

# MEC brings boat builders and suppliers together

The Marine Engineering Conference (MEC) is an annual business-to-business event that brings boat builders together with suppliers of composite products and services. This year's symposium was held at the Quark Hotel Congress Centre in Milan in February. David Westaway tells us what happened.

The delegate list read like a 'Who's Who' of the Italian boat building fraternity with names like Azimut, Ferretti, Gobbi, Intermarine and Riva. Although it began life as a predominantly Italian congress, MEC is now taking on a more international dimension. The event was also particularly well supported by UK companies: Princess, Fairline, VT - Halmatic and Warrior all sent representatives, as did Rodman (Spain), Numarine (Turkey) and Karnic (Cyprus). Some 200 people attended in total, of which 25% were from non-Italian companies, which is 10% up on the 2004 figure.

MEC organiser Pier Luigi Curatalo welcomes greater international repre-

sentation but doesn't want to compromise the successful formula of the conference.

"Judging from the feedback we get, the balance we have between users and suppliers is just about right," he says. "We always aim for 10-12 leading materials and equipment manufacturers to show their latest innovations and technical capabilities directly to the decision makers. Our target group is always senior people like managing directors, production directors, engineering managers, purchasing managers or company owners. People come back each year because of the high quality seminars that are technical but also very practical. They also enjoy spending a couple

of days with an exclusive network of marine manufacturing sector professionals."

Of the 200 attendees, 80 were from the supply sector and 120 from the user sector, which broke down as 34 boat building companies, 22 mould manufacturers, six plug manufacturers and seven yacht designers and consultants. Some of the end-user delegates were invitees from the sponsoring supplier companies and constructors of special machining centres. These sponsoring companies included Chemtrend, DSM Composite Resins/Euroresins, Verind/ITW Binks, Cometi/Mecnan, ICR, DIAB, Aerovac, Delcam, CMS, Huntsman, Duratec and Persico. Euroresins UK brought along as



Azimut has embraced the vacuum infusion process.

its guests a large percentage of the UK contingent.

The conference kicked off with a presentation by the Nautical Division of the design and prototyping company Persico, which explained its competencies in this sector and the work it is doing in encouraging the adoption of advanced materials and new technologies. Persico works with boat builders and designers in all the development stages of the prototype: design engineering; plugs; pre-series mould tooling; and production mould tooling. Significantly Persico outlined how it is able to consistently reduce 'time to market' from design stage through plug and mould to initial production run.

Chem-Trend, part of the Freudenberg group, followed with a presentation on the application and advantages of semi-permanent release systems. According to the company, there is an increasing migration from solid waxes to semi-permanents for benefits that include extended mould life, greater resistance to solvents, styrene and exothermic reaction.

### **A large boatyard can lose 35-40 tonnes of styrene into the atmosphere each year.**

Styrene emission abatement is clearly an area where a close relationship between material supplier and processor is essential. It is an area in which DSM Composite Resins has been actively working with its customers on the development and application of low volatile organic compound (VOC) resin and gel-coat systems. A new polymer backbone has been designed by DSM that enables less styrene to be used in its low VOC gel-coat base resin formulations. Neogel ECO gel-coat was shown as an example of this technology, whereby overall styrene emissions are reduced by around 30% while physical properties such as

weatherability and osmosis resistance are improved. Shrinkage is lower, yield improved and there is less print-through. DSM pointed out that a large boatyard can lose between 35-40 tonnes of styrene into the atmosphere each year, making a compelling case for the wider adoption of low VOC systems.

Closed moulding is, of course, a major weapon in emission reduction and the UK company Composite Integration explained the benefits of, and its expertise in, the field of Light RTM (resin transfer moulding). Over the last year Composite Integration Ltd has worked closely with Sunseeker International Ltd to replace hand laminated parts with RTM Light version to minimise tooling costs and mould handling problems, while at the same time improving component quality. Many of the products use a foam sandwich construction and include cores and inserts to accept additional hardware. According to Composite Integration, RTM Light is particularly good at tolerating such complex structures with the minimum of tool complexity. The main advantage over hand lay-up is that RTM Light gives two cosmetically acceptable moulded surfaces without expensive and time-consuming re-work. This system therefore fits between traditional RTM and film vacuum infusion. Examples were also shown of large complex mouldings made by RTM Light that couldn't have been made by hand lamination.

Environmental technology was also the prominent theme of the presentation by machinery producers Verind, together with ITW Binks. According to Verind, resin spray-up accounts for 55% of styrene emission in an open moulding process, compared to 25% for laminating and 20% for static curing. The companies entered a project to reduce styrene emissions by 35% through a combination of strategies such as airless spraying, internal mixing, reduced application pressure and lower velocity from the nozzle.

ICR, an Italian producer of specialist putties, adhesives and surface coatings



*The Marine Engineering Conference.*

explained its development of a range of vinyl ester based putties for large boat hulls. Italy is the world's largest producer of superyachts and as boats get bigger and more powerful, greater stress is put on finishing materials. Interestingly, hull temperatures generated on a boat are considerably influenced by colour. During a hot sunny day a white hull may reach temperatures of 50-60°C, a blue hull rises to 80-85°C, while a black hull can reach a high of 95-100°C. Demand for better performance – like higher heat distortion temperature, chemical and mechanical property improvements – can be met by vinyl ester based putties used for bonding and surface repair applications.

Euroresins, the distribution arm of DSM Composite Resins, gave a paper on the factors affecting the surface profile of infused laminates. Resin shrinkage (typically 6-9% by volume) ultimately leads to non-uniform appearance – a problem that is compounded in the resin infusion process by the 'all at once' cure and the lower viscosity/higher shrinkage of the resin systems used. A suitable tie coat (typically a print blocking chopped strand mat layer based on vinyl ester resin behind the gel-coat) or a barrier coat (unreinforced layer within the



Delegates network during MEC.

structure) can help to minimise print-through. Best results are often achieved by using a combination of approaches. A vinyl ester urethane resin barrier coat has been proven to be very effective as it thickens and enhances the gel-coat as well as giving extra protection against blistering. Using a syntactic foam barrier coat is another route that has proved particularly successful against roving patterns.

Euroresins gave an overview of the influential factors and outlined DSM's use of high technology surface measurement by the Diffracto D Sight method, which allows boat builders to benchmark their systems and monitor the effects of improvement measures.

Continuing the theme of resin infusion came DIAB, with its Core Infusion Technology™, showing examples of how large hulls and decks are moulded by vacuum infusion. Core Infusion Technology uses an integral part of the sandwich composite – the core – as the transfer medium. This is achieved by machining the core surface to produce a series of carefully positioned grooves to facilitate resin distribution. As a result the need for a sacrificial distribution net or mat is completely eliminated, as is the requirement for peel ply and release film.

Azimut uses Core Infusion Technology for the hulls, decks and superstructures of its entire range of luxury motor cruisers. The company is understood to be the first major serial producer of luxury motor yachts to implement infusion on a full production basis. Good resin transfer properties of the core mean that large moulds – up to 60 ft long – can be infused using just three feeder lines, as well as thick layers of up to 1800 g. With the faster preparation and one-shot wetting of the reinforcement pack, DIAB claims that mould cycle time can be reduced by up to 50% for large hulls. The other benefits of resin infusion are well documented and include: near zero styrene emission; improved strength and stiffness at lower weight; improved quality control and product consistency; and a more attractive working environment.

For those interested in vacuum infusion, Aerovac supplies a complete range of ancillary products such as: nylon bagging film, sealant tapes, nonwoven polyester and nylon felts, extruded release films, peel plies, adhesive tapes and fabrics, as well as hoses, couplings release agents, knives etc. The company says it is the first composite supply specialist to offer a consignment stock service and described how it has developed patented re-usable technology for resin infusion, including re-usable membranes, manifolds and connectors. Aerovac can create an infusion network design based on drawings, mould geometry and laminate plan supplied by the customer.

The concluding session of the MEC concentrated on plug and mould making with presentations from Delcam, the largest developer of product design and manufacturing software in the UK, with subsidiaries in North America, Europe and Asia. Delcam's computer aided design/computer aided manufacturing (CAD/CAM) software has been developed over more than 30 years to give fast, efficient design, manufacture and inspection of all types of tooling. The company also offers a suite of

inspection software that can realise savings of up to 50% in some processes. CMS is an Italian producer of five-axis computer numerically controlled (CNC) milling machines. Its machines can be highly integrated with CAD/CAM software packages and are used for producing patterns and prototypes as well as for trimming and cutting composite components for the marine industry.

On the materials front, Huntsman, the company behind the Araldite brand, showed how its seamless modelling paste could reduce production time and increase the accuracy in plug and mould manufacture. Its latest epoxy paste has low reactivity, low shrinkage and a slow development of exotherm to ensure a smooth through-cure. The system is easily applied and void-free. Continuing the theme, Hawkeye Industries described its Duratec range of finishing system consisting of: polyester sealer, vinyl ester putty, base primer, surfacing primer and polyester high gloss coating. ■

*For more details on the MEC conference and the presentations e-mail pierluigi-curatolo@hotmail.com.*

*For more information on the technologies mentioned in this feature please visit the companies' websites:*

*Persico; www.persico.com*

*Chem-Trend; www.chemlease.com*

*DSM Composite Resins; www.dsmcompositeresins.com*

*Composite Integration Ltd; www.composite-integration.co.uk*

*Verind; www.verindspa.com*

*ITW Binks; www.binks.com*

*ICR; www.icrsprint.it*

*Euroresins; www.euroresins.com*

*DIAB; www.diabgroup.com*

*Aerovac; www.aerovac.com*

*Delcam; www.delcam.com*

*CMS; www.cms.it*

*Huntsman; www.huntsman.com*

*Hawkeye Industries; www.duratec1.com*