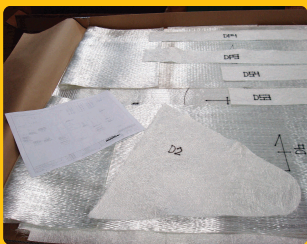
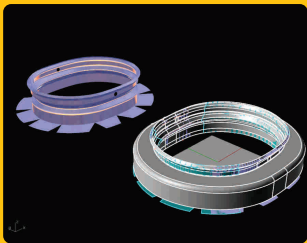




Easier. More cost-effective. Assured quality. Laminating your IPS drive system with a B³ SmartPac



SP-High Modulus, the marine business of Gurit, and Volvo Penta collaborate to offer boatbuilders a solution to the time consuming and labour intensive lamination process of installing the IPS 1 drive system into a moulded fibreglass boat, resulting in:

- Controlled, fixed cost of materials
- Reduced labour and faster cycle time
- Assurance the Volvo Penta specification is met

The installation of the IPS 1 drive system into a moulded fibreglass boat can be a critical step in the production process. The number of layers required to create the build-up, the complexity of the geometry, and the importance of ensuring the specification is adhered to, can result in this becoming the laminating task which constrains production throughput, as a consequence adding to the cost by more than the direct labour, due to reduced mould utilisation.

SP-High Modulus is working with Volvo Penta to continue to improve the efficiency of their customers' design and laminating process, with a view to minimising the cost to the builder, while ensuring the structural requirements and highest quality standards are met.

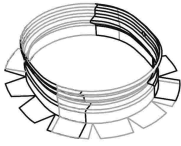
How are we doing it?

SP-High Modulus is offering two versions of the IPS 1 solution - one suitable for hand-laying and one suitable for infusion. They both follow Volvo Penta's approved laminate schedule, and are provided in a B³ SmartPac format.

The B³ SmartPac is a set of pre-cut pieces of reinforcement and core materials, all ready to laminate. It is a comprehensive package, including all the composite materials (except resin and fillers) required to install a dual drive system in a vessel up to 50' (15.2m) long. This will enable the builder to fabricate the 0.8" (2cm) laminate onto the Volvo ring plug, the foam collar and cover laminates, the foam formers and cover laminates for the transverse frames to the hull sides, the frame between the two drives, and the fore and aft frames to the transom. (Note: It does not include the materials for the girders forward of the IPS drives).

In total there are over two hundred individual pieces of reinforcement and over a dozen shaped foam formers! Each piece is cut to shape, and marked for alignment in the tool and with respect to adjacent pieces.

The pieces are referenced by a detailed plan, including 3D perspectives where appropriate, to ensure they can be quickly and accurately installed in the mould. All the foam core formers for the collar are machined to shape, with appropriate radii, and will fit with minimum filler resin around the ring. Sections for the stiffeners are supplied over length, and will be trimmed in situ to suit the specific geometry of the boat.

3 of 11	<p>LAYER C XE600.225CSM</p> <p>LAYER D & E 2X BE800.225CSM</p>	 <p>FULL COVER</p>	<p>DRAWING: 103</p> <p>ALIGN MATERIAL TO GEOMETRY.</p> <p>LAPS: XE LAP ONTO HULL SHELL 140 BE LAP ONTO HULL SHELL 180, 200 SIDE LAP MIN 50</p> <p>ALIGN FIRST PIECE TO THE MARK ON PREVIOUS LAYER</p> <p>CUT OFF EXCESS LAP ON LAST PIECE OF THE LAYER</p> <p>CURE.</p>
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Sample instruction from the B³ SmartPac manual

The B³ SmartPac has the following benefits:

- Removes the need for the builder to source and stock multiple reinforcement styles and core materials in order to comply with the Volvo Penta specification, **so reducing procurement and inventory costs**
- **Minimises material usage, waste and potential 'over build'** through the supply of CNC cut pieces, with specific locator marks
- Fixes the cost of materials, **eliminating the risk of cost overruns**
- Ensures the materials are located in the correct sequence, orientation, and position in accordance with the plans, **improving build quality**
- Enables the use of a mixed skilled workforce **requiring less direct supervision**
- **Offers reassurance that the component is built to specification** through the accurately cut materials and clear step-by-step instructions
- Eliminates the need for the builder to cut to shape and taper core pieces, **reducing preparation labour costs**
- Accelerates the laminating process through clear instructions and no need to trim to fit, **reducing laminating labour costs, and increasing production rate**

SP-High Modulus has selected a range of reinforcements which are ideally suited to the chosen process, whether hand-laid or infused. For the hand-laid version, the sequence has been carefully thought through to minimise the number of stages and plies, while also appreciating the need for drapeability, and the issues associated with application of too many plies in one operation. Exotherm and issues of shrinkage are reduced with no more than four plies of mat-backed 24oz (680g) reinforcement applied at one time. The infusion version is driven by flow rates and drapeability, resulting in a different laminate sequence.

The size and shape of each piece, and the staggering of plies have been considered, in order to ensure no regions are overly thick due to unexpected overlaps, nor are there "gaps" as the extent of the laps onto the shell increases.

The result is a tidy, uniform, finished laminate, meeting the Volvo Penta requirements, and yet practical and easy to accommodate in a shop floor situation.

Alternative arrangements and geometry can be quoted individually for different sized boats, or where additional drives are located. If volume warrants, the B³ SmartPac can be extended to cover the longitudinal engine bed girders which typically need to be specifically designed to suit the vessel.



Coming soon: B³ SmartPac for the IPS 2 drive system.

Please send us your contact details if you are interested in receiving updates about this particular solution.

Contact us now for more information:

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