

The birth of a new boat



The story so far...

Tooling up for the new Cornish Crabber 26 began in September 2009. First came the hull plug, which was finished in mid-December. Then the hull mould was laid up over the plug and lifted off just after Christmas. A hull was constructed in the mould, starting in January, and remained in place while the interior plug and mould were built inside it.

While the hull was being laid up, the deck plug was built on top of the hull plug. It was finished in the middle of April, whereupon the mould was constructed.

Read parts 1-5 of the series FREE on the PBO website www.pbo.co.uk



Putting it all together

With all the tooling completed and the first hull moulded, it's time to start building the first of the new Cornish Crabber 26s. David Harding watches boat No1 taking shape in the factory in Cornwall

As with so many jobs, the bulk of the work when it comes to building a production yacht is in the preparation. It took Cornish Crabbers more than eight months to create the plugs and moulds for the new Crabber 26 but, as we saw in last month's PBO, they were finally able to release the first hull from its mould.

That marked a significant step: it was the first time since the inception of the project last summer that the final form of the boat had been seen in the flesh – or, more accurately, in mat and resin.

Since the moulds for the deck and interior had also been completed, Crabbers were finally ready to move on from tooling to building: to doing for the first time what they aim to be doing dozens and perhaps hundreds of times in the future.

Many of the processes during the build

take place simultaneously. The order in which each is described here doesn't necessarily correspond exactly to Crabbers' production schedule, any more than the order for the first boat will be the same as for subsequent production boats, though some jobs clearly have to be completed before others can be started.

The deck

The deck was laid up with a balsa core inside the horizontal surfaces of the glassfibre laminate to add stiffness, except where deck hardware is fitted. Plywood was used here because the hardware will be bolted through it. Many builders fasten the hardware by tapping machine screws into aluminium plates in the deck, but that can present problems when the aluminium reacts with the stainless fastenings. If removable headlining panels allow access



A WEIGHTING GAME The sections of balsa and plywood that will be laminated into the deck moulding are weighed down. Plywood is used where hardware is to be fitted; elsewhere it's balsa

The deck



RELEASED AND READY The deck moulding released from the mould and sitting on its dolly

IS IT GOING TO FIT? The deck is lowered on to the hull for the very first time in a (successful) test-fit. It's then taken off again, ready for the rest of the fit-out



What's it like inside? Big and empty – and there's plenty of headroom



The port holes are suspended with masking tape until their exact positions have been determined. Then it's time to fit them and the rest of the hardware including the stanchion bases. Note the self-adhesive paper applied to the deck and coachroof to protect the gel coat during the fit-out

to the underneath of the deck and coachroof, through-bolting is generally the preferred approach.

Once released from the mould, the deck was lowered on to the hull for a test-fit. Because the deck's plug was constructed on top of the hull plug, the deck's mould and therefore the deck moulding itself should be a perfect fit – and it was.

Then it was time to start fitting out the deck. The mainsheet traveller and the teak strake along the coachroof sides could only go in predetermined places, but the exact position of the portholes was decided by experimentation before any holes were cut. Then they were fitted, followed by the stanchion bases and genoa tracks.

The ballast

As we explained in the August issue, the ballast has to be fitted to the 26 before the interior moulding goes in. That's because it's in the form of lead castings inside the keel: one each side of the centreplate case and one forward of it.



Inside the deck moulding, the plywood and balsa can be seen through the inner laminates. The dark areas are where filler has been applied to ensure an even thickness



Hardware is bolted through the deck: a stanchion base in the foreground, and the track for the yankee

The ballast



1 The lead ballast castings either side of the centreplate case are already in place. Now more resin is poured into the keel ready for the forward casting. Here we're looking aft.



2 The 582kg (1,283lb) third casting is lowered in...



3 ... and settled into position on top of the resin.



4 More resin is poured on top to fill any gaps between the hull moulding and the lead.



5 The resin is brought up to a level where it will be just below the cabin sole. It also fills the bilge keels, making them solid and thus stronger.



6 Now the resin and ballast are glassed in and a wooden plug is made for the moulding that will cover the top of the centreplate case.

First, wooden bulkheads were bonded into the keel each end of where the ballast castings were to be fitted. These would contain the resin poured into the keel to bond the castings in place. With the resin poured in, the castings were lowered into position, squeezing the resin up the sides of the keel to ensure that no voids remained. More resin was poured on top of the castings to a level just below the cabin sole, and also into the bilge keels to make them solid and more resistant to damage. Finally the resin was glassed over.

The interior moulding

While the deck was being laid up, so was the interior moulding. It's a complex shape, with lots of details and contours, so the laminators had to make sure they worked the resin well into all the corners. Plywood was glassed in to stiffen flat areas of the sole (such as in the heads) and to

reinforce the moulding where the release plates will be wound down. The plates can apply a substantial force and it's important the moulding isn't damaged or distorted. Plywood was also bonded in athwartships to enclose the lockers. Released from its mould, the interior was then cut into two sections. One formed the forecabin, forward of the main bulkhead; the other the rest of the accommodation from the main bulkhead aft. After the ballast was fitted, the forward section was lowered into the hull and the main bulkhead positioned. Many builders use one-piece interior mouldings incorporating a landing into which the main bulkhead is bonded – so the bulkhead is bonded to the interior moulding, which in turn is bonded to the hull. Crabbers, however, prefer the belt-and-braces approach, bonding the main bulkhead directly to the hull. They laminate it both sides as well, and then bond each section of the interior moulding to it. The anchor-

well bulkhead was also fitted at this stage. The two sections of the interior moulding are first dry-fitted and marked around with a pen on the inside of the hull. Then they're lifted out and bonding paste is applied to the contact areas before the final fitting takes place.

Fitting out

With the principal structures – except the deck – in position, it was time to press on with the fit-out: installing the engine and stern gear, flow-coating the hull inside the lockers (painting with gel coat – normally done before the interior mouldings go in) and putting the deck on again to make stick templates for the remaining full-height bulkheads. Meanwhile, a plug was made for the rudder, the spars and rigging arrived and so did the centreplate. At this stage, the first boat was only about three weeks away from being launched.

The interior moulding



Laying up the interior moulding. The raised areas on the flat surfaces will be cut out of the completed moulding and replaced by wooden locker lids



Plywood pads ready to be glassed in. Some are to stiffen areas of the sole, others to provide reinforcement in way of the release plates so the moulding isn't damaged when the plates are wound down



The completed interior moulding, with plywood stiffening glassed in as well as the athwartships locker-dividers



Here the interior moulding has been cut in two and the forward section dry-fitted into the hull together with the anchor-well and main bulkheads. It has been designed to allow a toilet to fit between the berths



Now it's the turn of the aft section of the interior moulding to be lowered into the hull...



... and carefully fitted into position

Fitting out



Fit-out is under way and the engine's going in



Another test-fit of the deck with the interior partly fitted out. Stick templates are made for the heads bulkheads



Designer David Thomas (right) and Peter Thomas of Cornish Crabbers look at the stern gear and the rudder's heel-casting



A plug is made for the transom-hung rudder



The centreplate arrives. Made from 20mm galvanised steel, it weighs 140kg (309lb)

NEXT TIME
The first boat is finally completed and launched. Then it's time to go sailing!

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You can read the first five parts of Birth of a new boat on the PBO website www.pbo.co.uk