GLOBAL SOLUTIONS

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MARINE

Pogo 6.50 boats are in a class of their own

Located in south Finistere, close to Quimper on the north west coast of France, Chantier Naval Structures (normally shortened to 'Structures') are the builders of Pogo sailing boats.

The Pogo 6.50 was first built ten years ago and in every year since, it has been a Pogo 6.50 that has won the prestigious Mini Transat – the smallest trans-Atlantic Open Class yacht race. None of the entrant boats can be more than 6.6metres (21 feet) and each is sailed solo. Often up to 70 boats compete making it the largest fleet of offshore racing yachts. Two years ago the Pogo II was introduced to critical acclaim.

Christian Bouroullec, the founder of the Pogo shipyard also recently introduced two new race cruiser boats: the Pogo 8.50 and, this year, the Pogo 40.

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The new Pogo 40

Composite Integration and Euroresins cooperate to promote RTM Lite

Where a good gel coat finish is needed on both faces of a component (like hatches), or where tight engineering tolerances are needed to ensure a good fit - RTM Lite can provide an excellent solution.

In RTM Lite, female moulds of similar strength and stiffness to those for HLU are simply modified with a special flange design to enable clamping and resin / vacuum distribution. A semi-flexible male mould (often transparent) completes the pair. To avoid start-up pitfalls which can lead to a long and costly learning curve, DSM / Euroresins and RTM Lite experts Composite Integration Ltd from Cornwall, UK have teamed up to host mould making and technology courses at DSM's technical facility in Zwolle (Netherlands).

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Meeting Industry needs through innovation

The combined experience and competencies of DSM Composite Resins and our dedicated distributors enables us to offer our customers solutions that are precisely tailored to your needs. We are committed to delivering value: helping customers with quality issues; improving yield and productivity; and actively supporting compliance programmes. Our customers also look to us for innovations in product development. This issue of our newsletter clearly illustrates our commitment to innovation and is full of new developments that underscore our expertise in vinyl ester technology: VE gelcoats, VE rapid tooling resins and VE structural bonding paste. The industry demands higher performance materials and we deliver.

Mel Foster
Business Manager Marine

Pogo 6.50 boats in a class of their own (continued from front page)

The goal was to design a boat capable of achieving a compromise between fast racing and long distance cruising. Structures decided that a 40 foot (12.20 m) boat was the ideal length. These boats are technically advanced and use Atlac 580 ACT vinyl ester resin as a tie-coat to improve physical and mechanical performance.

Two years ago Structures began a close technical collaboration together with DSM Composite Resins and the University of Saint Brieuc, to look into the introduction of an infusion process that would achieve best performance in terms of surface quality and laminate integrity, and would also minimise weight.

Today, most of the company's production is now made using an infusion process utilising Synolite 8488 G 1 for best performance. DSM continues to work closely with Chantier Naval Structures to improve quality throughout their production processes.

Stephen Leonard-Williams & Richard Bland

Large rotating hatch for Sunseeker

Composite Integration specialists in RTM Lite

Formed by Directors Stephen Leonard Williams and Richard Bland, Composite Integration Ltd brings a practical hands-on approach, backed by sound technical knowledge and experience. The company assists customers throughout the closed-mould process; from product design optimisation, materials selection, tooling design, tooling manufacture (composite and metal), equipment, accessories and installation, through to monitoring and process control. Quality operator training is essential and the company provides on-site and in-house training to suit individual client needs.

SOLUTIONS IN VACUUM RTM

Composite Integration has worked in the marine, automotive, aerospace, defence and other industries on projects ranging from tool manufacture through to complete turnkey automated moulding cells. The company has also introduced a range of market leading ancillary equipment. Composite Integration has worked with several of the major marine manufacturers to help implement closed mould systems. Sunseeker International Ltd (UK), for example, wanted to use vacuum RTM for some of its smaller complex parts, starting with a range of composite hatches. Composite Integration worked with Sunseeker to modify designs, develop patterns and build production moulds.Training ranged from general use of production equipment and materials, up to full mould-building to enable further tooling to be produced in-house. Producing the hatches formed the core of the new Vacuum RTM production cell and enabled the technicians to become familiar with the process and confident in its wider application. Over the past year Sunseeker has successfully manufactured some highly complex structural components, including a 4.5m diameter rotating roof hatch for the new Predator 82. Fibre content and orientation around the structural core varies according to the specific strength requirements, and ranges from a standard combination mat in the less stressed areas to unidirectional carbon and glass in the main cross beams. Various metal inserts were also required within the laminate and the completed structure had to fit within a precise target weight. Co-operation between product designers, material suppliers, process specialists and the manufacturing team helped ensure a successful outcome in the shortest timeframe.

Contact your local DSM / Euroresins sales department for further information on training workshops.

Windy Boats chooses top vinyl esters for infusion

Top quality is a driving force at Windy Boats AS. Since 1966, when the company was established in Norway, every new model has been developed choosing advanced tools for design, specifying high quality materials and employing highly skilled craftsmen for manufacturing.

So when Windy Boats decided to produce their next 52' series using vacuum infusion at their facilities in Sweden, they looked for partners who could provide high level technical assistance to inject the first hull.

The transfer of the infusion technology was carried out by DIAB, the main core supplier in Scandinavia, while the resins for the tie coat layer and the infusion were supplied by DSM Composite Resins and Euroresins.

DSM Composite resins was recommended as a materials partner for this project because of its expertise in infusion, the willingness and flexibility of the Expertise Center to provide materials and support, and for the high quality of the resins produced by the company.

Windy 58 Zephyros

LAMINATE COMPOSITION

In the processing of this particular 52-foot hull, a high quality tie coat was applied behind the gelcoat, using two layers of CSM and Atlac 580 ACT. A pre-accelerated, thixotropic vinyl ester-urethane resin, Atlac 580 ACT provides excellent osmosis resistance and very low shrinkage. The structural lay-up consisted of a glass/PVC foam package designed to ease the resin flow. Atlac 580 AC 200 (vinyl ester-urethane) was used as the infusion resin to ensure good wetting of the reinforcements, very good osmosis resistance and low shrinkage. By using this high performance resin, a good cure was achieved in thin layers, with a peak exotherm which did not exceed 70°C in the keel.

Windy Boats infuse a 52 foot hull

The first infusion of the 52-feet hull was successfully carried out in less than two hours and resulted in a very attractive, high quality surface finish. See back page for details of our new Infusion brochure.

New brush-grade VE tooling gelcoat

Neogel VE 8394 produces high gloss moulds with high durability

In the previous Global Solutions Marine we introduced Neogel VE 8393 series gelcoats for spray application. To complete the range of products for mould making, we are now pleased to announce the availibility of the Neogel VE 8394 series - brushable gelcoats designed to have all the required properties of a vinyl ester tooling gelcoat.

EXCELLENT PHYSICAL PROPERTIES AND HANDLING

Like the spray version, this gelcoat is cured with standard MEKP, so no special peroxide types are needed. The layer thickness can be easily controlled. The thixotropy behaviour of this VE Tooling Gelcoat benefits from the unique Atlac E-Nova technology, with thixotropy recovery characteristics like a normal gelcoat. Excellent levelling properties level out brush stroke marks, while the air release properties result in a finished mould surface that is perfectly glossy and which has excellent durability. This gelcoat is available in four colours pigmented via the Eurotinter system (black, light green, grey and orange).

AQUAFIBRE MOULDING SELECT NEOGEL VE 8393 SPRAY SERIES AS THEIR PREMIUM GELCOAT

Aquafibre Moulding Ltd is a UK company specialising in mould making technology. The company produces high quality superstructures (hulls and decks) for well known boat builders in Britain. To strengthen its reputation, Aquafibre is continually looking for improvements in the quality of the moulds they produce, and were therefore keen to test Neogel VE 8393 spray series. The trial took place on the plug of a 36 ft boat hull using Neogel VE 8393-W-9617 (light green). The gelcoat was processed using airless spray equipment with internal mixing set at 2% by volume standard MEKP. Spraying with nozzle 18/50 (18 thousand of an inch under an angle of 50 degrees) ensured perfect control of the layer thickness build of the gelcoat.

The gelcoat was applied in three passes of

Excellent levelling properties level out brushmarks

Neogel VE 8394 colours

approximately 200 microns. Air pressure during spraying was 3 Bar, this rather low spraying pressure resulted in perfect air release conditions and low styrene emissions: important environmental and health considerations. The total processing time was three hours (90 minutes for each side of the hull) and resulted in an accurately controlled gelcoat layer, that ensured the perfect mould surface.

After carefully applying the back-up laminate, the mould was released from the plug. Experts at Aquafibre were pleasantly surprised by the very high gloss of the surface. The resulting mould was perfectly homogeneous (no fading), and didn't suffer from microporosity, which is often a weak point of regular VE tooling gelcoats. As Robin Woods from Aquafibre commented: “It is an excellent gelcoat with a very good surface quality. We already made two mouldings from this mould and the gloss retention is remarkably good. No repair work or polishing was needed so there was no delay in re-using this high quality mould. We will definitely move forward with the wider use of this gelcoat”.

FULL PACKAGE MOULD MAKING SYSTEMS NOW AVAILABLE

Within DSM Composite Resins, innovation is a key success factor. This is why we developed the next generation of Rapid Tooling Systems. These latest innovations enable us to provide customers with a full system solution for producing high gloss, high quality production moulds that are extremely durable and which significantly reduce the total production time of the mould. The state of the art mould making package consists of the Neogel VE series (including 8393 - spray and 8394 - brush) and Neomould 1982-W-1.

Neomould 1982-W-1 is a Low VOC fast curing tooling resin with zero shrinkage. It is designed to cure with standard MEKP, resulting into a tack-free surface. Moreover, the lower density compared to other systems allows a saving of up to 10% in the weight of the mould. The resin is designed for ease of use: rapid fibre wet-out, no dragging on the roller and colour change indicator when peroxide is mixed in. The dark colour of the resin makes it easy to identify any air pockets during laminating -especially important for the first layer behind the gelcoat. Well balanced thixotropy properties allow the resin to be used by hand lay-up or spray-up with no slipping or drainage occuring on vertical surfaces.

European training seminar

The sales teams of Euroresins and selected partners recently met for hands-on training in the Neomould rapid tooling system, and to update on the latest in infusion technology:specifically for the marine industry. After practical sessions with Neomould, the full DSM infusion resin range was reviewed and contrasted, with live demonstrations of both core and monolithic infusion. The seminar was supported by guest speaker Andreas Forsberg, of Diab AB of Sweden, who offered practical advice on the core infusion method. DSM's partner in gel coats, Büfa GMBH of Germany, was represented by Dirk Punke who updated the group on the latest developments in gel coat technology. The sales teams presented the developments and trends they see in the European marine sector, which will help set future development programmes.

Gelcoat spraying at Aquafibre

Neomould: latest generation MEKP cure rapid tooling system

Over recent years, rapid mould making techniques have been broadly adopted in the marine industry composites sector. The driving force behind this has been demand from boat buyers for improved surface finish (especially for dark colours which are less forgiving), and the continued high level growth in the sector which increases the need for the rapid introduction of new models. DSM has recently launched its latest generation rapid tooling system under the name of Neomould ™.

RTS brochure and distinctive silver Neomould pail

SIMPLICITY AND COST CONTROL

The system, comprises the latest technology in vinyl ester gel coats and zero-shrink structural laminating resin. It is designed to produce moulds with outstanding surface quality and durability, combined with rapid production and ease of release from the plug. The latest advance enables the use of standard MEKP catalyst with both gel coats and laminating resin for simplicity and cost control in the marine workshop.

The latest generation VE tooling gel coats Neogel VE 8393 (spray) / 8394 (brush) series offer good air release and anti-sagging properties. Unlike many vinyl ester products, they do not generate bubbles when MEKP catalyst is added – thereby minimising the prospect of trapped air in the mould surface – requiring re-work. The cured gel coat films show high levels of heat and styrene resistance, good scratch resistance and high Barcol hardness, as well as excellent resistance to brush marking / water marking in service. In line with DSM's policy of developing products compliant with styrene content directives in certain areas of Europe, the Neomould 1982-W-1 laminating resin has been developed to contain a lower level of styrene – and as such is classified as "low VOC". The zero shrink laminating resin is pre-filled and pre-accelerated, needing only the addition of standard MEKP to start the curing process. The resin is formulated with a long (45 minutes) gel time in warm conditions to allow for the practical construction of large moulds, and a reduced density compared to other systems makes lighter moulds that are easier to move around the workshop.

Fast tooling is essential for modern boatbuilders

The fine filler system enables good wet out, minimal settlement and reduced down-time for spray equipment. Three gel coat / skin coat / lay-up structures are proposed in order to cover most mould making requirements. For full details contact your local DSM / Euroresins sales office.

Vinyl ester structural bonding paste for Hallberg-Rassy

World famous Swedish shipyard Hallberg-Rassy Varvs AB is renowned for the sturdy construction and superb craftsmenship of its sailing vessels ranging in size from 31 foot to 62 foot. All Hallberg-Rassy (HR) sailing boats are constructed to withstand the heaviest and most extreme weather conditions, which is why many round-the-world yachtsmen and women have chosen HR Yachts for their non-compromised quality and reliability.

Not surprisingly HR have adopted a philosophy of only using the best components and materials. But before deciding to use a new material they need to satisfy themselves of its quality by running their own extensive test series. Recently the company decided to evaluate the suitability of Oldopal VE Bonding Paste 0110 for the structural bonding of engine foundations and for the grit system that reinforces the hull construction below the water line. At Kungshamn on the west coast of Sweden, Hallberg-Rassy Marinplast AB manufacture and assemble the hulls, decks and other component parts.

"APPROVED FOR EXTREME WINDMILL STRUCTURAL ADHESIVE BONDING DOES NOT AUTOMATICALLY MEAN THAT IT IS APPROVED BY HALLBERG-RASSY FOR MARINE APPLICATIONS….."

VE bonding paste with grit

Although Oldopal VE Bonding Paste 0110 was originally developed for the highly demanding windmill industry and has proven to withstand the intense mechanical forces in extreme weather conditions, this did not automatically qualify the adhesive for the applications that HR had in mind.

After lengthy considerations over the properties and advantages of using Oldopal VE Bonding Paste 0110 for their structural adhesive bonding, HR began a series of tests to determine whether this toughened VE-based adhesive could fulfil their high quality demands. Only after numerous, exacting tests had been completed were HR satisfied that this material fully met their requirements in every respect.

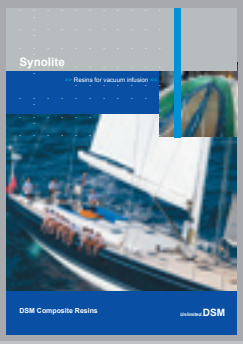
"We have not only looked at the pure mechanical performance and behavior under extreme conditions, but we also took into account environmental and processing issues", said Mr Thomas Karlsson responsible for production at Hallberg-Rassy. "What we especially like about this bonding paste is that it enables us to use standard MEKP instead of the typical toxic peroxides that are usually needed to cure vinyl ester based products. Nowadays these peroxides need to be labelled with a skull and crossbones. Our operators also really like the ease of applying the paste and the good workable consistency. There may be somewhat cheaper adhesives on the market but they don't offer so many positive properties. At HR we always go for the best".

OLDOPAL VE BONDING PASTE 0110

Originally developed for the windmill blade industry with all its extremes, this structural bonding paste is also highly suited to marine applications. It retains its own integrity and bonding strength over long term exposure, across a wide variety of substrates and regardless of exposure to water, other aggressive media, heat or very low temperatures and changing mechanical loads. For machine-operated dosing systems an alternative thixotropation system was developed enabling large volume application. Although it is easy to pump large volumes quickly, the adhesive does not sag when applied in 20 mm thick vertical layers. Curing is initiated using standard MEKP and application of layers from mere microns up to 30 mm is problem-free.

HR boats use only the best materials

News



New brochure on resins for vacuum infusion

Increasing numbers of key manufacturers are adopting or investigating infusion based programmes; focusing on performance, productivity, environment and cost benefits. To ensure that the correct resin systems are used, our new brochure, currently being prepared, will describe the benefits of the principal resin types and the selection criteria, including curing systems.

Versatile Atlac E-Nova proves ideal for fuel storage

The specially developed low styrene vinyl ester skin coat (tie coat) resin, Atlac E-Nova MA 6325, also demonstrates excellent fuel resistance.

Boatbuilders are increasingly adopting a more industrialised approach to manufacture. Lean manufacturing principals are being applied – one of which is to rationalise, wherever possible, the number of different materials used in the process, in favour of multi-purpose solutions. In this way complexity in ordering and stockholding can be reduced as can shelf life issues. This approach also frees up more space in the material store or workshop.The development, by DSM Composite Resins, of an environmentally compliant skin coat resin which can also be used for gasoline (diesel) fuel storage applications is therefore excellent news for the marine industry.

Atlac E-Nova MA 6325 was primarily developed as a VOC compliant skin coat resin (less than 34% styrene content), but the latest tests have revealed that there is more to this versatile resin than just its excellent resistance to osmotic blistering.

Recently a study was made to assess the resistance of Atlac E-Nova MA 6325 to gasoline. Tests were carried out according DIN 53395 (single side exposure test – vapour and liquid) and ASTM C 581 (double sided exposure test) in diesel fuel at 50°C for 1000 hours. The result confirmed that Atlac E-Nova MA 6325 showed good resistance to gasoline. Retention of flexural properties exceeded accepted limits for corrosion applications and, after exposure, the surfaces did not show any cracks, blisters or other visible changes in appearance. The requirements of EN 977 have therefore been successfully passed. This means that Atlac E-Nova MA 6325 not only makes an excellent tie-coat barrier resin, but it can also be used, with confidence, in the production of gasoline storage tanks.

EVENTS CALENDAR

GENOA BOAT SHOW	Genoa, Italy: October 8-16	www.ifbso.com
IBEX	Miami, USA: October 19 - 21	www.ibexshow.com
SALON NAUTICO	Barcelona, Spain: October 22-30	www.salonnautico.com
HANSEBOOT	Hamburg, Germany: October 29 - November 6	www.hanseboot.com
METS 2005	Amsterdam, Holland: November 15-17	www.metstrade.com
SALON NAUTIQUE	Paris, France, December 2-12	www.passportnautic.com

Headquarters
DSM Composite Resins AG
Stettemerstrasse 28
P.O. Box 12 27
CH - 8207 Schaffhausen
Switzerland
Phone +41 (0) 52 644 12 12
Fax +41 (0) 52 644 12 00

Customer Competence Center
DSM Composite Resins France S.A.
Avenue de Vermandois
F - 60200 Compiègne
France
Phone +33 (0) 344 40 75 68
Fax +33 (0) 344 40 75 78

Euroresins Sales Office
Belgium and Luxemburg
Phone +32 14 699 042

The Netherlands
Phone +31 495 584 910

France
Phone +33 1 4102 04 90

Italy
Phone +39 0233 207 11

Norway
Phone +47 6751 6170

Sweden
Phone +46 418 566 90

Spain
Phone +34 93 588 6801

United Kingdom
Phone +44 151 348 8800

www.dsmcompositeresins.com
www.euroresins.com