SCC requirements to a model

1. Model manufacturing

Hull models must be manufactured out of 60 mm thick sheets of Dyvinycell foam of quality 100 kg/m3 (or equivalent PVC foam). Divinycell can be purchased from DIAB or other suppliers of PVC foam.

Since Divinycell ages over time and shrinks, the Divinyell foam must be stored at least for 3 months, preferably for 6 months before manufacturing of a model in order to avoid any deformation of the model. The deformation decreases in time and after 6 months the deformation process has more or less stopped.

The 60 mm foam sheets have to be glued together to a block, from which the model shall be milled. As Divinycell is expensive, it is not recommended to make the block solid. Instead, about 100-150 mm wide waterline beams must be sawed from the foam sheets and glued together.

Polyurethane glue is suitable to be used for gluing the foam sheets together, but requires that the glued sheets are pressed together during curing, since the glue expands during curing.

It is advised to store the model for at least 1 week after the gluing work to avoid further deformation.

2. Milling the model

The outer hull surface must be milled out of the foam block normally placed upside down in a 5 or 3 axis milling machine. After the model has been milled, there must be at least 30 mm thick foam walls left to avoid leakage. The target is to have 50 mm thick walls. The top sheet should be wider or reinforced to make the model longitudinally stiff enough, 80-100 mm wide after milling for a 2.5 m model.

After the surface has been milled, it normally needs some finishing by hand. The surface must be coated by a filler reasonably resistant to water. Normal polyester filler is suitable and has enough water resistance to last during the test period. The model is then painted.

3. Overall accuracy and tolerance

The milled model must be as precise as possible. Just temperature differences may change the overall measures more than 1/10 mm.

Below follows the tolerance recommendations from ITTC "ITTC – Recommended Procedures and Guidelines":

- Model hull tolerances for breadth and depth should be within ± 1.0 mm.
- The tolerance for model length should be within ± 0.05%LPP or ± 1.0 mm whichever is the larger.
- Appendages should be within ± 0.2 mm in overall accuracy. Appendages should be located within ± 0.5 mm of their design position.

4. Surface finish

The model surface should be smooth and equivalent to that achieved with a 300 to 400 grit wet and dry paper.

Particular care should be taken when finishing the model to ensure that geometric features such as knuckles, spray rails, and boundaries of transom sterns remain well-defined, especially where flow separation is to be expected.

Appendages should have equal surface finish to hull and equivalent to that achieved with a 300 to 400 grit wet and dry paper.

5. Spray rails and transom edge

Due to scale effects to the surface tension special attention needs to be paid to spray rails and transom edge, where water or spray should separate form hull surface. The outer edge of the spray rail must be knife sharp without any visible radius. Also the transom edge must be sharp. These details normally require skilled and motivated handcraft labor to maintain accuracy.

6. Painting the model

The model must be painted in a color that gives good contrast to the water surface and has a low gloss to avoid reflection from camera flashes. Yellow is the most common color but also other colors, as blue, work very well. White or grey color should be avoided.

For practical reasons it is convenient to keep the gunwale of the model parallel to baseline, but in reality, the vessels gunwale is most likely not parallel to base line. Therefore, to mark the real gunwale, the surface area above the gunwale line must be painted black.

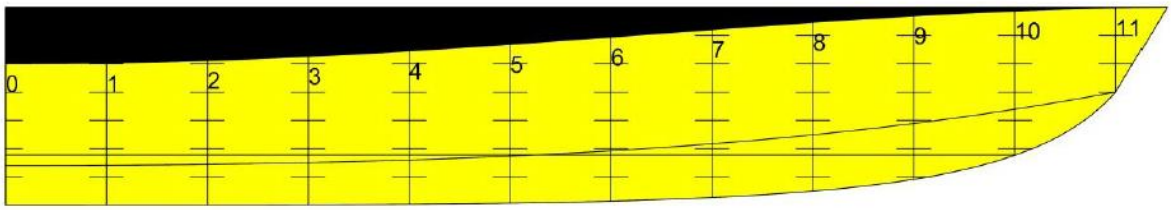

Figure 1 The picture shows an example of painting and marking for a hull model

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