

DECK HATCH REINFORCEMENT

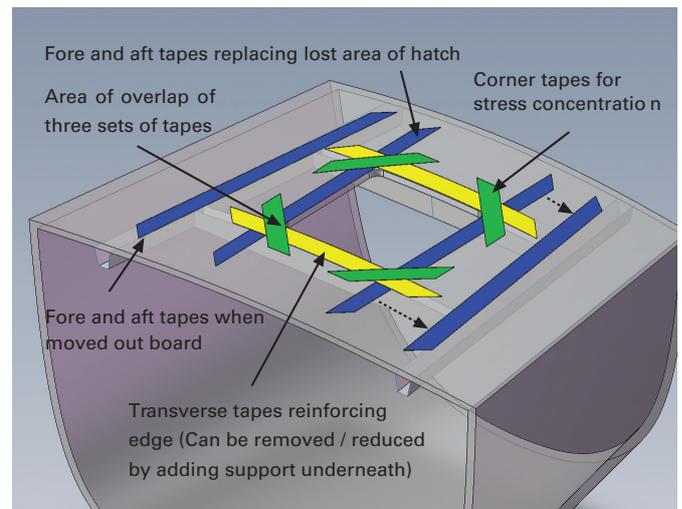
Deck laminate drawings often look complicated, with numerous tapes and patches fitted around load points and hatches. The bumps caused by overlaps of tapes can make fitting of the core more difficult for the builder. It's therefore not surprising Gurit engineers have been asked why we still insist on the need for such tapes around deck hatches. Is there a simpler option?

The fact of the matter is that tapes help us effectively counter an age-old problem that unchecked can threaten the structural integrity of a boat.

If we consider the whole hull and deck as a long beam being pushed down by the mast and pulled up at the ends by the runners/backstay and the forestay, the bending caused by such loads creates tension in the hull bottom and compression in the deck. The fore & aft stress that a deck has to take can be defined simplistically by dividing the force by the cross-section area of the deck.

If we now introduce a foredeck hatch on centreline, the deck cross-section area locally has reduced and so the stress has increased. As there can be no load through the hatch, the load has to find a way around it, meaning regions just fore and aft carry little load, creating a "shadow" which is largely unloaded. A wood knot is a great example to illustrate this process: the organic fibres bypass their way around the 'hole' of the wood and the 'shadow' created is similar to that we find around hatches.

Peak stresses are experienced at the corner of the hatch due to both the reduction of local area and a stress concentration caused by the stiffness discontinuity. The solution to this is the application of edge and corner tapes to help dissipate these stresses.



Hatch reinforcement tapes

So can we reinforce the hatch edge by making a strong hatch gutter? At first, this appears the attractive option, both practically and aesthetically. However, load travels down the stiffest path, not the strongest. By making the hatch edge really strong, it is also becoming stiff, thereby attracting more load. If this increased localised load is applied to the same basic laminate, the result is that the basic deck laminate may be overloaded.

Studies have shown that having one set of tapes without the other does not cure the problem. However, depending on the particular arrangement the practical problems caused by the overlap of edge tapes and corner tapes can be lessened by separating them. While the corner tapes must remain at the corners, longitudinal tapes can be moved away to limit overlaps - the best solution we have to ensure all-round safety.

For more information please e-mail contact@gurit.com