

## Regatta racing at the highest level

YSA Yacht Design & Building introduces the new Competition Cat 30 catamaran developed with vacuum infusion resins.



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**Y**SA Yacht Design & Building, Wasserburg, Germany has always had the ambition to design and build the fastest and most exciting yachts for regatta racing. Following on from the YSA 10 launched three years ago as the prelude to a series of innovative racing yachts, the YSA Competition Cat 30 catamaran has now been introduced.



The Cat 30 carbon fibre catamaran

YSA boats are characterised by the most modern engineering, latest technology and their lightweight build, as shown by the recent design and development of the 9-metre-long Competition Cat 30 catamaran for regatta racing at the highest level. Its complete carbon look and intentional minimalist design are state of the art and uncompromisingly follow the standards and regulations of the sport.

For the construction of this lightweight catamaran, weighing

only 400-450 kg, YSA's CEO Sven Akermann and his team focused primarily on the materials and know-how from ebalta. In addition to the low weight requirement, the Cat 30 catamaran also had to feature a perfect quality CFRP laminate surface and high strength coupled with durability for a long life cycle.



Epoxy mould produced using the vacuum infusion method

For ebalta's composite specialists who cooperated on this project, it was immediately obvious that the requirements would be best achieved with the modern vacuum infusion manufacturing method. The infusion material used was the GL-(German Lloyd) approved epoxy resin BIV 800 which, compared with traditional polyester materials, achieved a lower weight coupled with considerably reduced odour during manufacture.

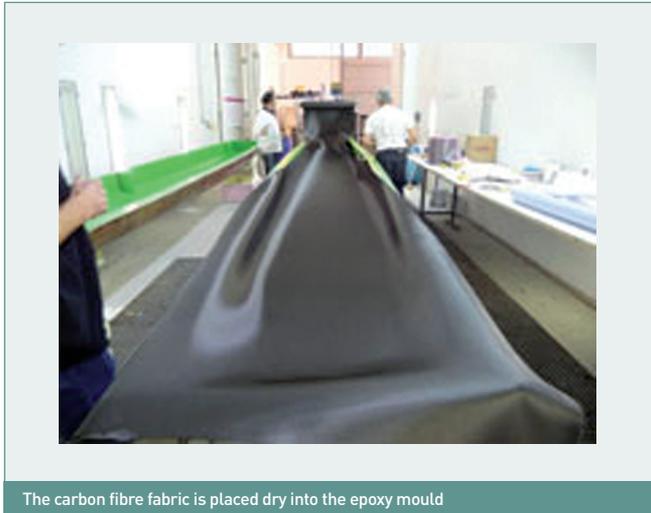
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ebalta, a recognized market leader in the field of model and tool making, has specialized in the manufacture and supply of tooling materials since 1974. The range covers polyurethane and epoxy resin systems and boards.

The main advantage of the vacuum infusion procedure is that a lower volume of resin gets drawn into the fibre material, thereby achieving a higher fibre percentage compared with hand lamination, and thus resulting in a higher strength-to-weight ratio for the part.

### Step by step to the part

The epoxy mould was produced from ebalta's AH 140 resin with hardener TC 90, also using the vacuum infusion process. To produce the CFRP parts, the carbon fibre fabric was placed in the mould in a dry condition. A peel ply layer was then inserted, followed by a perforated release film. The flow medium was then placed in position and fixed. The resin feed and vacuum hoses were attached and secured with adhesive tape. The flow medium and hoses were easily removed through the perforated release film after curing of the resin.



The carbon fibre fabric is placed dry into the epoxy mould

After applying the vacuum film, the structure was tested for leaks and the BIV 800 epoxy resin was drawn in through the resin feed hoses and distributed over the entire component. The infusion procedure takes no more than 60 minutes for each part, so YSA Yacht Design achieved considerable time

savings compared with the conventional hand lamination method, while producing lighter parts of the same strength. This resulted in an extremely light catamaran with a perfect carbon fibre surface.

### Process advantages

The vacuum infusion method also brings further advantages because it provides improved, consistent quality for all parts, so that uniform impregnation can be achieved without pinholes.

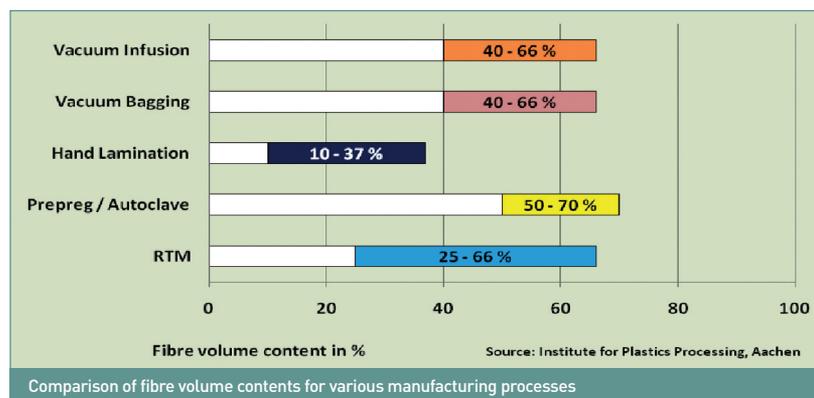
The infused resin content varies by less than 0.5% across the component, which means there is virtually no thickness change. The carbon fabrics can be positioned without any time constraints, and there are no pot life restrictions. Moreover, a faster demoulding time is possible through the use of resins with a short pot life. Such time savings are most notable for larger parts using a core material.



The epoxy infusion resin BIV 800 is pulled in and distributed across the entire component

The fact that the carbon fibre is applied dry results in clean working conditions, with significantly reduced emissions. Compared with hand lamination using vacuum bagging, further advantages include a lower resin content in the parts and a lower resin volume requirement for larger parts.

Vacuum infusion also has advantages over prepreg/autoclave processes: there is no need to purchase an autoclave and thick laminates are made in one working step, so no debulking is necessary. Compared with Resin Transfer Moulding (RTM), the advantages lie in lower tool costs. In addition, there is no need for an expensive injection system. For lot sizes under 100 parts, the vacuum infusion process proves to be far more economical. The success of the YSA Competition Cat 30 demonstrates the interest of the vacuum infusion process. ■



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