



KELVIN HUGHES MARINE NAVIGATION SYSTEMS

PROJECT: Kelvin Hughes Marine Navigation Systems
CLIENT: Kelvin Hughes
DATE: 15 December 2009
DURATION:



PROJECT DETAILS

KELVIN HUGHES is a world leader in the design and manufacture of marine navigation systems and the supply of navigational data including paper and electronic charts and nautical publications. Navigational and tactical display systems from Kelvin Hughes are fitted to ships in more than 30 navies worldwide. From multiple displays and integrated bridge systems in capital ships to specialized systems for submarines Kelvin Hughes can offer solutions for any naval platform. The latest in a whole history of innovation from Kelvin Hughes including the first commercial radar system and the first colour display for radar is SharpEye the first solid state new technology radar system.

Kelvin Hughes are developing a new system which will be fitted onto super yachts and cruise liners. In order to produce a set of prototypes that would be tested both on land and at sea, KH approached Ogle to find a method of manufacturing a small volume (less than 20) of sets of both large & small screen versions. The brief for Ogle was to find a suitable production method for the casings and tracker balls which form one of the interfaces with the screen.

Due to the size of each set and the quantity required it was decided to produce the cases in a PU material that would offer both strength and resilience with acceptable manufacturing tolerances. The 1st stage was to liaise with the very skilled and experienced design engineer at Kelvin Hughes to understand any critical dimensions or features and to ensure that the screen (already a manufactured item) would fit correctly into the bezel. The part needed draft to allow it to easily come out of the tooling that Ogle was designing.

Once Ogle completely understood the customer's specification and had input technical expertise into the prototype design the tools had to be designed. It was decided to use the RIM (Reactive Injection Moulding) process and mould tools had to be designed and then machined out of PU modelboard BM5460.

The data was imported into Ogle's Visions CAM system and cutter paths were generated (with contraction added to allow for RIM material shrinkage) was then fed through to several of Ogle's 3 axis CNC machining centres to start the first roughing cuts to allow the majority of the material to be removed using a large bull nose cutter 20mm dia - once this was complete smaller cutters 6mm dia bull were fitted to give the final detailing and surface finish.

Holes for the risers to allow air venting were machined at this stage.

Using Ogle's skilled workforce the separate parts were then hand finished and assembled using clamps - to ensure that the RIM material once injected did not force the sides of the tool apart.

The tool then had layers of wax and release agent applied to ensure the moulded part would release once the mould was opened.

The tool was then clamped up and the two pack fast reacting PU resin was injected. Once a predetermined amount was applied the tool was left to cure at ambient temperature. Releasing the 1st part proved to be a challenge for the team but once minor adjustments were made (further air holes were machined) they were in a position to start casting parts on a regular basis. Before this occurred we liaised with client and had a test fit of some internal parts and the all important screen, on approval we then got to work. As the parts came off they were then hand finished - a small amount of flash (excess resin) needed to be removed and then off to Ogle's paint finishing department.

Internally a RF shielding coat was applied and following a primer coat an external 2 pack cellulose paint was applied. The colour was to the customer's specification (and had been developed using a range of paint samples or swatches while the tooling was being made).

The parts were delivered to the client who then installed software and began the testing and further development process. Modules were taken out to exhibitions to get feedback and test units were fitted.

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