipe Systems, and one from Marco Volpi, who flew in from VEM Spa in Italy to attend and speak to delegates. Richard Downs-Honey from SP-High Modulus in New Zealand gave a highly entertaining and also thought-provoking, informative presentation on the capabilities and potential for composites, “From Boats to Buildings, and Between”.

At the end of the day our Wine Region theme continued once again, with the wine country being brought to the delegates. Willunga Creek Wines/ Black Duck Cellars brought a selection of reds and whites for delegates to taste and compare – and to purchase. It was an enjoyable opportunity for that last bit of networking and socialising! Of course, a number of delegates stayed on in gorgeous Glenelg for the next day or two, enjoying the beach, the trams, the zoo and wineries, and perhaps catching up with others again for dinner.

Next year’s Conference & Trade Show will be held 17-18 March 2011 at the Hyatt Regency Sanctuary Cove. Composites Australia will be taking the feedback from delegates from this year’s event into account in planning the programme for 2011, and also welcomes early indications of interest for presentations, demonstrations, trade displays and sponsorship!
The 2009 CA Industry Award for the Best Employee or Student working in the composites industry was presented to Jarrod Browne of Van Munster Boats (NSW) at the Annual Conference held recently in Adelaide. The award was based on his achievements both at Hunter TAFE and in his workplace at Van Munster Boats.

The award included a cheque for $500.00, a one-year membership in the association, and a full registration for the Composites Australia & Composites CRC Conference in Adelaide, including a return flight and a night’s accommodation at the Conference hotel. The Award was presented at the Conference Dinner, where Jarrod thanked Composites Australia and said a few words about his interest in the industry and his experience to date.

Jarrod is a most worthy recipient. He has not only been recognised by CA for his efforts but is about to receive another industry award for his achievements as a shipwright. Jarrod has also achieved the highest average score throughout NSW for his Certificate III in Marine Craft Construction, which he attained from TAFE NSW – Hunter Institute.

Jarrod is finishing off a shipwright’s qualification while working for Van Munster Boatbuilding of Morisset, NSW. While Jarrod has humbly accepted the award, he believes that his workmate, Mitchell Gulpers, is as motivated and talented as he is. “The award could have gone to either of us. Mitchell has also done well in attaining his Certificate III in Marine Craft Construction”, Jarrod noted.

Wayne Groot from Hunter Institute, who was instrumental in nominating Jarrod for the award, says that Jarrod was always there to assist others & motivated enough to push for more knowledge especially on closed moulding technologies.

Keith & Brett Van Munster could not be any happier with their charges. Keith commented, “It is very difficult to get one apprentice who could turn out to be a leader in their field but to get two at the same time, I’m very lucky. They have both adapted quite well to the older traditional ways and are also keen to introduce more up to date methods & technologies.”

Van Munster Boats exhibit a diverse range of technical capabilities and specialise in the fabrication of high strength, lightweight composite structures. Their team is equally experienced in general hand laminated composites through the use of advanced materials, their associated processing, and the construction techniques used in carbon fibre pre-preg fabrication.

Examples of completed & ongoing projects that form part of their general business activities are construction of 12ft, 16ft, 18ft skiffs & International 505 class sailing dinghy for both local and overseas markets. They have designed & developed the Sanctuary 620 Day Boat as well as many custom yacht projects. They have also provided tooling & fabrication expertise toward defence & aerospace projects.

I caught up with Jarrod after the conference to ask him his thoughts about the future. He was blown away by the many “snap shots of industry” he was able to see at the conference. He suggests that at the very least, all apprentices should make an effort to attend these events as much as they can, if they want to succeed later on in their careers. “I’ll be certainly encouraging my boss Keith to come to the next one”, said Jarrod, “and I’ll be trying to do more in resin infusion!”.

Jarrod would also like to travel overseas to Europe & US to see what they are up to and hopefully bring back some new or updated skills. “I might even have a go at teaching, to give back a little to an industry that has treated me pretty well,” he stated.

Applications for the 2010 Award will be sent out to all CA Members later this year. Do you have a student or employee who could qualify? It’s definitely a prize worth winning!

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In his keynote address, “FRP and Advanced Composites: Contributions to Our Expanding Energy Market Needs”, Dr. Scott W. Beckwith, International Technical Director of SAMPE and President, BTG Composites Inc., spoke about current market trends and needs in the materials and manufacturing areas associated with a number of energy-related technologies.

Dr. Beckwith said that the satisfaction of worldwide energy needs has been changing significantly such that a number of market opportunities have been opening up. Expansion is occurring in the use of both traditional FRP composites and advanced composites. Wind turbine blades, compressed natural gas (CNG) tanks and hydrogen tanks represent several markets where technology straddles both high tech and low tech materials and manufacturing needs. At the same time there are continued developments in pursuing oil and gas in regions, and at depths, that continue to push composite materials technology.

Dr Beckwith covered the development, use and repair of wind turbine blades, the variety of types and sizes, and what the growth of this industry means for those in the composites industry. Blades are getting bigger. Along with the increase in size and the resulting increased use of composites (especially carbon fibre) comes the need for in-situ repair technology.

With oil and gas, CNG, NGV, and LPG storage tanks come into play. Pressure vessels for the storage of liquid gas are often made of composites, metal or plastic liners wrapped with FRP. Composites filament-wound vessels are lightweight, economic, and demonstrate little fatigue or corrosion.

The fastest growing alternate fuels and/or energy sources today and for the foreseeable future are: wind energy, ocean energy technologies, oil & gas (CNG, NGV, LPG, hydrogen, and storage and transportation tanks), biofuels and increased interest in nuclear energy renewal. The composites industry can provide the tools for the utilization and performance of these sources and therefore can take advantage of the growth for its own advancement.

Fred Abbink, who recently retired as General Director of The Netherlands National Aerospace Laboratory (NLR), presented a keynote talk on “The Past, the Present and the Future – Three Generations of Composites Development at NLR”.

He noted that composites are being increasingly used in both secondary and primary aircraft structures. The introduction of these materials began during the Second World War (WW II) with applications for radomes. After WW II, composites were progressively applied in a range of other secondary structural components, including an important step when the first thermoset pre-preg systems became commercially available. The materials were processed in autoclaves, the main applications being box type structures, like movables, control surfaces and stabilisers. These were the first generation composites. Weight was the primary design driver for use of these components.

In the 1980s, a change in primary design drivers occurred: the main focus became cost reduction. The composites community began researching and developing new materials and new manufacturing methods. One new manufacturing process was resin transfer moulding (RTM). At about this time a new type of material was introduced: the fibre metal laminate.

Later on, new automated manufacturing technologies like tape laying and Advanced Fibre Placement became available. In addition, the first thermoplastic applications came onto the market. From the mid eighties up until current times is considered the period of the second generation composites.
Until recently, most composite structures could be characterised as “black aluminium designs”, in which fibre orientations are limited to 0°, 90°, and ±45°. However, now that automated manufacturing technologies are being introduced, such as Advanced Fibre Placement in combination with active Fibre steering and individual tow control, a whole new composite design model can be developed according to the theory “put the fibres where the loads are”. These new innovative composite design concepts are being identified as the third generation of composites.

Mr Abbink’s presentation addressed the activities of NLR over the years for the three generations described, in the development of new structural concepts and manufacturing technologies for composite materials and fibre metal laminates. Emphasis was on the NLR activities in RTM for thick composite components, glare as a fibre metal laminate application in aircraft fuselages and advanced Fibre Placement in both thermoset and thermoplastics.

Repair of composites was a popular topic. Mentioned by Scott Beckwith in regard to in situ repair of wind turbine blades, it was also the subject of the 1-hour tutorial session by Rik Heslehurst, specifically aimed at engineers who are responsible for the design development of repairs to primary and secondary composite structures.

The tutorial provided an understanding of the skills involved in repair design development, needed to improve the structural integrity of repairs and significantly reduce the likelihood of TFO (Things Falling Off). It followed the basic repair methodology in the assessment of damage based on NDI results, the determination of structural integrity loss, which in turn leads to the type of repair design required, the analysis of a repair joint and the repair scheme instructions application.

Michael Bannister of the Composites CRC also spoke on this area, giving an “Overview of Emerging Repair Technologies for Composites”. Starting with repair preparation, automated scarf repair using robotic grinding is one emerging technique. The application of a composite bonded repair includes emerging technologies for the hard patch system as well as double vacuum bagging and the development of new materials, specifically suited for vacuum processing. In the aerospace industry in particular, there continue to be issues in regard to composite repair certification, from design and analysis using proper material allowable data and structural tests, to post-bond inspection techniques. Structural health monitoring is an advancing area that may be specially focused in the area of certification of composite repairs. Advancements in the area of high temperature structural repairs were also discussed.

As the use of composite materials has increased in applications such as aerospace, automotive and wind energy generation, so has the need for methods to reliably and accurately test these materials. Two speakers presented information on the technologies available to test for damage in composite structures without causing damage.

Alison Glover from Olympus Australia reviewed the theory of ultrasonic(UT) non-destructive testing and discussed recent developments and practical examples of testing composites using conventional and phased array UT. Such testing includes thickness measurement and detection of delaminations, porosity and disbonds in materials such as honeycomb composites, carbon fibre reinforced polymers and fibreglass.

Mike Leggett from Oceania Composites Engineering gave a presentation for Evisive Inc on non-destructive examination (NDE) of composites. The structures of new composite materials are often complex, involving multi-layer laminates over honeycomb and other 3-dimensional structures. The geometrical complexity of these structures, coupled with the embedded fibres and fabrics makes inspection very challenging. Conventional NDE techniques have found limited application, but many of these new structures have been considered essentially uninspectable. The ability to look deep into a structure, beneath the outer laminate to find defects is highly desirable. Also, the ability to detect and size “stacked” defects, where a second delamination or similar defect lies beneath a first has long been sought. Mike spoke of an emerging technology whereby microwave interferometry is used to image just such deep and stacked defects in modern composite structures. Specific examples given showed microwave inspection images of multi-layer laminate covered honeycomb structures, as well as other geometrically challenging specimens such as helicopter rotors. Additionally, a comparison was made of the inspection results obtained using the new technology and an existing NDE method on the same calibration standard.
Conference Winners!

Winners of prizes at Conference 2010 include:

- **Early Bird prize draw** – Simon Heading of Lavender won the complimentary overnight stay at the Stamford Grand Adelaide hotel, including breakfast for two. Simon is Queensland-based but has family in Adelaide!

- **Fabricators Friday Draw**: Peter Eagles of Etamax Engineering won the voucher for $1000 worth of Nupol products, donated by Nupol Composites.

- **2009 CA Education Award**: Jarrod Browne, Van Munster Boats. This prize consisted of: $500 cheque, airfare & accommodation for Conference 2010, and a 1-year membership in Composites Australia. See article on page 11.

State News

Victoria

**Ken Slater appointed MD of Exel Composites Australia Pty Ltd**

Mr. Ken Slater has been appointed Managing Director of Exel Composites Australia, effective March 15th 2010. Ken holds a B.E. Degree (Electrical).

Over the last 15 years Ken held various management positions within Siemens Australia. As the Executive General Manager for Siemens Building Technologies, he was responsible for the success of the division in Australia and New Zealand. Over the last 12 months he has been employed by the A. G. Coombs Group in Melbourne to develop and implement their CRM processes and the change management required to develop their strategic sales.

“Ken’s experience working with global organizations and his understanding of the processes involved will allow Exel Australia to leverage and contribute to the Exel Group global best practices. His extensive experience in strategic sales and CRM will allow the local organization to drive sustainable growth focusing on developing niche markets”, Vesa Korpimies, CEO of Exel Composites, says. Ken reports to Vesa Korpimies.

Exel Composites, 991 Mountain Hwy, Boronia VIC 3155 www.exelcomposites.com

Western Australia

**Gary Loder**

It is with great sadness that the Composites Industry were informed that Gary Loder peacefully passed away, after a two year battle with cancer. Gary had been an enduring servant of the composites industry spanning over some 37 years. During this time Gary was Chairman and held various other board positions with the WA Chapter of the Composites Industry Association. He was also State Manager of Huntsman Composites.

Gary will be missed by his many friends in the industry.

New South Wales

**Visit to Coal Washery**

On Friday 26th March, members of Composites Australia, along with members of the Filtration and Separation Association of Australasia (FSAA), had an informative briefing and tour at the West Cliff Coal Washery, Appin NSW.

The West Cliff Mine extracts coal from the Bulli Seam using one longwall and five continuous miners. The West Cliff washery is capable of processing in excess of 4.5 million tonnes. Clean coal from West Cliff is then stored on site or trucked to BlueScope’s Steelworks or to the Port Kembla Terminal for export.

The group was given a most informative tour by BHP Billiton staff Phil Howes and Geoff Faulks. The composites group expressed interest in the infrastructure, tooling and storage works, and considered the opportunities for composites fabricators. Following the tour, the group transferred from the site to the local Appin Hotel for a very enjoyable networking session.
Airtech Advanced Materials Group Introduces New Technology and Products

**Beta Prepreg tooling, based on Henkel’s Benzoxazine Resin technology**

Airtech is proud to introduce its latest development in composite tooling: Beta Prepreg, based on Henkel's Benzoxazine Resin technology is a unique room temperature storage tooling prepreg which delivers superior laminate properties to conventional epoxy systems. Beta Prepreg tooling is based on Benzoxazine resin chemistry.

Beta Prepreg systems take advantage of the latest resin and latest toughening technology to provide outstanding ease of use and performance.

Beta Prepreg tooling is stable for a minimum of six months at room temperature. It has an exceptional low resin shrinkage during cure and develops a very high glass transition temperature, benefiting users with reduced logistical costs, more flexible workshop scheduling and extended tool life.

**Features and Benefits:**

- Exceptionally long out-life allows virtually limit free tool fabrication time. Customers benefit from increased work crew flexibility and can work around scheduling conflicts. Larger structures are possible with smaller work crews.

- Excellent post machining quality of Beta Prepreg laminates allows machining of complex geometry details and maintenance of very tight dimensional tolerances. The ability to modify tool surfaces following engineering change reduces cost of new tool manufacture.

- The outstanding toughness, high glass transition temperature and stability at high temperature ensure long tool life, reducing the cost of remanufacture and rework through product life.

- Exceptionally low shrinkage improves tool surface quality and reduced need for part finishing. Low shrinkage also reduces residually laminate stresses.

- Very low moisture absorption in comparison to epoxy systems makes Beta Prepreg a perfect tooling choice for moisture sensitive component resin systems.

Please contact our Customer service department for further information:

email: airtech@airtechintl.com
Phone: 714 899 8100
Website: www.airtechonline.com

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**The NEW Airpad CR and FR Reinforcements.**

The New Airpad CR and Airpad FR work to reinforce Airpad rubber. Each material is an open weave construction of carbon (Airpad CR) or fiberglass (Airpad FR) that has been impregnated with Airpad, allowing superior bonding when cocured with Airpad rubber. Airpad CR or Airpad FR are used in the construction of Airpad cauls to provide amore flexible reinforcement than Toolmaster® prepregs. Airpad and Reinforcements.

**Benefits**

- Airpad CR & FR feature superior rubber to fiber bonding.
- Users benefit from longer life flexible caul sheets and reduced cost of rework in manufacturing.
Welcome New Members

Composites Australia Welcomes New Members:

- Ausbond Pty Ltd (VIC) - Peter Swampillai, Commercial Director
- Cray Valley Australia Pty Ltd (VIC) – Laurance Beston, Managing Director
- CSIRO – Textile & Fibre Technology (VIC) - Scott Barnes
- Jarrod Browne - (student, Newcastle TAFE and Van Munster Boats, NSW)
- Raju Raju - (student, University of New South Wales)

New Member Profile: Ausbond Pty Ltd

AUSBOND Pty Ltd is an Australian owned manufacturer and supplier of top-of-the-range quality composite products, core bedding & bonding putties, TAQ3 range of body fillers & building/wood fillers, specialised grouting putties and new age adhesives. ‘We are experts in composite/fibreglass bonding’.

Our portfolio of customers ranges from small to large boat and cruiser builders, truck builders, spa and pool manufacturers, commercial and industrial users, other fibreglass fabricators along with authorised distribution provided by fibreglass, paint and retail product distributors. Our key ability is being able to customise products to the ever changing needs of our customers. Ausbond also provides manufacturing solutions including various options for tolling and decanting.

Call Ausbond on (03) 9792 9818 or contact an authorised Ausbond distributor for more information.

New Member Profile: CSIRO Materials Science and Engineering

CSIRO Materials Science and Engineering (or CMSE) is one of CSIRO’s largest Divisions, spread over six sites in Eastern Australia, and providing a coordinated approach to industrial research in materials design, creation, characterisation and application. CMSE’s strengths lie in fibre technology, advanced materials and the physical sciences. It provides R&D, testing and consulting services to the fibre, manufacturing, advanced materials, energy and security industries. Its capabilities are broad and cover (i) textile and fibre technology (ii) surfaces, thin films and interfaces (iii) metals and ceramics and (iv) devices, engineering and systems.

Research activities focus on (i) advanced fibrous materials and composites (ii) sustainable polymeric materials (iii) advanced engineered technologies (iv) manufactured devices (v) nanoadditives for the fine chemical industry and (vi) industrial research and testing services for the textile and building & construction industries.

CMSE has six sites in Victoria, NSW and Queensland and has R&D and commercial linkages with businesses large and small, from short term research contracts to long term collaborations. To coincide with the launch of Valspar Composites, we are also pleased to announce the introduction of the Valspar Composites website, www.valsparcomposites.com.au, which will be accessible from 1st June.

To find out more about Valspar Composites, visit www.valsparcomposites.com.au

Valspar Announces New Trading Name for Distribution Company: Valspar Composites

FIBREGLASS MATERIAL SERVICES PTY LTD (FMS) will be known as of June 1, 2010 as Valspar Composites. Valspar, founded in 1806, is a brand name that has worldwide recognition. It is the fifth largest paint and chemical coatings manufacturer in the world.

Since 1980, FMS has been a well recognized name and supplier of all fibreglass materials in New South Wales. It became part of the Valspar family in 2001; later, in 2006, Polymer Daystar in Victoria also became part of the Valspar distribution network in Australia.

“The name change to Valspar Composites reflects the full integration of Valspar Australia’s polyester resin and gelcoat manufacturing business with the FMS and Polymer Daystar distribution network, and will create an Australian wide business with local inventories and an extensive range of products to provide everything, from start to finish, that an Australian Composites Manufacturer needs,” said Larry Nunes, Valspar’s Business Development Manager.

To find out more about Valspar Composites, visit www.valsparcomposites.com.au

Welcome New Members

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New Farecla Website

It is with great pleasure that we announce the launch of the new and improved Farecla website at www.farecla.com.

The main goal in developing this site was to create an online resource with which to share the latest company information and support materials with all of Farecla's international network of customers, both existing and potential.

It has been designed to be simple with an easy to use interface that will allow universal access to the wealth of new features that have been incorporated into the site. Key site features include:

- Video tutorials, product listings & information, latest news, market specific homepages, and contact us.

Farecla intend to continually improve, update and expand the site moving forward. Australian Warehouse Distributors are the Australian agents for Farecla.

More information can be obtained by calling (03) 9553 1977 or emailing info@storkawd.com.au. Links to the new Farecla website are available on www.storkawd.com.au.

Hutchins Anti Static Airline

As a result of the ever increasing demand for contaminant free substrates in the auto body paint booth, Hutchins Mfg Co have released their Anti Static Air Line.

Originally developed for the aerospace industry it reduces static electricity by improving metallic orientation for both solvent and water based paints during the painting process. The Hutchins Anti Static Air Line can also reduce static problems when used in conjunction with waterborne air diffusers and blowers whilst prepping body panels, plastic parts and bumpers.

The durable lightweight design of the airline with its large I.D. improves airflow for better gun and tool orientation while the opaque colour allows detection of any air contaminants such as oil or water. Available in 10 and 15 metre lengths they are fitted with ¼” BSP F/M couplings for hi-flow air with an operating pressure to 15.5 bar and are temperature resistant to 65°C.

For more information regarding the Hutchins Anti Static Air Line please contact Australian Warehouse Distributors on (03) 9553 1977 or email info@storkawd.com.au.

Composite Industry Insurance Specialists
Specific Industry Related Policies
David McAllister,
Greg McDonald,
Bruce Bailey.

Phone: 1300 85 35 88
Fax: 1300 85 39 33
www.verisure.com.au
LRTM Taking Off In India

MVP Conducts Successful Comprehensive Light RTM Training In India.

Kent, WA – Magnum Venus Plastech’s comprehensive three-day Light RTM training course has become one of the Composites Industry’s leading sources for manufacturers to learn how to bring LRTM to their production. Since its introduction two years ago, the MVP Light RTM training course has been conducted in multiple countries including Germany, Australia, South Africa, Spain, and now India.

India is proving to be a rising star in Composites production, and many companies there are moving quickly from "standard" spray up techniques into closed mould production. As they learn of the savings benefits in time, production costs, safety and more with making the change to Light RTM, Indian manufacturers have found the need to learn more about how to incorporate this process into their production.

Magnum Venus Plastech Distributor for India, MVP-India, hosted the MVP Light RTM training for the first time at their facility in Mumbai in January. The customers who attended this course were confident that they had successfully learned the techniques necessary to begin using LRTM in their production. Mr. Charles Tur, RTM/Infusion Technical Specialist for MVP, also met with several customers who had made the move into LRTM with the assistance of the technicians at MVP-India to speak with them on the latest technology and techniques being used in this process.

The purpose of this course, conducted by Mr. Charles Tur, is to provide customers, who are considering the move to closed mould technology, with the tools and training they need to make the changeover successful. To that end, the three day training course includes extensive classroom lectures on the technology and techniques behind the process, the real costs and benefits of using Light RTM, and then moves to hands-on training from tooling the mould and counter mould, and finishes with the injection of a finished part.

The full training course is set up to be a strong transfer of the technology of mould building, and allow each attendee to gain a good basis of knowledge to take back to their company, and easily put into practice. Each person who attends the course receives the comprehensive training course manual, which discusses in detail the practices they learn during the class, as well as other training materials to use as reference once they are back at work. With these tools, our attendees have the knowledge base they need to get their Light RTM operation up and running.

To learn more about the Light RTM Training, or any of the products offered by MVP, please visit the Web site at www.mvpind.com

Contact: Joan Tracy – Vice President, International Sales – (253) 854-2660

Cut Resistant Gloves

Australian Warehouse Distributors (AWD) has released cut/puncture resistant gloves.

The Trade Haus Sure Grip CR10 Gloves are made from high tech stretch/glass fibre lycra; with oil and chemical resistant nitrile coated palm fingers & thumb for better grip, dexterity and comfort.

With a cut resistant rating Level 4, AWD claim they are well suited for the body shop and metal fabrication environment reducing the risk of serious hand cuts which can also contribute to ligament damage and ongoing surgery.

For more Information regarding the Trade Haus Sure Grip CR10 Cut Resistant Gloves please contact Australian Warehouse Distributors on (03) 9553 1977, email info@storkawd.com.au or visit our website at www.storkawd.com.au
FGI Launches New Products at Boat Show

Every year for the past 9 years, Fiber Glass International (FGI) has displayed its range of products and services at the Sanctuary Cove International Boat Show.

Production and one-off project boat builders come from all parts of Australia and Asia to visit the FGI stand. This year’s show attracted over 40,000 visitors.

Michael Di Stasi, FGI Marketing Manager, said, ‘This year’s show exceeded all expectations, with a handful of project builders placing orders at the show and several good leads to follow up. “We were delighted to launch our new range of Divinycell PVC Core materials along with our new high HDT Vinyl Ester based tooling gelcoats.

“FGI continues to be the market leader in Infusion resins through our specially formulated Ultratec low shrink Vinyl Ester Infusion series. “We also released our new range of Marine grade Polyester Laminating resins which gives our customers the benefit of better laminate clarity, fast wet out and most importantly, superior cosmetics. “Award winning boat builder Cruise Craft have already implemented this new series into their production facility.”

For any queries on the above products or for a catalogue on the complete range of FGI products, please contact your local FGI office or visit www.fgi.com.au

Events Schedule

The following Composites Australia (CA) events are scheduled for 2010. Please contact Ann Byrne at the CA Secretariat for further details and registration. Don’t forget to check the website for regular updates: www.compositesaustralia.com.au/briefings.htm

**Friday 18th June**
9.00am – 3.00pm

**Industry Tour - Toowoomba**
A Day of Visiting Composites facilities in Toowoomba QLD
Includes the Centre of Excellence in Engineered Fibre Composites at USQ, LSM Advanced Composites, Buchanan Advanced Composites, LOC Composites & others. Bus transport & lunch included.

**Tuesday 22nd June**

**Joint Event with SPE A-NZ:**
Commercial Fibres Current Trends and Future Applications
A combined tour & seminar – hear what’s new and coming up in glass, carbon, and other fibres.

**Thursday 8th July**
5.00pm – 7.30pm

**Trade Night / Industry Briefing**
- The Use of Composites in the Construction of Flying Model Rockets – Tim Banicevich, Fiber Glass International
- Marketing Composites – Using Customer Profiling to Get Better Results by Approaching as Few Potential Customers as Possible – Mark Sterbic, DIAB Australia
- Emerging Applications and Opportunities for Biocomposites in Australia – Andrew Beehag, ACS-A

**Thursday 14th September**

**Trade Night & Demonstration**
Tour of Mine & Briefing
To Be Confirmed. Joint event with FSAA (the Filtration and Separation Association of Australasia

**Wednesday 6th October**
9.00am – 5.00pm

**Practical Workshop**
Closed Moulding Workshop – the lean mean (green!) machines!
Hands-on practical workshops. Limited to 25 participants.

**Wednesday 10th November**
9.00am – 5.00pm

**Practical Workshop**
Closed Moulding Workshop – the lean mean (green!) machines!
Hands-on practical workshops. Limited to 25 participants.

**Thursday 2nd December**
9.00am – 5.00pm
5.00pm – 8.30pm

**Practical Workshop – Closed Moulding Workshop plus Composites Australia AGM / Trade Night / Christmas Party**

**Wednesday 16th December**
9.00am – 5.00pm

**Practical Workshop – Closed Moulding Workshop**

**Thursday 17th December**
9.00am – 5.00pm

**Composites Australia AGM / Trade Night / Christmas Party**

This schedule is subject to availability of venues, speakers, resources and equipment and may change from time to time. Composites Australia is not liable for any loss or expenses incurred due to changes in the programme.